Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

August 19, 2022
NOC-AE-22003912
10 CFR 20.2002
STI: 35353041

Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498 and STN 50-499
STPNOC Response to Request for Additional Information Regarding
Request for Approval of Alternate Disposal Procedures for
Very Low-Level Radioactive Material (EPID: L 2021-LLL-0022)

References:

1. Letter from K. Harshaw, STPNOC; to B. Pham, NRC; “Response to End of Enforcement Discretion and Request for Approval of Alternate Disposal Procedures for Very Low-Level Radioactive Material;” November 4, 2021; NOC-AE-21003846; ML21308A603.

2. Letter from K. Harshaw, STPNOC; to B. Pham, NRC; “Revised Response to End of Enforcement Discretion and Request for Approval of Alternate Disposal Procedures for Very Low-Level Radioactive Material (EPID: L-2021-LLL-0022);” December 3, 2021; NOC-AE-21003853; ML21337A126.

3. Email from D. Galvin, NRC; to W. Brost, STPNOC; “South Texas Project - Request for Additional Information – 10 CFR 20.2002 Alternate Disposal Request;” July 20, 2022; AE-NOC-22003343; ML22206A014.

4. Letter from M. Murray, STPNOC; to B. Holian, NRC; “STPNOC Agreement for Disposal of Very Low-Level Radioactive Material;” August 14, 2018; NOC-AE-18003591; ML18226A352.

5. Letter from R. Gangluff, STPNOC; to S. Jablonski, TCEQ; "Exemption of Waste Streams Containing Trace Quantities of Radioactive Material;" March 5, 2008; NOC-TX-08017813.

6. Letter from H. Weger, TCEQ; to R. Gangluff, STPNOC; "Exemption Concurrence Request Log No. 2007-11-0007;" March 7, 2008; TX-NOC-08018077.

STP Nuclear Operating Company (STPNOC) submitted a request to the NRC for approval of STPNOC's current practices for disposal of very low-level radioactive material as alternate disposal procedures per 10 CFR 20.2002 (References 1 and 2). The NRC reviewed the submittal and provided additional questions by email on July 20, 2022 (Reference 3). Attachment 1 provides the STPNOC response to these requests for additional information (RAIs).

While the RAI responses contained in Attachment 1 and the earlier correspondence related to STPNOC's 10 CFR 20.2002 Alternate Disposal Request provide information related to the current disposal site, STPNOC requests NRC approval to use any Class 1 or Class 2 industrial landfill in the State of Texas to dispose of the subject very low-level radioactive material. The exempt material limits and disposal site permitting criteria are described in Texas Administrative Code requirements.

There are no commitments in this letter.

If there are any questions regarding this letter, please contact Zachary Dibbern at (361) 972-4336 or me at (361) 972-4778.

I declare under penalty of perjury that the foregoing is true and correct

Executed on 8/19/2022

Kimberly A. Harshaw
Executive VP and CNO

Attachments:
1. Response to Requests for Additional Information for Approval of Alternate Disposal Procedures for Very Low-Level Radioactive Material
2. RESRAD Summary Report for Onsite of the Generic Landfill

cc:
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Attachment 1

Response to Requests for Additional Information for Approval of Alternate Disposal Procedures for Very Low-Level Radioactive Material

Response to Requests for Additional Information for Approval of Alternate Disposal Procedures for Very Low-Level Radioactive Material

The STPNOC responses to the NRC RAIs are included below. Note that the references and information related to Texas Administrative Code (TAC) requirements are current as of the date of this letter, but they are controlled by the State of Texas and are subject to change under their authority. Also note, the terms very low-level waste (VLLW) and very low-level radioactive material may be used interchangeably in this response, however, they refer to the same material.

RAI-1

a. *Provide specific details regarding the volume of material expected for each shipment, the length of time STP plans to perform the proposed action (the current license is through 2048), and the total volume of material to be disposed should this request be approved. The August 14, 2018, letter from STPNOC to the NRC notes that the State of Texas approval does not include a "sunset clause or other time-limiting condition." However, this information is needed to ensure that the proposed disposal action is understood and that specific details pertaining to the description of the waste discussed in 10 CFR 20.2002(a) and the ability to maintain the doses, including future doses, ALARA per 10 CFR 20.2002(d) are considered.*

STP Response:

In the revised STPNOC request for approval of alternate disposal procedures for very low-level radioactive material (Reference 2), STP estimated the average total volume of material for the years 2015 through 2017 to be 153 cubic meters. These years were selected to be consistent with STPNOC's initial 2018 submittal regarding our disposal practices (Reference 4) and is representative of expected waste annual concentrations and amounts. Annual shipment volumes are reported in the STP Annual Radioactive Effluent Release Reports.

Dividing this amount over the three-year period from the beginning of 2015 through the end of 2017 yields an average estimated total annual shipment volume of approximately 51 cubic meters. STP anticipates making between 5 and 12 shipments annually, resulting in a range of 4.25 cubic meters to 10.2 cubic meters per shipment.

The length of time STP plans to perform the proposed action would be through the end of 2078, which is the life of the current license plus an additional 20 years for subsequent license renewal (if sought) and an additional 10 years for decommissioning activities. This is 56 years from the end of 2022.

Using the 56 years and approximate 51 cubic meters per year values yields an estimated total volume of approximately 2,856 cubic meters starting in the year 2023. As this number is based on estimated values and it is not possible to determine the precise total volume of material to be disposed in future years, STPNOC is adding margin to this estimate to increase the total volume anticipated over this period to 5,000 cubic meters.

b. Identify any processes related to the packaging and shipping of the material from STP to the disposal site that differ from the processes already evaluated in the GEIS or the SEIS.

STP Response:

The processes used at STP to package and ship material to the disposal site do not differ from the GEIS or the SEIS processes used for packaging and shipping.

c. *Clarify the anticipated maximum number of annual shipments of material transferred to the disposal site(s). The discussion in the "Proposed Manner and Conditions of Disposal" section of the submittal notes that STPNOC performs five shipments per year, on average. However, in the "Dose Analyses – Annual Dose to a Material Shipment Driver" section of the submittal STPNOC assumes that 12 shipments are made annually. Also, clarify the statement "[w]aste must be received and interred by the end of business on the date received," and clarify the length of time between when the material is packaged and shipped until it received and interred. Also clarify whether individual shipments will contain the same material or a mixture of different material types, the method used to transport the material (e.g., trucks, trains, etc.), and the method for tracking and documenting which materials were shipped to specific landfills.*

STP Response:

STPNOC used different numbers of anticipated annual shipments in our earlier responses to show a 'worst case' for different scenarios. While we anticipated an average of five shipments per year, we conservatively raised that number to a maximum of 12 shipments in the evaluation of dose to a material shipment driver because this would result in a greater dose impact if the same driver were to perform all 12 shipments. In this 'worst case' calculation example, STP used the total yearly annual average activity from 2015 through 2017 and divided it equally among twelve months to calculate a monthly activity per shipment.

The estimated waste parameters and annual nuclide activity per volume for each shipment is described in Table 1 and Table 2 of the revised STPNOC request for approval of alternate disposal procedures for very low-level radioactive material (Reference 2), copied below. STPNOC does not anticipate doses from future annual totals to exceed the dose from the summed annual averages disposed of in 2015 through 2017. These radionuclide activities are a small fraction of the activity limits listed in TAC Title 25 Rule 289.251, "Exemptions, General Licenses, and General License Acknowledgements."

Table 1
Waste Parameters

Waste Volume	153 meters^3	**Area**	1004 meters^2
Thickness of slab	0.1524 meters	**Length**	167 meters
Cover depth	0.1524 meters	**Width**	6 meters

Table 2
Waste Activity and Characteristics for Dose Evaluation
VLLW Quantities of Activity Per Volume (pico-curies/gram)

Nuclides	2015	2016	2017	3-Year Total
^{3}H - Tritium	0	2.60E+00	1.14E-01	2.71E+00
^{63}Ni - Nickel-63	0	0	2.60E-02	2.60E-02
^{60}Co - Cobalt-60	1.07E-02	2.09E-02	3.57E-02	6.73E-02
^{7}Be - Berylium-7	0	1.92E-02	0	1.92E-02
^{55}Fe - Iron-55	0	0	4.41E-02	4.41E-02
^{137}Cs -Cesium-137	0	1.19E-03	1.59E-03	2.79E-03
Totals	1.07E-02	2.64E+00	2.22E-01	2.87E+00

Individual shipments may contain a mixture of different material types such as resin, sludge, or soil, however, the material will all be packaged and shipped using the same processes and procedures at STP for transportation for all shipments. These may be shipped in B-25 boxes, 55-gallon drums, or in vacuum trucks, but shipments will always be by truck.

STPNOC verifies that the activity levels and amounts of exempt quantity waste shipments meet the requirements and conditions specified in the TCEQ's determination prior to shipment.

Class 1 and 2 waste has no limit to the time it can be stored onsite and therefore the length of time onsite is not specified. The amount of time between when the material is packaged and shipped until it is received and interred depends on the distance of the facility from the STP Electric Generating Station (STPEGS) site. The current disposal site is estimated to be no more than a three hour drive from STPEGS.

The statement regarding waste needing to be interred by the end of the business day was an operational practice of the current facility. Guidelines for landfill cover at the disposal facility are contained in TAC Title 30 Rule 330.165.

d. *Describe any alternatives to disposing of the material at Texas Class I or Class II landfills that were considered (e.g., treatment methods, disposal onsite at STP or at licensed low-level waste disposal sites, disposal in landfills outside the State of Texas, etc.) and provide the bases for why such alternatives were or were not considered reasonable.*

STP Response:

As an alternative, STPNOC considered shipping the very low-level radioactive material to Resource Conservation and Recovery Act (RCRA) facilities as well as a Part 61 facilities in Texas. However, these options would have resulted in substantially increased cost as well as increased dose to drivers and transportation risk due to a longer travel distance with no additional safety benefit. This option was not selected.

A no-action option of storing the low-level radioactive material onsite was not practical as STP has a limited onsite storage capacity available to accommodate the material. This option was not selected.

Disposal in facilities outside of Texas is not allowed by the current STP agreement with the State of Texas.

RAI-2

a. *Identify the criteria and characteristics used by the State of Texas to classify a specific disposal site as a Texas Class 1 or Class 2 landfill that is acceptable for receiving and disposing of the VLLW material sent from STP or identify specific characteristics of specific site(s) the STP may use for waste disposal during the remainder of the current operating license period, or an alternate period consistent with the duration of the alternate disposal request. Also identify the range of environmental settings (e.g., urban, suburban, rural, etc.) for these disposal site(s) and how the environmental setting impacts their classification as a Texas Class 1 or Class 2 landfill.*

STP Response:

STPNOCs current agreement with the State of Texas allows STP to dispose of exempt quantities of very low-level radioactive material to any Class 1 or Class 2 industrial landfills in the State of Texas (References 5 and 6). STPNOC currently ships to a Class 1 landfill. The State of Texas regulates the criteria and characteristics used by Class 1 or Class 2 landfills through the Texas Administrative Code. The Texas Commission on Environmental Quality (TCEQ) classifies and permits municipal solid waste facilities according to their method(s) of processing or disposal.

Texas Class 1 and Class 2 landfills are required to follow the municipal solid waste regulations of TAC Title 30, Part 1, Chapter 330, "Municipal and Solid Waste". Class 1 landfills are authorized to accept all types of municipal solid waste. For information, Class 1 and Class 2 wastes and landfills are defined in the TAC as:

TAC Title 30 Rule 330.3(21), "Class 1 wastes"
Any industrial solid waste or mixture of industrial solid wastes that because of its concentration, or physical or chemical characteristics is toxic, corrosive, flammable, a strong sensitizer or irritant, a generator of sudden pressure by decomposition, heat, or other means, or may pose a substantial present or potential danger to human health or the environment when improperly processed, stored, transported, or disposed of or otherwise managed…

Determination criteria for Class 1 waste is contained in TAC Title 30 Rule 335.505.

TAC Title 30 Rule 330.3(22), "Class 2 wastes"
Any individual solid waste or combination of industrial solid waste that are not described as Hazardous, Class 1, or Class 3…

Determination criteria for Class 2 waste is contained in TAC Title 30 Rule 335.506.

TAC Title 30 Rule 330.3(77), "Landfills"
A solid waste management unit where solid waste is placed in or on land and which is not a pile, a land treatment unit, a surface impoundment, an injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

Landfills in Texas are permitted by the TCEQ and must be designated by the TCEQ under TAC Title 30 Rule 330.5 to accept Class 1 or 2 industrial waste. Permitted Texas Class 1 and Class 2 disposal sites are located in a variety of environmental settings including urban, suburban, and rural locations. Environmental conditions, settings, and impacts are included in the permitting process to ensure public safety and minimize environmental impacts.

TAC Title 30 Rule 330.57(c) specifies the required components of the permitting application including:
- existing conditions and character of the facility and surrounding area,
- information relating to land-use compatibility under the provisions of Texas Health and Safety Code,
- design information and required plans, and
- the site operating plan that discusses how the owner or operator plans to conduct daily operations at the facility.

Further, permit applications approved by the State of Texas must contain sufficient information to provide assurance that operation of the site will pose no reasonable probability

of adverse effects on the health, welfare, environment, or physical property of nearby residents or property owners per TAC Title 30 Rule 330.57(d). Active permitted landfills in Texas can be located using the TCEQ Central Registry.

b. *Describe the processes associated with the disposal of the material at Texas Class 1 and Class 2 disposal site(s) that are protective of the workers and members of the public at the landfills and in the areas surrounding the landfills. If specific Texas Class 1 and Class 2 disposal sites are being proposed for consideration, describe the processes and safety measures taken by those specific sites to ensure the safety of the workers and members of the public at the landfills and in the surrounding areas.*

STP Response:

Landfills are required to follow stringent requirements in TAC Title 30 Chapter 330 for disposal of approved wastes including drainage (Subchapter G), liner system design and operation (Subchapter H), gas management (Subchapter I), groundwater sampling and monitoring (Subchapter J), location restrictions (Subchapter M), and closure and post-closure requirements (Subchapters K and L). Compliance with these TAC requirements is enforced by the TCEQ. The regulations for groundwater sampling and landfill liner and leachate collection requirements are not only intended to protect the public but also the land and wildlife.

Additionally, TAC Title 30 Rule 330.131, “Access Control,” requires control of public access by means of artificial barriers, natural barriers, or a combination of both, appropriate to protect human health and safety and the environment. The permitted site’s operating plan must also include an inspection and maintenance schedule, State notification in the event of a breach, as well as provisions for temporary and permanent repairs. The breach must be temporarily repaired within 24 hours of detection.

In addition to the requirements set in TAC Title 30 Chapter 330, landfill workers and the members are the public are protected from sources of radioactive material by TAC Title 25 Rule 289.202, “Standards for Protection Against Radiation from Radioactive Materials.”

TAC Title 25 Rule 289.251(e)(2), “Exempt quantities,” provides guidance and list requirements for control of radioactive materials in amounts below the exempt quantities of radioactive material listed in TAC Title 25 Rule 289.251(l)(2) that are safe for disposal. STP ensures that all shipments of very low-level radioactive material are below the “Exempt quantities” limits.

Once a landfill is closed, there are regulations for final cover systems listed in TAC Title 30 Chapter 330, Subchapter K that continue to ensure the protection of members of the public.

c. *Describe the environmental impacts associated with this alternate disposal request. When considering impacts associated with onsite activities STPNOC may use existing environmental analyses, if appropriate, including the GEIS and SEIS, and consider how disposal processes that have already been evaluated compare to the proposed disposal procedures. For activities occurring offsite, describe any environmental impacts specifically associated with the disposal of VLLW at Texas Class 1 and Class 2 disposal sites. If specific Texas Class 1 and Class 2 disposal sites are being proposed, describe any environmental impacts specifically associated with the disposal of VLLW at these sites. STPNOC should consider any new or additional information related to environmental resources not previously considered by the NRC since the publication of the SEIS. Specific considerations should*

include impacts to prominent vegetation, wildlife, aquatic habitats, and biota, as well as federally listed species and critical habitats protected under the Endangered Species Act.

STP Response:

The environmental impacts associated with onsite activities are documented in our STP UFSAR, ODCM, site conceptual model, Annual Environmental Operating Report (AEOR), and Annual Radioactive Effluent Release Report (ARERR). There is no difference between the currently evaluated and proposed disposal procedures.

The STPNOC alternate disposal request is for any approved Class 1 or Class 2 disposal sites in the State of Texas, therefore providing site specific environmental review data is not practical. Permitted Texas Class 1 and Class 2 disposal sites are located in a variety of environmental settings including urban, suburban, and rural locations. Per permitting requirement TAC Title 30 Rule 330.61(h), “Impact on Surrounding Area”, site permit applicants must show that the use of any land for a municipal solid waste facility does not adversely impact human health or the environment, providing information regarding likely impacts of the facility on cities, communities, groups, and individuals.

Potential impacts to land use (TAC Title 30 Rule 330.61(g), “Land-use map”), geology, and soils (TAC Title 30 Rule 330.61(j), “General geology and soils statement”) are controlled by the applicable Texas Administrative Codes.

Potential impacts to ecological resources such as vegetation, wildlife, aquatic habitats, biota, and endangered species are likewise controlled by TAC permitting requirements for Class 1 or Class 2 facilities. For example, see TAC Title 30 Rule 330.157, “Endangered Species Protection”, TAC Title 30 Rule 330.61(n), “Endangered or Threatened Species”, TAC Title 30 Rule 330.23(h), “Relationships with Other Governmental Entities”, TAC Title 30 Rule 330.61(m), “Floodplains and wetlands statement.”

Disposal sites permitted by the State of Texas must provide assurance that operation of the site will pose no reasonable probability of adverse effects on the health, welfare, environment, or physical property of nearby residents or property owners per TAC Title 30 Rule 330.57(d).

Overall, both onsite and offsite environmental impacts are expected to be small and are not likely to adversely affect ecological resources.

d. *Identify the Federal, State, and local regulations that would be used to ensure that industrial landfills accepting VLLW are safe and that surrounding areas are not impacted. Also identify any other Federal, State, and local permits and approvals that are needed or have been already obtained in connection with the proposed action.*

STP Response:

Applicable State of Texas regulations that would be used to ensure that landfills accepting VLLW are safe and that surrounding areas are not impacted include:
- TAC Title 30 Chapter 330
- TAC Title 25 Chapter 289
- TAC Title 30 Chapter 335

Federal regulations include:
- Title 40 Code of Federal Regulation Part 258, Criteria for Municipal Solid Waste Landfills

STPNOC has an existing agreement with the State of Texas to dispose of very low-level radioactive material in Class 1 or Class 2 industrial landfills in Texas (References 5 and 6). In this 2008 determination, the Texas Commission on Environmental Quality (TCEQ) concluded the specified waste streams containing trace quantities of radioactive material are exempt under the relevant provisions of the Texas Administrative Code (TAC) and could be disposed of in a Texas Class 1 or 2 industrial landfill.

RAI-3

a. *Provide a summary of the input parameters for the sites being considered for disposal under the requested action and resulting doses from the RESRAD [RESidual RADioactive]-ONSITE and RESRAD–OFFSITE analyses (these could be the summary reports) as well as any other technical analyses performed for this submittal. Also provide the basis for considering specific modeling assumptions used in these calculations.*

STP Response:

See Attachment 2, RESRAD Summary Report for Onsite of the Generic Landfill, for the input parameters. The basis for the specific modeling assumptions were developed from a generic landfill based in Southeast Texas. The parameters for disposal of waste at this generic site were used, and from these parameters conservative assumptions were used to demonstrate compliance. Any landfill used for disposal of the very low-level radioactive waste would be analyzed to meet these bases.

For activities occurring offsite, RESRAD calculations were performed to verify anticipated dose to a member of the public, landfill workers, and drivers were below 5 mrem per year, which is lower than the minimum of 100 mrem/hr required in 10 CFR 20.1301. Specific considerations were incorporated into RESRAD where appropriate for local pathways. Overall, potential dose and health impacts to the public and to workers from the disposal activities are expected to be small and maintained ALARA.

b. Clarify the different workers involved with these disposal actions, the number of workers associated with each task, whether workers may perform multiple tasks associated with the proposed action, and if additional workers are necessary. Clarify whether the actions related to packaging and preparing the shipments at STP are performed by qualified radiation workers, members of the public, or someone else and whether any radiation exposure monitoring activities are performed.

STP Response:

The different workers involved with the disposal actions include STP radiation workers and environmental technicians onsite, material shipment drivers, and workers at the offsite disposal facilities.

Actions relating to packaging and preparing of shipments onsite at STP are performed only by qualified radiation workers. STPNOC has implemented a radiation protection program for radiation workers that incorporates ALARA limits and satisfies the radiation protection requirements in 10 CFR 20, “Standards for Protection Against Radiation.”

Basic TAC requirements for workers at offsite disposal facilities are listed in TAC Title 30 Chapter 330. Specifically, per TAC Title 30 Rule 330.127, “Site Operating Plan”, a description of the functions and minimum qualifications for each category of key personnel employed at the permitted offsite disposal facilities as well as a description of the general instructions followed by operating personnel must be provided as part of the permitting process and retained through the life of the facility.

c. *Clarify the statement in the section, “Dose Analyses – Annual Dose to a Material Shipment Driver” that each shipment is assumed to be one-twelfth of an annual activity of 2.00E-05 curies of Cobalt 60 (Co-60). Explain the origin of the 2.00E-05 curie value as it is well below the Co-60 values provided in Table 2 of the submittal and why a fraction of Co-60 is considered but no other radionuclides are being considered for disposal.*

STP Response:

The 2.00E-5 Curie value is a conservative activity estimate that we used in our point source calculation to estimate driver dose. This estimate was derived from the estimated waste volume of 153 cubic meters and the radionuclide waste activity values in Table 2 of the of the revised STPNOC request for approval of alternate disposal procedures for very low-level radioactive material (Reference 1). The activity of all nuclides, minus tritium, were summed and then this summed value was assumed to consist of only Co-60 to represent activity in a point source calculation. Co-60 was selected for conservatism because it represents the worst case for external exposure. The Tritium activity was excluded from the point source calculation because it would not contribute any external dose hazard.

In this point source calculation, no shielding was assumed for conservative purposes. The point source calculation produced a dose rate which was then used to calculate an annual dose. The table below shows the total summed activity for all identified nuclides except for Tritium activity. The resulting calculated annual dose value is much lower than the annual limit of 100 mrem for a member of the public as stated in 10 CFR 20.1301.

Assume Point Source No Shielding			
Total Activity Shipped in 1-year=	2.00E-05	Curies of ^{60}**Co**	
Gamma ray constant for ^{60}Co=	1.32	Γ=R*m2/Hours*Ci	
Assume 12 shipments/year=	1.67E-06	Curies per shipment	
Assume Driver is 2-m from source	2	meters from source	
	3	hours per trip	
	36	hours per year	
Dose Rate at one meter=	2.20E-06	R/hour	
Driver DR from inverse square=	5.50E-07	R/hour at 2-METERS	
Drive Dose per trip=	1.65E-03	**millirem**	
Annual Driver Dose	1.98E-02	**millirem**	

Attachment 2

RESRAD Summary Report for Onsite of the Generic Landfill

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Co-58 (Source: DCFPAK3.02)	5.604E+00	5.604E+00	DCF1(1)
A-1	Co-60 (Source: DCFPAK3.02)	1.539E+01	1.539E+01	DCF1(2)
A-1	Cr-51 (Source: DCFPAK3.02)	1.633E-01	1.633E-01	DCF1(3)
A-1	Fe-55 (Source: DCFPAK3.02)	6.146E-10	6.146E-10	DCF1(4)
A-1	Mn-54 (Source: DCFPAK3.02)	4.857E+00	4.857E+00	DCF1(5)
A-1	Nb-95 (Source: DCFPAK3.02)	4.408E+00	4.408E+00	DCF1(6)
A-1	Nb-95m (Source: DCFPAK3.02)	3.026E-01	3.026E-01	DCF1(7)
A-1	Ni-63 (Source: DCFPAK3.02)	0.000E+00	0.000E+00	DCF1(8)
A-1	Zr-95 (Source: DCFPAK3.02)	4.203E+00	4.203E+00	DCF1(9)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Co-58	8.658E-06	8.658E-06	DCF2(1)
B-1	Co-60	1.221E-04	1.221E-04	DCF2(2)
B-1	Cr-51	1.606E-07	1.606E-07	DCF2(3)
B-1	Fe-55	3.341E-06	3.341E-06	DCF2(4)
B-1	Mn-54	1.332E-05	1.332E-05	DCF2(5)
B-1	Nb-95	7.141E-06	7.141E-06	DCF2(6)
B-1	Ni-63	8.251E-06	8.251E-06	DCF2(7)
B-1	Zr-95+D	2.768E-05	2.398E-05	DCF2(8)
B-1	Zr-95+D1	2.401E-05	2.398E-05	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Co-58	3.737E-06	3.737E-06	DCF3(1)
D-1	Co-60	2.031E-05	2.031E-05	DCF3(2)
D-1	Cr-51	1.861E-07	1.861E-07	DCF3(3)
D-1	Fe-55	2.039E-06	2.039E-06	DCF3(4)
D-1	Mn-54	3.293E-06	3.293E-06	DCF3(5)
D-1	Nb-95	2.775E-06	2.775E-06	DCF3(6)
D-1	Ni-63	7.326E-07	7.326E-07	DCF3(7)
D-1	Zr-95+D	7.748E-06	4.662E-06	DCF3(8)
D-1	Zr-95+D1	4.693E-06	4.662E-06	DCF3(9)
D-34	Food transfer factors:			
D-34	Co-58 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(1,1)
D-34	Co-58 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(1,2)
D-34	Co-58 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(1,3)
D-34				
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(2,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(2,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(2,3)
D-34				
D-34	Cr-51 , plant/soil concentration ratio, dimensionless	2.500E-04	2.500E-04	RTF(3,1)
D-34	Cr-51 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	9.000E-03	9.000E-03	RTF(3,2)
D-34	Cr-51 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(3,3)
D-34				
D-34	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(4,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(4,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Mn-54 , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(5,1)
D-34	Mn-54 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-04	5.000E-04	RTF(5,2)
D-34	Mn-54 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(5,3)
D-34				
D-34	Nb-95 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Nb-95 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(6,2)
D-34	Nb-95 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(6,3)
D-34				
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(7,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(7,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(7,3)
D-34				
D-34	Zr-95+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Zr-95+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-06	1.000E-06	RTF(8,2)
D-34	Zr-95+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-07	6.000E-07	RTF(8,3)
D-34				
D-34	Zr-95+D1 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Zr-95+D1 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,2)
D-34	Zr-95+D1 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-07	6.000E-07	RTF(9,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Co-58 , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Co-58 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(1,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(2,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(2,2)
D-5				
D-5	Cr-51 , fish	2.000E+02	2.000E+02	BIOFAC(3,1)
D-5	Cr-51 , crustacea and mollusks	2.000E+03	2.000E+03	BIOFAC(3,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(4,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(4,2)
D-5				
D-5	Mn-54 , fish	4.000E+02	4.000E+02	BIOFAC(5,1)
D-5	Mn-54 , crustacea and mollusks	9.000E+04	9.000E+04	BIOFAC(5,2)
D-5				
D-5	Nb-95 , fish	3.000E+02	3.000E+02	BIOFAC(6,1)
D-5	Nb-95 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(6,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(7,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Zr-95+D , fish	3.000E+02	3.000E+02	BIOFAC(8,1)
D-5	Zr-95+D , crustacea and mollusks	6.700E+00	6.700E+00	BIOFAC(8,2)
D-5				
D-5	Zr-95+D1 , fish	3.000E+02	3.000E+02	BIOFAC(9,1)
D-5	Zr-95+D1 , crustacea and mollusks	6.700E+00	6.700E+00	BIOFAC(9,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.

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)	1.954E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	5.000E-02	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+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)	2.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E+00	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E+00	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E+00	1.000E+02	---	T(6)
R011	Times for calculations (yr)	1.000E+01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	2.000E+01	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): Co-58	1.840E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Co-60	1.620E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cr-51	1.840E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Fe-55	5.730E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Mn-54	1.670E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Ni-63	1.230E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): Zr-95	2.000E-01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Co-58	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cr-51	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Fe-55	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Mn-54	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): Zr-95	not used	0.000E+00	---	W1(8)
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)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
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)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+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	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	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)	1.500E+00	1.500E+00	---	DENSAQ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+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)	1.000E+01	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)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+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	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Co-58				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.665E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.665E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cr-51				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.206E-01	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Fe-55				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(4)
R016	Unsaturated 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	6.665E-03	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 Mn-54				
R016	Contaminated zone (cm**3/g)	2.000E+02	2.000E+02	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+02	2.000E+02	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	2.000E+02	2.000E+02	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.330E-02	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.665E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for Zr-95				
R016	Contaminated zone (cm**3/g)	2.200E+03	2.200E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	2.200E+03	2.200E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	2.200E+03	2.200E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.030E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Nb-95				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.116E+01	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	1.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-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)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+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)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+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	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.977E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.977E+00	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	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)	1.600E+02	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	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)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
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)
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	suppressed

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	19540.00 square meters	Co-58	1.840E+00
Thickness:	0.05 meters	Co-60	1.620E+00
Cover Depth:	0.00 meters	Cr-51	1.840E+00
		Fe-55	5.730E+00
		Mn-54	1.670E+00
		Ni-63	1.230E+00
		Zr-95	2.000E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 2.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	1.000E+01	2.000E+01
TDOSE(t):	9.414E+00	6.553E+00	5.302E+00	4.426E+00	3.749E+00	3.199E+00	1.483E+00	3.129E-01
M(t):	3.766E-01	2.621E-01	2.121E-01	1.770E-01	1.500E-01	1.279E-01	5.932E-02	1.251E-02

Maximum TDOSE(t): 9.414E+00 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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	8.775E-01	0.0932	9.832E-08	0.0000	0.000E+00	0.0000	7.195E-04	0.0001	1.075E-03	0.0001	1.375E-04	0.0000	1.695E-05	0.0000
Co-60	6.712E+00	0.7130	4.179E-06	0.0000	0.000E+00	0.0000	1.178E-02	0.0013	1.763E-02	0.0019	2.254E-03	0.0002	2.777E-04	0.0000
Cr-51	1.146E-02	0.0012	7.199E-10	0.0000	0.000E+00	0.0000	4.572E-08	0.0000	3.407E-06	0.0000	1.102E-06	0.0000	3.333E-07	0.0000
Fe-55	1.344E-09	0.0000	3.814E-07	0.0000	0.000E+00	0.0000	4.967E-05	0.0000	2.142E-03	0.0002	4.666E-05	0.0000	9.297E-05	0.0000
Mn-54	1.691E+00	0.1797	3.401E-07	0.0000	0.000E+00	0.0000	5.347E-03	0.0006	1.483E-04	0.0000	1.080E-04	0.0000	3.359E-05	0.0000
Ni-63	0.000E+00	0.0000	2.279E-07	0.0000	0.000E+00	0.0000	2.143E-04	0.0000	9.726E-05	0.0000	5.097E-04	0.0001	8.085E-06	0.0000
Zr-95	7.866E-02	0.0084	2.856E-08	0.0000	0.000E+00	0.0000	2.361E-06	0.0000	2.806E-09	0.0000	3.033E-09	0.0000	2.346E-06	0.0000
Total	9.371E+00	0.9955	5.256E-06	0.0000	0.000E+00	0.0000	1.811E-02	0.0019	2.109E-02	0.0022	3.057E-03	0.0003	4.320E-04	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 = 0.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.795E-01	0.0934
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	6.744E+00	0.7164
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.147E-02	0.0012
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.332E-03	0.0002
Mn-54	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.697E+00	0.1803
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.296E-04	0.0001
Zr-95	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.866E-02	0.0084
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	9.414E+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 = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	2.418E-02	0.0037	2.687E-09	0.0000	0.000E+00	0.0000	1.968E-05	0.0000	2.944E-05	0.0000	3.762E-06	0.0000	4.633E-07	0.0000
Co-60	5.776E+00	0.8815	3.566E-06	0.0000	0.000E+00	0.0000	1.005E-02	0.0015	1.505E-02	0.0023	1.924E-03	0.0003	2.370E-04	0.0000
Cr-51	9.757E-07	0.0000	6.076E-14	0.0000	0.000E+00	0.0000	3.915E-12	0.0000	2.908E-10	0.0000	9.333E-11	0.0000	2.814E-11	0.0000
Fe-55	1.027E-09	0.0000	2.882E-07	0.0000	0.000E+00	0.0000	3.753E-05	0.0000	1.619E-03	0.0002	3.526E-05	0.0000	7.024E-05	0.0000
Mn-54	7.182E-01	0.1096	1.432E-07	0.0000	0.000E+00	0.0000	2.253E-03	0.0003	6.258E-05	0.0000	4.556E-05	0.0000	1.415E-05	0.0000
Ni-63	0.000E+00	0.0000	2.203E-07	0.0000	0.000E+00	0.0000	2.072E-04	0.0000	9.406E-05	0.0000	4.928E-04	0.0001	7.815E-06	0.0000
Zr-95	1.518E-03	0.0002	5.389E-10	0.0000	0.000E+00	0.0000	4.749E-08	0.0000	5.715E-11	0.0000	5.930E-11	0.0000	4.454E-08	0.0000
Total	6.520E+00	0.9951	4.221E-06	0.0000	0.000E+00	0.0000	1.257E-02	0.0019	1.685E-02	0.0026	2.501E-03	0.0004	3.297E-04	0.0001

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.423E-02	0.0037
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	5.804E+00	0.8857
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.762E-07	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.762E-03	0.0003
Mn-54	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.206E-01	0.1100
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.021E-04	0.0001
Zr-95	1.686E-07	0.0000	4.869E-09	0.0000	0.000E+00	0.0000	1.055E-08	0.0000	3.779E-13	0.0000	1.147E-11	0.0000	1.518E-03	0.0002
Total	1.686E-07	0.0000	4.869E-09	0.0000	0.000E+00	0.0000	1.055E-08	0.0000	3.779E-13	0.0000	1.147E-11	0.0000	6.553E+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 = 2.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	6.661E-04	0.0001	7.340E-11	0.0000	0.000E+00	0.0000	5.377E-07	0.0000	8.042E-07	0.0000	1.028E-07	0.0000	1.266E-08	0.0000
Co-60	4.970E+00	0.9374	3.042E-06	0.0000	0.000E+00	0.0000	8.576E-03	0.0016	1.284E-02	0.0024	1.641E-03	0.0003	2.022E-04	0.0000
Cr-51	8.304E-11	0.0000	5.127E-18	0.0000	0.000E+00	0.0000	3.303E-16	0.0000	2.454E-14	0.0000	7.875E-15	0.0000	2.374E-15	0.0000
Fe-55	7.840E-10	0.0000	2.176E-07	0.0000	0.000E+00	0.0000	2.835E-05	0.0000	1.223E-03	0.0002	2.663E-05	0.0000	5.305E-05	0.0000
Mn-54	3.049E-01	0.0575	6.030E-08	0.0000	0.000E+00	0.0000	9.482E-04	0.0002	2.634E-05	0.0000	1.918E-05	0.0000	5.955E-06	0.0000
Ni-63	0.000E+00	0.0000	2.129E-07	0.0000	0.000E+00	0.0000	2.002E-04	0.0000	9.088E-05	0.0000	4.761E-04	0.0001	7.551E-06	0.0000
Zr-95	2.867E-05	0.0000	1.009E-11	0.0000	0.000E+00	0.0000	8.896E-10	0.0000	1.070E-12	0.0000	1.111E-12	0.0000	8.342E-10	0.0000
Total	5.275E+00	0.9950	3.533E-06	0.0000	0.000E+00	0.0000	9.753E-03	0.0018	1.418E-02	0.0027	2.163E-03	0.0004	2.687E-04	0.0001

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 2.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.676E-04	0.0001
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	4.993E+00	0.9418
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.307E-11	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.331E-03	0.0003
Mn-54	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.059E-01	0.0577
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.750E-04	0.0001
Zr-95	2.624E-08	0.0000	8.130E-10	0.0000	0.000E+00	0.0000	1.835E-09	0.0000	1.014E-13	0.0000	2.059E-12	0.0000	2.870E-05	0.0000
Total	2.624E-08	0.0000	8.130E-10	0.0000	0.000E+00	0.0000	1.835E-09	0.0000	1.014E-13	0.0000	2.059E-12	0.0000	5.302E+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+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	1.834E-05	0.0000	2.004E-12	0.0000	0.000E+00	0.0000	1.468E-08	0.0000	2.196E-08	0.0000	2.806E-09	0.0000	3.456E-10	0.0000
Co-60	4.275E+00	0.9658	2.593E-06	0.0000	0.000E+00	0.0000	7.312E-03	0.0017	1.095E-02	0.0025	1.399E-03	0.0003	1.724E-04	0.0000
Cr-51	7.064E-15	0.0000	4.324E-22	0.0000	0.000E+00	0.0000	2.786E-20	0.0000	2.070E-18	0.0000	6.641E-19	0.0000	2.002E-19	0.0000
Fe-55	5.984E-10	0.0000	1.643E-07	0.0000	0.000E+00	0.0000	2.140E-05	0.0000	9.230E-04	0.0002	2.010E-05	0.0000	4.005E-05	0.0000
Mn-54	1.294E-01	0.0292	2.537E-08	0.0000	0.000E+00	0.0000	3.990E-04	0.0001	1.109E-05	0.0000	8.070E-06	0.0000	2.506E-06	0.0000
Ni-63	0.000E+00	0.0000	2.056E-07	0.0000	0.000E+00	0.0000	1.933E-04	0.0000	8.777E-05	0.0000	4.598E-04	0.0001	7.292E-06	0.0000
Zr-95	5.413E-07	0.0000	1.890E-13	0.0000	0.000E+00	0.0000	1.666E-11	0.0000	2.004E-14	0.0000	2.080E-14	0.0000	1.562E-11	0.0000
Total	4.404E+00	0.9950	2.989E-06	0.0000	0.000E+00	0.0000	7.926E-03	0.0018	1.197E-02	0.0027	1.887E-03	0.0004	2.222E-04	0.0001

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.838E-05	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	4.295E+00	0.9703
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.067E-15	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.005E-03	0.0002
Mn-54	0.000E+00	0.0000	0.000E+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	0.0293
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.484E-04	0.0002
Zr-95	5.239E-10	0.0000	1.630E-11	0.0000	0.000E+00	0.0000	3.687E-11	0.0000	2.099E-15	0.0000	4.150E-14	0.0000	5.419E-07	0.0000
Total	5.239E-10	0.0000	1.630E-11	0.0000	0.000E+00	0.0000	3.687E-11	0.0000	2.099E-15	0.0000	4.150E-14	0.0000	4.426E+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 = 4.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	5.050E-07	0.0000	5.470E-14	0.0000	0.000E+00	0.0000	4.007E-10	0.0000	5.994E-10	0.0000	7.660E-11	0.0000	9.433E-12	0.0000
Co-60	3.676E+00	0.9804	2.210E-06	0.0000	0.000E+00	0.0000	6.232E-03	0.0017	9.330E-03	0.0025	1.193E-03	0.0003	1.469E-04	0.0000
Cr-51	6.007E-19	0.0000	3.645E-26	0.0000	0.000E+00	0.0000	2.348E-24	0.0000	1.745E-22	0.0000	5.598E-23	0.0000	1.688E-23	0.0000
Fe-55	4.566E-10	0.0000	1.240E-07	0.0000	0.000E+00	0.0000	1.615E-05	0.0000	6.964E-04	0.0002	1.517E-05	0.0000	3.022E-05	0.0000
Mn-54	5.490E-02	0.0146	1.067E-08	0.0000	0.000E+00	0.0000	1.678E-04	0.0000	4.663E-06	0.0000	3.394E-06	0.0000	1.054E-06	0.0000
Ni-63	0.000E+00	0.0000	1.984E-07	0.0000	0.000E+00	0.0000	1.866E-04	0.0000	8.473E-05	0.0000	4.439E-04	0.0001	7.039E-06	0.0000
Zr-95	1.022E-08	0.0000	3.537E-15	0.0000	0.000E+00	0.0000	3.117E-13	0.0000	3.751E-16	0.0000	3.892E-16	0.0000	2.923E-13	0.0000
Total	3.731E+00	0.9950	2.543E-06	0.0000	0.000E+00	0.0000	6.602E-03	0.0018	1.012E-02	0.0027	1.655E-03	0.0004	1.852E-04	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 = 4.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.061E-07	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	3.693E+00	0.9849
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.010E-19	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.581E-04	0.0002
Mn-54	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.508E-02	0.0147
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.225E-04	0.0002
Zr-95	9.860E-12	0.0000	3.067E-13	0.0000	0.000E+00	0.0000	6.941E-13	0.0000	3.955E-17	0.0000	7.813E-16	0.0000	1.023E-08	0.0000
Total	9.860E-12	0.0000	3.067E-13	0.0000	0.000E+00	0.0000	6.941E-13	0.0000	3.955E-17	0.0000	7.813E-16	0.0000	3.749E+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 = 5.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	1.390E-08	0.0000	1.492E-15	0.0000	0.000E+00	0.0000	1.093E-11	0.0000	1.635E-11	0.0000	2.090E-12	0.0000	2.573E-13	0.0000
Co-60	3.160E+00	0.9878	1.883E-06	0.0000	0.000E+00	0.0000	5.308E-03	0.0017	7.948E-03	0.0025	1.016E-03	0.0003	1.251E-04	0.0000
Cr-51	5.107E-23	0.0000	3.071E-30	0.0000	0.000E+00	0.0000	1.979E-28	0.0000	1.470E-26	0.0000	4.717E-27	0.0000	1.422E-27	0.0000
Fe-55	3.482E-10	0.0000	9.348E-08	0.0000	0.000E+00	0.0000	1.218E-05	0.0000	5.253E-04	0.0002	1.144E-05	0.0000	2.279E-05	0.0000
Mn-54	2.329E-02	0.0073	4.485E-09	0.0000	0.000E+00	0.0000	7.054E-05	0.0000	1.960E-06	0.0000	1.427E-06	0.0000	4.430E-07	0.0000
Ni-63	0.000E+00	0.0000	1.915E-07	0.0000	0.000E+00	0.0000	1.801E-04	0.0001	8.175E-05	0.0000	4.283E-04	0.0001	6.791E-06	0.0000
Zr-95	1.928E-10	0.0000	6.616E-17	0.0000	0.000E+00	0.0000	5.830E-15	0.0000	7.016E-18	0.0000	7.280E-18	0.0000	5.467E-15	0.0000
Total	3.183E+00	0.9951	2.172E-06	0.0000	0.000E+00	0.0000	5.571E-03	0.0017	8.557E-03	0.0027	1.457E-03	0.0005	1.552E-04	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+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.393E-08	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	3.174E+00	0.9923
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.109E-23	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.717E-04	0.0002
Mn-54	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.336E-02	0.0073
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.971E-04	0.0002
Zr-95	1.851E-13	0.0000	5.759E-15	0.0000	0.000E+00	0.0000	1.303E-14	0.0000	7.425E-19	0.0000	1.467E-17	0.0000	1.930E-10	0.0000
Total	1.851E-13	0.0000	5.759E-15	0.0000	0.000E+00	0.0000	1.303E-14	0.0000	7.425E-19	0.0000	1.467E-17	0.0000	3.199E+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 = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	2.182E-16	0.0000	2.236E-23	0.0000	0.000E+00	0.0000	1.639E-19	0.0000	2.452E-19	0.0000	3.132E-20	0.0000	3.857E-21	0.0000
Co-60	1.476E+00	0.9950	8.376E-07	0.0000	0.000E+00	0.0000	2.362E-03	0.0016	3.537E-03	0.0024	4.521E-04	0.0003	5.567E-05	0.0000
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	8.931E-11	0.0000	2.263E-08	0.0000	0.000E+00	0.0000	2.947E-06	0.0000	1.271E-04	0.0001	2.768E-06	0.0000	5.516E-06	0.0000
Mn-54	3.179E-04	0.0002	5.840E-11	0.0000	0.000E+00	0.0000	9.186E-07	0.0000	2.554E-08	0.0000	1.858E-08	0.0000	5.768E-09	0.0000
Ni-63	0.000E+00	0.0000	1.588E-07	0.0000	0.000E+00	0.0000	1.494E-04	0.0001	6.782E-05	0.0000	3.553E-04	0.0002	5.632E-06	0.0000
Zr-95	4.586E-19	0.0000	1.503E-25	0.0000	0.000E+00	0.0000	1.325E-23	0.0000	1.594E-26	0.0000	1.654E-26	0.0000	1.242E-23	0.0000
Total	1.476E+00	0.9952	1.019E-06	0.0000	0.000E+00	0.0000	2.515E-03	0.0017	3.732E-03	0.0025	8.101E-04	0.0005	6.682E-05	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+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.187E-16	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	1.482E+00	0.9993
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.384E-04	0.0001
Mn-54	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.189E-04	0.0002
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.782E-04	0.0004
Zr-95	4.286E-22	0.0000	1.334E-23	0.0000	0.000E+00	0.0000	3.018E-23	0.0000	1.720E-27	0.0000	3.397E-26	0.0000	4.591E-19	0.0000
Total	4.286E-22	0.0000	1.334E-23	0.0000	0.000E+00	0.0000	3.018E-23	0.0000	1.720E-27	0.0000	3.397E-26	0.0000	1.483E+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 = 2.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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	3.113E-01	0.9949	1.571E-07	0.0000	0.000E+00	0.0000	4.432E-04	0.0014	6.644E-04	0.0021	8.486E-05	0.0003	1.044E-05	0.0000
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	5.631E-12	0.0000	1.256E-09	0.0000	0.000E+00	0.0000	1.637E-07	0.0000	7.064E-06	0.0000	1.537E-07	0.0000	3.063E-07	0.0000
Mn-54	5.723E-08	0.0000	9.389E-15	0.0000	0.000E+00	0.0000	1.477E-10	0.0000	4.111E-12	0.0000	2.990E-12	0.0000	9.273E-13	0.0000
Ni-63	0.000E+00	0.0000	1.035E-07	0.0000	0.000E+00	0.0000	9.740E-05	0.0003	4.426E-05	0.0001	2.317E-04	0.0007	3.672E-06	0.0000
Zr-95	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	3.113E-01	0.9949	2.619E-07	0.0000	0.000E+00	0.0000	5.408E-04	0.0017	7.157E-04	0.0023	3.167E-04	0.0010	1.442E-05	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 = 2.000E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-58	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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	3.125E-01	0.9988
Cr-51	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Fe-55	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.688E-06	0.0000
Mn-54	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.739E-08	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.772E-04	0.0012
Zr-95	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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	3.129E-01	1.0000

*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)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	1.000E+01	2.000E+01
Co-58	Co-58	1.000E+00	4.780E-01	1.317E-02	3.628E-04	9.991E-06	2.750E-07	7.569E-09	1.188E-16	2.828E-32
Co-60	Co-60	1.000E+00	4.163E+00	3.583E+00	3.082E+00	2.651E+00	2.279E+00	1.959E+00	9.149E-01	1.929E-01
Cr-51	Cr-51	1.000E+00	6.232E-03	5.305E-07	4.515E-11	3.841E-15	3.266E-19	2.776E-23	1.219E-43	0.000E+00
Fe-55	Fe-55	1.000E+00	4.069E-04	3.075E-04	2.323E-04	1.753E-04	1.323E-04	9.978E-05	2.415E-05	1.342E-06
Mn-54	Mn-54	1.000E+00	1.016E+00	4.315E-01	1.832E-01	7.774E-02	3.298E-02	1.399E-02	1.910E-04	3.436E-08
Ni-63	Ni-63	1.000E+00	6.745E-04	6.521E-04	6.301E-04	6.085E-04	5.874E-04	5.667E-04	4.701E-04	3.066E-04
Zr-95+D	Zr-95+D	6.049E-04	2.163E-04	4.087E-06	7.719E-08	1.458E-09	2.751E-11	5.192E-13	1.235E-21	6.746E-39
Zr-95+D1	Zr-95+D1	9.994E-01	3.295E-01	6.226E-03	1.176E-04	2.220E-06	4.191E-08	7.908E-10	1.881E-18	1.028E-35
Zr-95+D1	Nb-95	9.994E-01	6.357E-02	1.360E-03	2.582E-05	4.876E-07	9.204E-09	1.737E-10	4.131E-19	2.256E-36
Zr-95+D1	äDSR(j)		3.931E-01	7.586E-03	1.434E-04	2.708E-06	5.111E-08	9.645E-10	2.294E-18	1.253E-35

The DSR includes contributions from associated (half-life ó 7 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	1.000E+01	2.000E+01
Co-58	5.230E+01	1.898E+03	6.891E+04	2.502E+06	9.090E+07	3.303E+09	*3.127E+16	*3.127E+16
Co-60	6.005E+00	6.978E+00	8.111E+00	9.431E+00	1.097E+01	1.276E+01	2.733E+01	1.296E+02
Cr-51	4.012E+03	4.712E+07	5.537E+11	6.509E+15	*9.074E+16	*9.074E+16	*9.074E+16	*9.074E+16
Fe-55	6.144E+04	8.129E+04	1.076E+05	1.426E+05	1.890E+05	2.505E+05	1.035E+06	1.863E+07
Mn-54	2.460E+01	5.794E+01	1.365E+02	3.216E+02	7.580E+02	1.787E+03	1.309E+05	7.275E+08
Ni-63	3.707E+04	3.834E+04	3.968E+04	4.109E+04	4.256E+04	4.411E+04	5.318E+04	8.153E+04
Zr-95	6.356E+01	3.294E+03	1.742E+05	9.227E+06	4.888E+08	2.591E+10	*2.126E+16	*2.126E+16

*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)
Co-58	1.840E+00	0.000E+00	4.780E-01	5.230E+01	4.780E-01	5.230E+01
Co-60	1.620E+00	0.000E+00	4.163E+00	6.005E+00	4.163E+00	6.005E+00
Cr-51	1.840E+00	0.000E+00	6.232E-03	4.012E+03	6.232E-03	4.012E+03
Fe-55	5.730E+00	0.000E+00	4.069E-04	6.144E+04	4.069E-04	6.144E+04
Mn-54	1.670E+00	0.000E+00	1.016E+00	2.460E+01	1.016E+00	2.460E+01
Ni-63	1.230E+00	0.000E+00	6.745E-04	3.707E+04	6.745E-04	3.707E+04
Zr-95	2.000E-01	0.000E+00	3.933E-01	6.356E+01	3.933E-01	6.356E+01

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

Nuclide (j)	Parent (i)	THF(i) t=	DOSE(j,t), mrem/yr 0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	1.000E+01	2.000E+01
Co-58	Co-58	1.000E+00	8.795E-01	2.423E-02	6.676E-04	1.838E-05	5.061E-07	1.393E-08	2.187E-16	0.000E+00
Co-60	Co-60	1.000E+00	6.744E+00	5.804E+00	4.993E+00	4.295E+00	3.693E+00	3.174E+00	1.482E+00	3.125E-01
Cr-51	Cr-51	1.000E+00	1.147E-02	9.762E-07	8.307E-11	7.067E-15	6.010E-19	5.109E-23	0.000E+00	0.000E+00
Fe-55	Fe-55	1.000E+00	2.332E-03	1.762E-03	1.331E-03	1.005E-03	7.581E-04	5.717E-04	1.384E-04	7.688E-06
Mn-54	Mn-54	1.000E+00	1.697E+00	7.206E-01	3.059E-01	1.298E-01	5.508E-02	2.336E-02	3.189E-04	5.739E-08
Ni-63	Ni-63	1.000E+00	8.296E-04	8.021E-04	7.750E-04	7.484E-04	7.225E-04	6.971E-04	5.782E-04	3.772E-04
Zr-95	Zr-95	6.049E-04	4.326E-05	8.173E-07	1.544E-08	2.915E-10	5.503E-12	1.038E-13	2.470E-22	0.000E+00
Zr-95	Zr-95	9.994E-01	6.591E-02	1.245E-03	2.352E-05	4.441E-07	8.382E-09	1.582E-10	3.763E-19	0.000E+00
Zr-95	äDOSE(j)		6.595E-02	1.246E-03	2.353E-05	4.444E-07	8.387E-09	1.583E-10	3.765E-19	0.000E+00
Nb-95	Zr-95	9.994E-01	1.271E-02	2.720E-04	5.163E-06	9.752E-08	1.841E-09	3.473E-11	8.261E-20	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i) t=	S(j,t), pCi/g 0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	1.000E+01	2.000E+01
Co-58	Co-58	1.000E+00	1.840E+00	5.132E-02	1.431E-03	3.991E-05	1.113E-06	3.105E-08	5.238E-16	1.491E-31
Co-60	Co-60	1.000E+00	1.620E+00	1.411E+00	1.229E+00	1.070E+00	9.322E-01	8.119E-01	4.069E-01	1.022E-01
Cr-51	Cr-51	1.000E+00	1.840E+00	1.585E-04	1.365E-08	1.176E-12	1.013E-16	8.723E-21	4.136E-41	0.000E+00
Fe-55	Fe-55	1.000E+00	5.730E+00	4.418E+00	3.407E+00	2.627E+00	2.026E+00	1.562E+00	4.259E-01	3.166E-02
Mn-54	Mn-54	1.000E+00	1.670E+00	7.178E-01	3.085E-01	1.326E-01	5.699E-02	2.449E-02	3.592E-04	7.728E-08
Ni-63	Ni-63	1.000E+00	1.230E+00	1.213E+00	1.197E+00	1.181E+00	1.165E+00	1.149E+00	1.074E+00	9.373E-01
Zr-95	Zr-95	6.049E-04	1.210E-04	2.314E-06	4.424E-08	8.460E-10	1.618E-11	3.094E-13	7.912E-22	5.174E-39
Zr-95	Zr-95	9.994E-01	1.999E-01	3.822E-03	7.309E-05	1.398E-06	2.673E-08	5.111E-10	1.307E-18	8.548E-36
Zr-95	äS(j):		2.000E-01	3.825E-03	7.314E-05	1.399E-06	2.675E-08	5.114E-10	1.308E-18	8.553E-36
Nb-95	Zr-95	9.994E-01	0.000E+00	8.030E-04	1.536E-05	2.937E-07	5.616E-09	1.074E-10	2.746E-19	1.796E-36

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 1.53 seconds