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Date: April 18, 2000
Refer to: ER2000-0171

2000
RECEIVED

Mr. John Kieling
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: SUBMITTAL OF RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION (RSI) FOR THE VOLUNTARY CORRECTIVE ACTION (VCA) PLAN FOR POTENTIAL RELEASE SITES (PRSs) 33-007(b), 33-010(c), AND C-33-003

Dear Mr. Kieling:

Enclosed are three copies of the Los Alamos National Laboratory Environmental Restoration (ER) Project's response to your RSI for the VCA Plan for PRSs 33-007(b), 33-010(c), and C-33-003. Per discussion and agreement at the February 2, 2000 meeting with your office to document the work completed to date at these sites, the Status Report for Field Activities at PRSs 33-007(b), 33-010(c), and C-33-003 is also enclosed with this submittal. PRSs 33-007(b) and 33-010(c) are listed on Table A of the Hazardous and Solid Waste Amendments Module of LANL's Hazardous Waste Facility Permit. The RSI was received at the ER Project Office on December 8, 1999, and your office approved an extension for the response until April 18, 2000.

If you have any questions, please call Dave McInroy at (505) 667-0819 or Joe Mose at (505) 667-5808.

Sincerely,

Julie A. Canepa, Program Manager
Los Alamos National Laboratory
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Department of Energy
Los Alamos Area Office

JC/TT/NR/ev

Enclosure: Response to RSI

4791

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Response to
Supplemental Information Request and AOC Acknowledgment
33-007(b), 33-010(c) and C-33-003 Voluntary Corrective Action Plan
Los Alamos National Laboratory
NM0890010515

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The comments are divided into general and specific categories as presented in the letter. Los Alamos National Laboratory's (LANL's) responses follow each NMED comment. Some of the responses make reference to a VCA Status Report, which is attached to this RSI response.

GENERAL COMMENTS

NMED Comment

1. *The VCA plan asserts that the Segmented Gate System (SGS) is a proven innovative technology which was successfully used to sort uranium-contaminated soils at LANL. LANL should provide more detail to support this assertion, in particular, referencing previous reports and sites where SGS was demonstrated. HRMB has not reviewed previous information about the use of the SGS at LANL (the 1996 project report at TA-33 mentioned on page 4 was presumably submitted only to DOE). Regardless of the ability of the SGS to segregate uranium-contaminated materials at a specific concentration, HRMB has concerns regarding the implementation of the SGS. LANL needs to adequately address RCRA contaminants of concern prior to excavating the soil and effectively homogenizing and/or diluting the media through the SGS. Soil may be processed through the SGS numerous times as a means of reducing the volume of generated waste; however, this further homogenizes the soil. Prior to using the SGS, all potential contaminants of concern to human-health* ***and*** *the environment should be addressed. (See specific comment #1.)*

LANL Response

1. The SGS characterizes and mechanically separates radioactively contaminated soils using sodium iodide detectors on a conveyor belt system. SGS significantly reduces the volume of contaminated soils requiring treatment and disposal, enabling large cost savings. The clean soils stream is diverted for return to the site or for other, less expensive, disposal options. Optimum application of this technology is on soils heterogeneously contaminated with one or two radionuclides, such as uranium, thorium, strontium, americium, and plutonium.

   SGS has been used at Johnston Atoll (1990–1998), LANL (1996 and 1999), West Valley (1997), Sandia National Laboratory (1997 and 1998), Savannah River Site (1995), Pantex (1998), New Brunswick's Formerly Utilized Sites Remedial Action Program (FUSRAP) (1998), and Nevada Test Site (1998). Most of these projects have been conducted with the assistance of the Department of Energy's (DOE's) Accelerated Site Technology Deployment (ASTD) Program. This program provides technical assistance by reducing many of the barriers to the deployment of new technologies at DOE sites. Further information about this soil-sorting technology and these projects can be found on the ASTD web site (`http://id.inel.gov/astd/index.html`).

As part of ASTD support, cost and performance reports are prepared for each technology deployment project. For SGS, it has been shown that costs can be reduced up to 75% over baseline costs, with savings dependent upon the volume of soil processed. SGS operational costs range from $200 to $1000 per yd^3 of soil treated. (One major cost factor is whether disposal is done on- or off-site.) It is estimated that as much as $45 million can be saved for each 100,000 yd^3 of soil processed.

At LANL, consideration of the SGS cleanup technology is particularly important. The ER Project's cleanup work includes firing sites at TA-15 at which tons of uranium were expended. Application of the SGS at TA-33 has demonstrated that SGS is a viable remediation technology; the baseline for the cleanup of major firing sites assumes its use and associated cost savings.

The SGS is a transportable gamma-radiation detector system with motorized conveyor belts, a variable belt speed motor controller, air-actuated segmented gates, a radionuclide assay computer system, and two arrays of sodium iodide (NaI) detectors applicable to radionuclides that emit low and high energy gamma rays. The sorting conveyor, detector arrays, segmented gates, and all downstream conveyors and substyems are controlled through the use of an on-board computer that is operated from a mobile van.

Soil is deposited on the SGS conveyor belt using a screen to control the thickness and width of soil layer. The SGS screen is adjusted to spread the material across the conveyor belt to a depth appropriate for the radioisotope of interest and the soil characteristics. The soil passes under two sets of gamma-radiation detector arrays housed in shielded enclosures. The first, the thin array, is designed for 0.16-in. NaI detectors, which are generally used to detect gamma radiation from 15 keV to 200 keV. The second, the thick array, is designed for 2-in.NaI detectors, which are generally used to detect gamma radiation from 150 keV to 1 MeV.

The process material is conveyed underneath the detector arrays at a preselected speed, based on the separation criteria, contaminant, and soil type. The arrays are linked to a control computer which toggles pneumatic diversion gates located at the end of the sorting conveyor. Contaminated material that exceeds the separation criterion for radioactivity is diverted to the contaminated material conveyor, where it is transferred to a stacking conveyor on one side of the SGS. The below-criterion material falls onto the below-criterion conveyor that transports it to a second stacking conveyor on the opposite side of the SGS.

The treatment of radionuclide-contaminated soils using the SGS offers the following advantages:

- The system physically surveys the entire volume of soil to be processed.
- The system typically reduces the volume of soil needing treatment or disposal.
- No chemicals or other additives are used.
- The generation of secondary waste is limited to PPE.
- Dry contamination of the SGS has proven effective.

Technology limitations associated with the SGS include:

- The two detector arrays provide the ability to analyze simultaneously a maximum of two radionuclides with different gamma energies.
- The SGS is primarily limited to gamma-emitting radionuclides, although it can be modified to detect beta-particle-emitting radionuclides.

- Prior knowledge of the primary radioactive contaminants is required, and soil cannot be properly sorted for unknown radioactive contaminants.
- Material greater than a nominal 1.5 in. in diameter cannot be processed by the SGS without precrushing.

The operating parameters for the SGS at TA-33 were selected to provide the optimum sensitivity for the contaminant of interest: natural uranium. The belt speed and soil layer thickness were chosen to maximize the sensitivity of the equipment. This resulted in a setpoint of 50 pCi/g. A belt speed of 30 ft/min, with a soil thickness of 2 in. on the belt, proved optimal for the natural uranium heterogeneously distributed in the suspect soil, resulting in a processing throughput of approximately 28 yd^3 per hour.

LANL agrees with HRMB's position that RCRA contamiants of concern need to be addressed. Therefore, LANL will define the nature and extent of RCRA-constituent contamination at these sites during the investigation associated with the TA-33 aggregate of our watershed approach.

In terms of the future application of SGS technology at LANL sites, the potential for homogenizing and diluting material through the SGS will be considered part of cleanup planning and design.

NMED Comment

2. *Section 1.1.2, Regulatory Driver and Record, page 4, paragraph 2. "Upon completion of the VCA, LANL will submit a VCA Completion Report to the NMED requesting an NFA determination for PRSs 33-007(b) and 33-010(c)." LANL should collect all pertinent data to support an NFA determination. The VCA plan summarizes the results from previous investigations to determine the* potential *extent of contamination at the PRSs (e.g., page 13), but does not propose sampling adequate to address the extent of contamination. LANL needs to define extent in the drainages to the toe of the colluvium in the canyon systems to be investigated by the Canyons Focus Group. All sampling in the drainages and canyons should follow the canyons geomorphic/stratigraphic focused sediment sampling approach.*

LANL Response

2. LANL agrees with HRMB's position that all pertinent data need to be collected to support an NFA determination. Prompted by this comment, LANL and HRMB personnel discussed (verbally) the sampling strategy. LANL has subsequently adjusted the drainage sampling strategy proposed in the VCA plan. Drainage sediment sampling locations were selected in conjunction with Canyons Focus Area personnel, in accordance with the Canyons core document sampling strategy. These sampling locations have been documented in the VCA status report that is attached to this RSI response.

   Based on results of the sampling conducted during the VCA, LANL has determined that NFA will not be pursued for PRSs 33-007(b) and 33-010(c) at this time. Any remaining corrective action activities for these PRSs will be addressed in the integrated approach for the TA-33 aggregate, as scheduled in the current ER Project baseline. To document the results of the VCA activities performed in 1999, a status report documenting the work performed to date is attached.

NMED Comment

3. *In the VCA plan, LANL proposes screening action levels (SALs) for an industrial receptor to further assess potential chemical risks to humans at these PRSs. The rationale is based on location, restricted public access and an expectation for future industrial land use at the site which is reflected in the LANL Future Land Use Map. However, the assumptions upon which this rationale is based are not enforceable and do not reflect potential land use changes at LANL. Therefore, the VCA Completion Report should also present an evaluation of risk for a residential receptor to allow for comparison of current and potential future risk scenarios.*

LANL Response

3. LANL agrees with HRMB's position on including an evaluation of risk for a residential receptor for comparison purposes and will prepare future risk assessments according to the agreed-upon technical approach with HRMB. Based on the results of the sampling conducted during the VCA, it was decided that NFA will not be pursued for PRSs 33-007(b) and 33-010(c) at this time. Any corrective action activities at these PRSs, as well as any associated risk evaluations, will be addressed in the integrated approach for TA-33 as this watershed is scheduled in the current ER Project baseline.

SPECIFIC COMMENTS

1. **Section 1. 0, Introduction, page 1:**

LANL Statement: "No chemical contamination has been found at these sites above risk-based levels."

NMED Comment: *Specify whether the risk-based levels are protective of human health, the environment or both. The plan predominately addresses risk to an industrial receptor. HRMB believes it is premature to conclude that chemical contamination does not exceed risk-based levels since there is insufficient data regarding an ecological risk evaluation. At PRS 33-007(b), sample results for silver, chromium and zinc suggest levels of potential ecological concern (page 8). At PRS 33-010(c), sample results for copper, antimony and zinc are at levels of ecological concern. The VCA should delineate the extent to which these metals are present and specifically address taking action to address these potential contaminants of concern before the SGS activities are initiated.*

LANL Response

Previous site investigations presented in the VCA plan for this effort discussed risk-based levels that are protective of human health. LANL agrees with HRMB's position that it is premature to conclude that there are no ecological risks at the site. Based on the results of the sampling conducted during the VCA, it was decided that NFA will not be pursued for PRSs 33-007(b) and 33-010(c). Any remaining contamination existing at these PRSs, as well as any associated risk evaluations, will be addressed in the integrated approach for TA-33, as scheduled in the current ER Project baseline. To document the results of the VCA activities performed in 1999, a status report documenting the work performed to date is attached.

2. **Table 2.1-1 and Table 2.2-2, pages 8 and 10:**

NMED Comment: *The footnotes for these tables misidentify the references from which the background values and screening action levels were obtained and contradict the explanation provided within the text for how these values were derived. The background values within the table are described on page 8 as, "either the LANL upper tolerance limits (UTLs) of background sample results or detection limits (Ryti, et al., 1998, 59730.2)." The screening action levels are based on Region 9* ***Preliminary Remediation Goals*** *(PRGs) [correct footnote], as stated on page 19. LANL should explain why particular table cells are shaded. Also within the footnotes for the tables, LANL should clarify that the PRGs used are for an industrial receptor. The screening action levels (SALs) seem to be derived in a manner inconsistent with the methodology prescribed in the 1998 Installation Work Plan. Due to the presence of multiple contaminants, the values for the SALs presented in these tables should be 1/10th of the PRG values. LANL should specify whether the values are protective of human health, the environment or both. Lastly, footnote "e" includes the statement that the conversion "from pCi/g to mg/kg was based on natural uranium." Explain the assumptions upon which this conversion was based. The calculation for the conversion should be provided in the plan.*

LANL Response

LANL agrees with HRMB's position that both tables referenced in specific comment 2 are confusing. Shaded cells were used to show detections greater than SALs. These tables contain previous RFI data, which will be used in future screening and risk assessments along with data collected during the VCA and future sampling efforts. Future screening and risk assessments will be conducted per the agreed-upon technical approach with NMED. All tables in future reports will provide the data in a clear and concise manner.

The isotopic ratios for natural uranium used to convert pCi/g to mg/kg are provided in Appendix A of the attached status report.

3. **Section 3.0, Basis for Cleanup Levels, page 12, paragraph 1:**

LANL Statement: "The Residual Radioactive (RESRAD) computer code was used to determine concentrations of residual uranium acceptable to meet the proposed Environmental Protection Agency (EPA) dose limit of 15 mrem/yr. The calculations were determined for both recreational trail hiker and commercial or industrial worker scenarios. The potential radiation dose (PRD) limit for either scenario is achieved with soil concentrations of approximately 636 pCi/g for total uranium."

NMED Comment: *Clarify why the dose limit of* ***15 mrem/yr*** *is referred to in the paragraph above, but the SAL for uranium in Tables 2.2-1 and 2.2-2 was derived using RESRAD and a target dose of a target dose of* ***10 mrem/yr****. The parameters, input values and assumptions used for RESRAD should be provided, as well as the rationale for the selection of these values and their applicability to LANL's site conditions.*

LANL Response

Historically, SALs for radionuclides, calculated based on a residential scenario with a dose limit set at 10 mrem/yr, have been used for preliminary screening. This was done to achieve screening levels below the 100 mrem basic dose allowed by DOE Order 5400.5. This level also coincides with the allowable dose of 10 mrem/yr from air.

The use of the RESRAD computer code to calculate cleanup levels is addressed in section 2.2 of the attached VCA status report. The parameters used for the RESRAD calculations and the calculations themselves are provided in Appendix B of the attached status report.

4. **Section 3.0, Basis for Cleanup Levels, page 12, paragraph 2:**

LANL Statement: "A target cleanup level of 50 pCi/g would be lower than the LANL SAL for exposure of 90 pCi/g (67 pCi/g U-238, 10 pCi/g U-235, and 13 pCi/g U-234). Note that this exposure SAL may be converted to the LANL SAL for toxicity (29 mg/kg) by dividing the known activity by the specific activity for each of the isotopes and then summing the concentrations."

NMED Comment: *Explain why uranium 234, 235 and 238 activities were added together. Explain why the determination was made to express SALs in terms of mass (mg/kg) rather then as activity concentrations, for example. Explain why isotopic natural equilibrium was assumed.*

LANL Response

Individual activities are added together in order to obtain the total uranium activity. SALs are expressed in terms of both mass (mg/kg) and activity (pCi/g). Assumptions of isotopic equilibrium are required in order to make conversions between these units. Depending on the types of samples collected and the analytical methods employed, it is often convenient to express total uranium concentrations in units of mass.

5. **Section 4.3.1, Removal, pages 14-15:**

NMED Comment: *This paragraph describes briefly the removal activities that will occur, but a general description should also be provided of measures taken to prevent run-on and run-off from the piles as well as dust suppression efforts during operations.*

LANL Response

This comment is addressed in section 2.3 of the VCA status report that is attached to this RSI response.

6. **Section 4.3.1, Removal, page 15, paragraph 3:**

LANL Statement: "The holding areas and diversion piles will be lined with geotextile or straw. This will serve as a marker to differentiate between the diverted or stockpiled material and the original ground surface. To ensure that potential contamination does not remain following the VCA, some of the original surface material will be removed with the stockpiled material."

NMED Comment: *Please clarify whether the former pile areas are included within the area that the radiation survey will cover during demobilization as described in Section 4.4 Site Restoration, page 16, paragraph 2.*

LANL Response

This comment is addressed in section 2.3 of the VCA status report that is attached to this RSI response.

7. **Section 4.3.2, Screening, page 15, paragraph 2:**

LANL Statement: "A front end loader will transfer this material to a designated area...and will spread the material so that it may be easily screened...."

NMED Comment: *A more thorough description of the process (i.e. maximum depth of spread soil) or reference to a previous report or Standard Operating Procedure (SOP) for this activity should be provided.*

LANL Response

This comment is addressed in section 2.3 of the VCA status report that is attached to this RSI response.

8. **Section 4.4, Site Restoration, page 16, paragraph 3:**

LANL Statement: "The material that is returned to the three PRSs will be placed and contoured to minimize future erosion."

NMED Comment: *Clarify if additional backfill material will be deposited at the sites, the origin of that fill and how the area will be stabilized (e.g. seeded, best management practices implemented, etc.).*

LANL Response

This comment is addressed in section 4.0 of the VCA status report that is attached to this RSI response.

9. **Section 5.3, Use of Confirmation Sampling to Evaluate Risk, page 19, paragraph 2:**

LANL Statement: "For this evaluation the screening action levels (SALs) used for all PRSs are those derived by EPA Region 9 as reported in *Region 9 Preliminary Remediation Goals...*"

NMED Comment: *The SAL values derived in the tables on pages 8 and 10 do not appear to be consistent with the methods prescribed in the Region 9 PRGs cited. SALs should be 1/10th of the PRGs due to the presence of multiple contaminants.*

LANL Response

See the response to specific comment 2 above.

10. **Section 5.3, Use of Confirmation Sampling to Evaluate Risk, page 19, bullets 2 and 3:**

LANL Statement: "The industrial receptor is appropriate for this PRS because the potential for human exposure to contaminants is very low...this is a remote area of the Laboratory, and public access to the site is not allowed."

NMED Comment: *LANL needs to provide additional rationale for selecting an industrial receptor scenario. It should reflect who might actually be present at the PRS, currently and in the future. The land use map designating the area as industrial is not adequate. Explain in more detail how public access is prevented. (See general comment #3.)*

LANL Response

According to the 1995 annual update to LANL's Site Development Plan, the future land use for TA-33 is designated as continued industrial operations. Because of the ongoing nature of the activities conducted at TA-33, and the maintenance of the high security area at Main Site, the site will remain under the care of DOE. TA-33 is fenced to prohibit unauthorized access. Fences and

site security (protective force patrols) will be maintained to prohibit public access. Should the future land use for TA-33 change, it remains DOE's responsibility to protect human health and the environment.

11. **Section 5.3, Use of Confirmation Sampling to Evaluate Risk, page 19, paragraph 3:**

LANL Statement: "Because these model-specific methods are different from the methodology used to evaluate other noncarcinogens, lead and uranium SALs should not be adjusted by 1/10th."

NMED Comment: *Provide a toxicological-based rationale for not considering lead and uranium exposure as at least additive. This section describes an intent to perform an ecological screening assessment for the sample results obtained as part of the confirmation sampling. LANL should assess ecological risks based on sample data collected to date, prior to excavating soil for this VCA. The VCA only proposes to address uranium contamination. Confirmatory sampling and subsequent data assessment are proposed, but any residual contamination at the PRSs, particularly for contaminants other than uranium, should be addressed in terms of ecological concerns. The VCA plan addresses human health risks for the data collected previously, but not ecological risks. LANL should explain why environmental risks are not accounted for in the data presented in the VCA. LANL should adequately characterize the PRSs prior to the soil homogenization/dilution that will result from using the SGS.*

LANL Response

Previous site investigations presented in the VCA plan for this effort discussed risk-based levels that are protective of human health. LANL agrees with HRMB's position that it is premature to conclude that there are no ecological risks at the site. Based on the results of the sampling conducted during the VCA, it was decided that NFA will not be pursued for PRSs 33-007(b) and 33-010(c). Any remaining contamination existing at these PRSs, as well as any associated risk evaluations, will be addressed in the integrated approach for TA-33, as scheduled in the current ER Project baseline. To document the results of this VCA, the attached status report records the work performed to date.

MISCELLANEOUS COMMENTS (NO RESPONSE REQUIRED)

1. **Section 1.0, Introduction, page 1, paragraph 1:**

LANL Statement: "This document describes the voluntary corrective action (VCA) to be conducted...pursuant to a no further action (NFA) determination."

NMED Comment: *The statement implies that the VCA is in response to an NFA determination, rather then being conducted with the intent to later request an NFA determination. LANL should clarify the intent of this statement, preferably selecting a more accurate term than "pursuant". In addition, if LANL intends to request an NFA determination in the near future for the PRSs addressed in this VCA plan it should be prepared to present sufficient data to support that determination, including characterizing the nature, rate and extent of contamination in the drainages to the location where the Canyons Focus Group investigation begins. (See general comment #2.)*

2. **Page 7:**

   NMED Comment: *It appears that the page numbering inadvertently skipped page 7.*

3. **Section 5.2, Sampling Design, page 16, paragraph 2:**

   LANL Statement: "Sample handling procedures will conform to all applicable LANL ER SOPs, QPs, and LIRs."

   And **Section 6.3, Method of Management and Disposal, page 21, paragraph 1:**

   LANL Statement: "The low-level radioactive wastes will be stored on site in an RCA until the results of the chemical analyses are known."

   NMED Comment: *An attached acronym list or more frequent definition of the acronyms used in the text is needed. Define "QPs," "LIRs" and "RCA".*

4. **Section 8.0, References, page 22, reference 4:**

   LANL Statement: "EPA, 1999. Region 9 Preliminary Remediation Goals (PRGs). (EPA, 1999, ER ID 54899.1)."

   NMED Comment: *This reference is different from the EPA PRG document (EPA 1998, 58751) cited within the VCA plan on page 19. The citation of references should be consistent.*

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A Department of Energy
Environmental Cleanup Program

LA-UR-00-1913
April 2000
ER2000-0160

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Segmented Gate System Voluntary Corrective Action Status Report for Potential Release Sites

33-007(b)
33-010(c)
C-33-033

Los Alamos
NATIONAL LABORATORY
Los Alamos, NM 87545

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Produced by the Environmental Restoration Project
Author: Remedial Actions Focus Area, Firing Sites Team

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1.0 INTRODUCTION

This status report describes the field activities and preliminary results from the Los Alamos National Laboratory (LANL) Environmental Restoration (ER) Project's voluntary corrective action (VCA) conducted at potential release sites (PRSs) 33-007(b), 33-010(c), and C-33-003 from April to June 1999. These three PRSs are associated with historical testing of nuclear weapons initiators and are located within technical area 33 (TA-33). TA-33 consists of five general areas that were used for weapons-related experiments: Main Site, Area 6, East Site, National Radio Astronomy Observatory (NRAO) Site, and South Site (Figure 1.0-1).

PRSs 33-007(b) and 33-010(c) are solid waste management units (SWMUs) listed on Table A of LANL's Hazardous Waste Facility Permit. PRS 33-007(b) was a gun firing area that consisted of a berm into which projectiles were fired. PRS 33-010(c) was a surface disposal area that received debris from implosion experiments. A Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) was conducted at PRSs 33-007(b) and 33-010(c) in 1994 (LANL 1995, 51903.1). PRS C-33-003 was discovered during brush-clearing activities in 1996 and consisted of a fill area that was known to contain material from a firing site where projectiles containing uranium had been fired. Preliminary data review from the previous investigation and/or field reconnaissance support the assumption that natural uranium was a primary contaminant at PRSs 33-007(b), 33-010(c), and C-33-003. Results of inorganic analyses at these PRSs indicate concentrations of metals above LANL background values, but below human health screening action levels (SALs). These metals include: antimony, beryllium, chromium, lead, nickel, selenium, silver, and zinc. The primary mechanism for contaminant transport was erosion of contaminants into the drainages from each of the PRSs (via snowmelt and rainfall). VCA activities were proposed and implemented to reduce the amount of uranium contamination and to mitigate potential contaminant transport to the nearby drainages.

This VCA used the Segmented Gate System (SGS) technology to separate radioactively contaminated soil and debris (exceeding dose-based level) from nonradioactively contaminated soil and debris below the dose-based level. The SGS separated the material into two streams: a radioactive waste stream (soil and/or debris with activities above the dose-based SGS cleanup criterion) and an acceptable stream (soil with activities below the dose-based SGS cleanup criterion). The SGS was used to sort and assay 2526 yd^3 of material from PRSs 33-007(b), 33-010(c), and C-33-003.

The area encompassing the three PRSs was designated as an area of contamination (AOC), per New Mexico Environment Department (NMED) Hazardous & Radioactive Materials Bureau (HRMB) recommendation. This was done in order to transport and process material from each PRS at a centralized location and then return the below cleanup criterion material back to each PRS without triggering RCRA land disposal restrictions or minimum technology requirements. Figure 1.0-2 shows the locations of PRSs 33-007(b), 33-010(c), and C-33-003 with respect to the AOC boundary. Above cleanup criterion soil and debris were put in containers and disposed of as low-level radioactive waste; the below cleanup criterion soil and debris were returned to the corresponding PRS. Each PRS was then contoured and restored to mitigate further migration of debris into associated drainages.

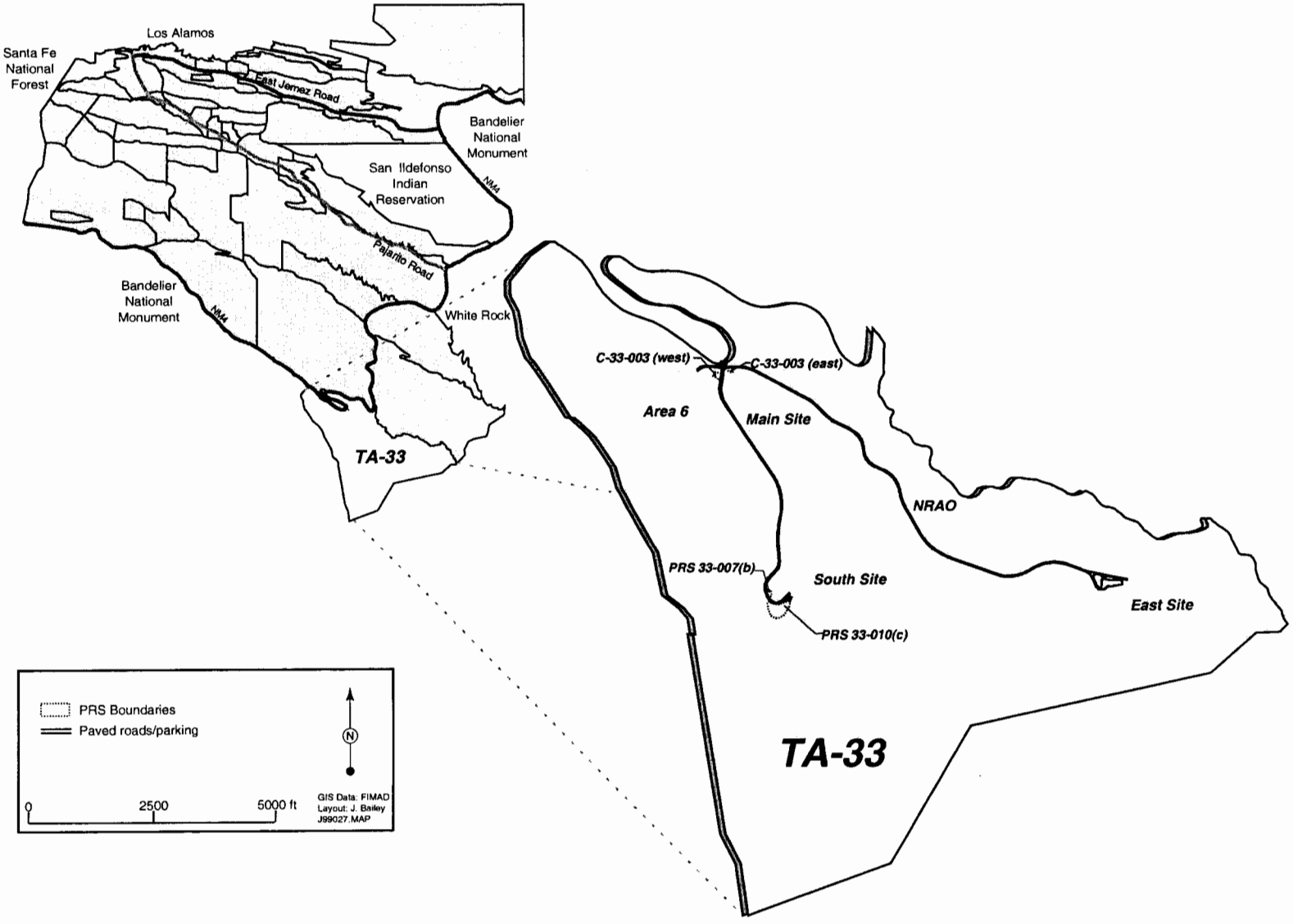

Figure 1.0-1. Location of TA-33 with respect to Laboratory TAs and surrounding landholdings

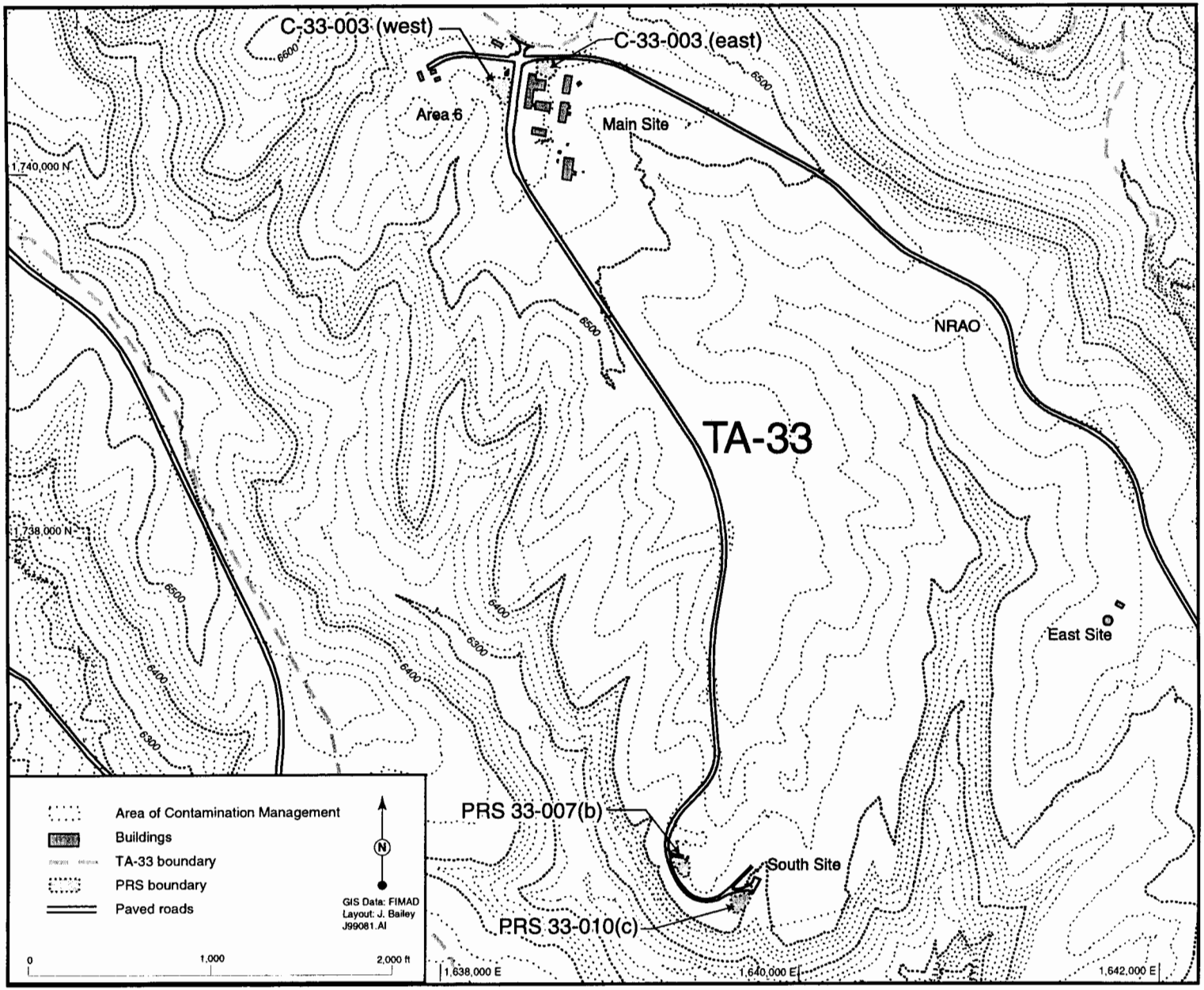

Figure 1.0-2. Location of PRSs 33-007(b), 33-010(c), and C-33-003 within the area of contamination at TA-33

2.0 CORRECTIVE ACTION ACTIVITIES

The remedial activities as presented in the VCA plan were designed (1) to separate and remove radioactively contaminated material until the remaining material was below human health and ecological dose-based levels, and (2) to mitigate further migration of contaminants and debris. The remedial activities were conducted per the prescribed SGS and manual cleanup criteria presented in Section 3 of this document. The activities included excavating soil and debris from each PRS and transporting the material to a centralized location where the material was processed using the SGS technology. The SGS segregated the material into a radioactive waste material (material with activities above the SGS cleanup criterion) and material to be returned to the PRSs (material with activities below the SGS cleanup criterion). The material not processed by the SGS was screened using hand-held radiation detectors and segregated manually, based on a background cleanup criterion (Ryti et al. 1998, 59730). Confirmatory sampling was conducted to verify that any radioactivity in the material returned to the sites was below cleanup criteria. The sites were then restored to mitigate further erosion to the watercourses. Based on the results of confirmation sampling, LANL has determined that NFA will not be pursed at this time.

2.1 SGS Description

The SGS provides a way to separate out radioactively contaminated soil (i.e., with activity above the SGS cleanup or target criteria). The SGS itself is a combination of conveyor systems, radiation detectors, and computer controls that diverts radioactively contaminated soil from a moving feed supply on a conveyor belt (Figure 2.1-1).

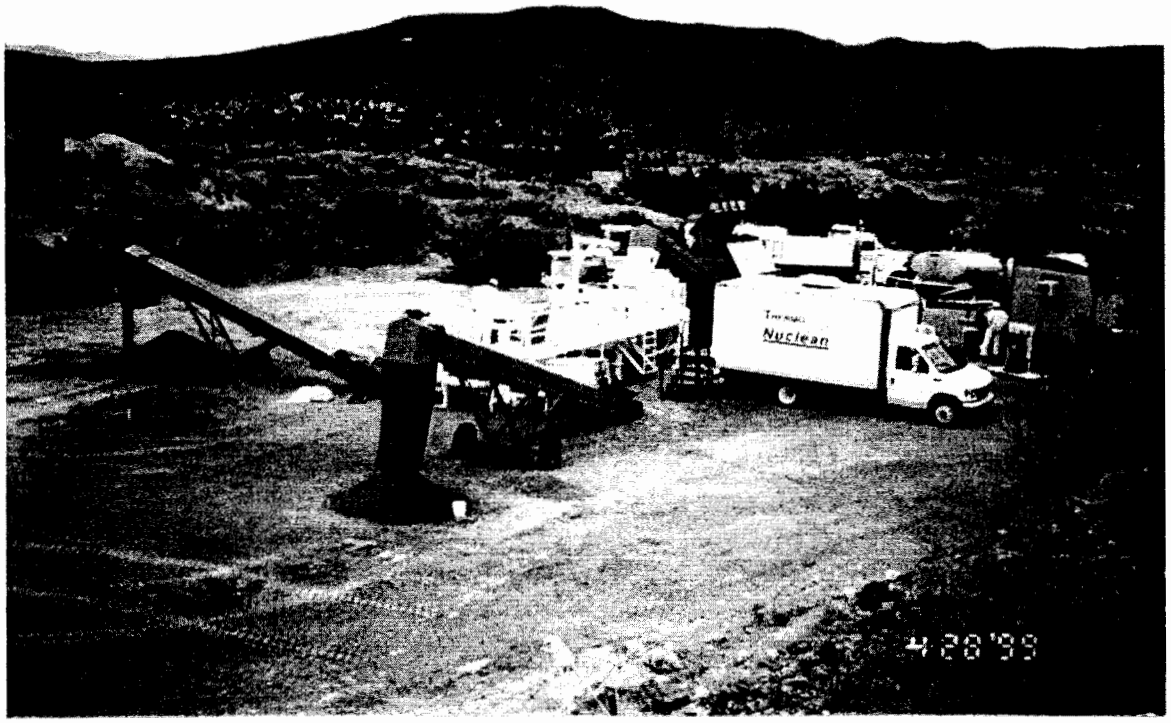

Figure 2.1-1. The SGS plant processing soil at TA-33

Figure 2.1-2 depicts the process flow for the SGS. Soil was transported to the hopper of the SGS processing plant. Feed soil was screened by the screen/hammermill plant, and all rocks and debris with a dimension of 1.5 in. or more were removed. The soil that passed through the screen/hammermill plant was stored in the feed surge bin, which is the reservoir for soil to be deposited on the main conveyor belt. A mechanical screen controls soil to flow out onto the conveyor belt at a thickness of 1.5 in.

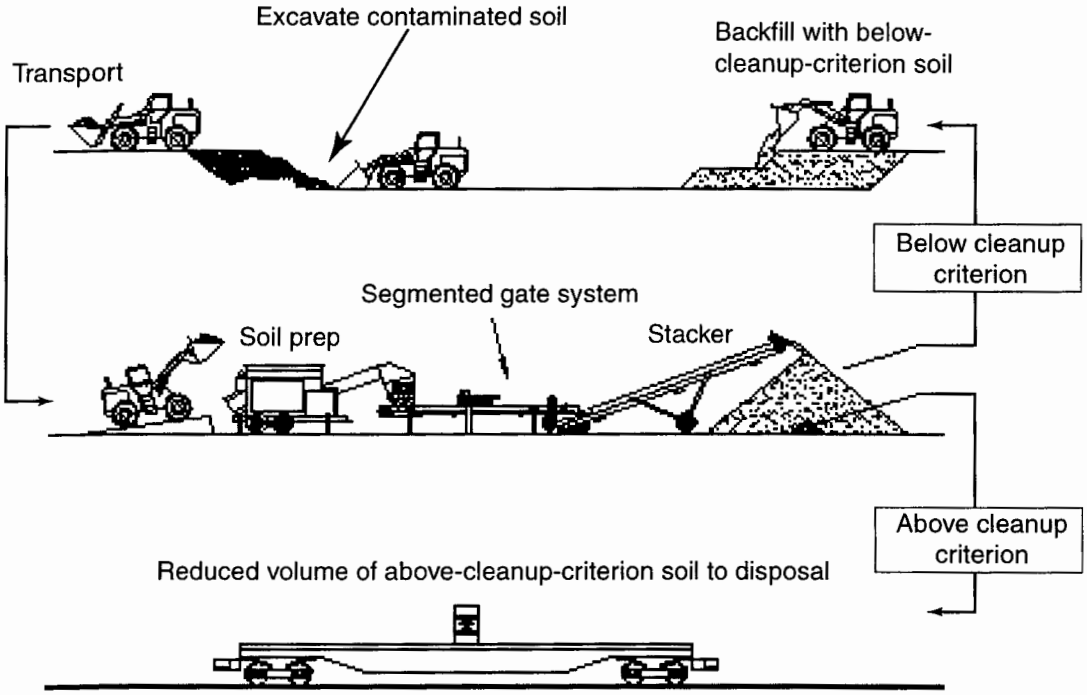

Figure 2.1-2. Schematic diagram of SGS operations

The material passed under two sets of sodium iodide gamma radiation detector arrays housed in shielded enclosures. Each detector array spanned the width of the belt with two rows of detectors (one row of eight detectors and another row of seven detectors) in an offset arrangement. The two detector arrays operated simultaneously.

The process material was conveyed at a speed of 30 ft per minute (based on site-specific soils) underneath the detector arrays. The conveyor speed was calculated based on one week of field screening and test runs conducted by the SGS vendor. Counts from the detectors were collected by an on-board computer, which activated the pneumatic gates based on analysis of the activity in the soil. Contaminated material that exceeded the SGS cleanup criterion for radioactivity was diverted from the normal flow stream and deposited by the above-cleanup-criterion stacking conveyor on the ground where it was packaged for disposal. The below-cleanup-criterion soil was routed to another stacking conveyor that piled it on the ground.

2.2 Cleanup Criteria

The DOE's RESRAD (residual radioactivity) computer model was used to calculate the radiation exposure dose received by an individual on a site from certain isotopes and radioactive daughter products (based on the proposed EPA dose limit of 15 mrem/yr). The levels were calculated for both industrial worker and

on-site hiker scenarios. The RESRAD model was run for both depleted and natural uranium; however, since historical evidence indicated natural uranium was used at these sites, the natural uranium values were used for this VCA. (Note that calculations were run for the isotopic abundances at these sites and natural uranium was determined—see Appendix A). The output from the model showed that, at soil activities of approximately 652 pCi of natural uranium per gram of soil, the radiation dose limit was not exceeded for either scenario. The RESRAD model calculations and results are presented in Appendix B.

To implement DOE's policy of reducing radiation exposure to levels that are as low as reasonably achievable (ALARA), it was decided to set the SGS cleanup criterion based upon the capabilities of the SGS. It was estimated that the SGS could segregate material down to approximately 50 pCi/g. Therefore, the target SGS cleanup criterion, or target action level, was set at 50 pCi of natural uranium per gram of soil.

The target SGS cleanup criterion of 50 pCi/g was achieved for PRS 33-007(b) and C-33-003. However, due to the fine, homogeneous nature or dispersed contamination of the soil from PRS 33-010(c), the SGS was unable to separate the material efficiently. This soil was reprocessed by the SGS, this time using a target SGS cleanup criterion of 65 pCi/g. The SGS was then able to effectively separate the material and still achieve an actual average activity level below the target SGS cleanup criterion (50 pCi/g) in the returned soil.

2.3 Excavation, Segregation, and Screening

2.3.1 Excavation Activities

Removal activities included excavating all the radioactively contaminated soil and debris from the PRS and stockpiling the material in a holding area adjacent to the SGS plant. Excavations were conducted using a Komatsu WA250-1 front-end loader, a Dresser TD20 bulldozer, and a Koehring 6633 excavator. Material was transported from the PRSs to the holding area using a Peterbuilt dump truck with a capacity of 10 yd^3. Material from each PRS was managed separately. The material was kept in the holding area in order to maintain a sufficient stockpile of feed material for the plant. The holding areas were lined with straw to differentiate between the stockpiled material and the original ground surface.

All piles were sprayed with water from a high-pressure sprayer for dust suppression. Also, a water truck was used to control dust from road surfaces. A combination of straw bale and silt fence best management practices (BMPs) were used at the SGS separation area to control run-off into the main drainage at South Site TA-33.

The material was transported from the stockpile to the hopper of the shaker plant portion of the SGS plant using a Volvo L90C front-end loader. This loader was dedicated to moving contaminated soils and oversized materials within the work zone. The processed material that fell below the clean-up criterion level was stockpiled in a separate part of the staging area using a Volvo L120C front-end loader. This loader was dedicated to moving below clean-up criterion soil and debris within the work zone.

2.3.2 SGS Separation

Soil separation began by collecting material from the feed stockpile and loading it into the hopper of the screen plant. The screen/hammermill screened out any debris, rock, or gravel with a diameter greater than 1.5 in. Oversized material was stockpiled on the northern perimeter of the staging area until it could be screened for radioactivity by hand. Any material with a diameter of less than 1.5 in. was then directed to the hopper at the SGS plant.

The above cleanup criterion soil was diverted to a pile on the ground and then packaged into roll-off containers. The soil that met SGS clean-up criterion was diverted to a separate pile on the ground and transferred (using a dedicated noncontaminated front-end loader) to the clean soil stockpile area located east of the staging area. Materials from each PRS were kept in separate stockpiles so that they could be returned to their original locations. Once the SGS separations were complete, the contaminated soil with activity below the remediation target criteria was hauled back to its original location using the dump truck (which was decontaminated before being used to haul this material). To ensure that no residual contamination was left on the ground where the diverted material had been stored, approximately 0.3 ft of soil below the pile was excavated and included with the waste soil. Radiation surveys confirmed that no radioactive material remained under the diversion stacker. Upon completion of all processing activities with the SGS plant, a radiation survey was conducted over the areas where the plant had been staged and the feed soils had been stockpiled. The area under the stackers was surveyed with instruments calibrated to twice site background to confirm that no radioactive material remained on the ground surface. No radioactivity (defined as greater than two times the site-specific background) remained at the processing area.

2.3.3 Screening Activities

Oversized material was screened by hand. A front-end loader deposited the oversized material one layer thick (approximately 6 in.) on the ground. Radiological screening personnel (RSP) screened the oversized material for beta/gamma radiation activity using a Ludlum Model 12 with a model 44-9 GM tube detector. The nonradioactively contaminated tuff boulders were loaded into the dump truck and returned to the sites. The metal that was radioactively contaminated (greater than two times background) was segregated into a waste container and disposed of as radioactive waste. The nonradioactively contaminated metal was recycled or disposed of as industrial waste.

Radioactively contaminated material that was associated with the PRSs or with drainages adjacent to the PRSs was segregated manually using the two-times background cleanup criterion. To locate hot spots, or areas where uranium had migrated, radiation field screening was conducted. Any sediment that showed activity at two times the background level for that day was either removed and processed through the SGS plant or removed and disposed of directly as low-level radioactive waste. Surface sediment was surveyed (1) for beta/gamma radiation, using a Ludlum Model 12 with a model 44-9 GM tube detector, and (2) for alpha radiation, using a sodium iodide detector.

2.4 Sampling Activities

During the VCA, samples were collected from the material that met clean-up criterion, from below the excavations, and from the drainages adjacent to each PRS. One sample was taken from every 200 yd^3 of material that met clean-up criterion. Samples were collected from the footprint of each excavated area using a grid-based randomization approach. Each footprint was divided into quadrants. One location was selected from each quadrant. Two samples were then collected from two depths (0–0.5 and 2.0–2.5 ft) at each location. Lateral bounding samples were collected from two depths (0–0.5 and 2.0–2.5 ft, or at the tuff interface) at two locations in the drainages adjacent to each PRS. Drainage sample locations (one depth only) were selected by the Canyons Focus Area sampling team.

The surface samples were collected using stainless steel spoons, in accordance with LANL-ER-SOP-06.09, "Spade and Scoop Method for Collection of Soil Samples." The subsurface samples were collected from the tuff using a Bosch hammer drill with auger, in accordance with LANL-ER-SOP-06.18, "Collection of Sand, Packed Powder, or Granule Samples Using the Hand Auger." The samples were handled and packaged in compliance with sample management office (SMO) and centralized data

management (CDM) guidelines. The radiation control technician (RCT) screened the samples to meet radiological shipping requirements following LANL-ER-SOP-10.11, "Soil Sample Field Screening to Meet Radioactive Sample Shipping Requirements." All samples were submitted to an off-site laboratory and analyzed for inorganics and isotopic uranium.

3.0 SITE-SPECIFIC RESULTS

3.1 PRS 33-007(b)

3.1.1 Description and Operational History

PRS 33-007(b) consisted of soil berm TA-33-63, which contained uranium both on the surface and within the berm. The uranium originated from projectiles fired into the berm by guns mounted in Building TA-33-25, about 50 ft south of the berm. The berm was approximately 50 ft × 50 ft × 10 ft. It was reinforced with a timber barricade on the south side. Experimental firing activities were conducted at PRS 33-007(b) from the early 1950s to the late 1950s. Guns of 2- to 4-in. bore fired projectiles into berm TA-33-63 to determine the effectiveness of initiator components. Based on historical information, the projectiles were believed to contain uranium, other metals, and tritium (LANL 1995, 51903.1). No information is known about the fate of the projectiles.

There was very little evidence of erosion at this site; however the north side of the berm drains into a main tributary of Chaquehui Canyon. The berm sloped toward the north and west, and any surface water runoff from the site would have entered a drainage channel that led west. The surface water assessment for PRS 33-007(b), which was conducted in accordance with ER-SOP-2.01, "Surface Water Site Assessments," generated an erosion matrix score (EMS) of 59.3, indicating the potential for erosion and contaminant migration to occur at the site.

3.1.2 Distribution of Contaminants

Based on the operational history of this PRS, the nature of the firing site activities conducted, and the results of previous sampling and analyses, uranium was determined to be the major contaminant of concern at this PRS. Oxidized uranium solids were present on the surface and at various depths within the berm. Isotopic analysis and historical information indicated natural uranium. The vertical extent of uranium contamination was not known prior to the VCA because samples had not been collected from beneath the berm. One sample, taken west of South Site Road from a culvert on the rim of Chaquehui Canyon, contained uranium above its screening action level (SAL) (other metals were below their SALs). This confirmed that uranium had been migrating from the berm into the drainage.

3.1.3 Removal Activities

During the VCA, best management practices (BMPs) were installed to minimize the potential for surface water runoff. At PRS 33-007(b), straw bale barriers were used on the downslope areas of soil disturbance and within the adjacent drainage channels. Sandbags were used to divert run-on.

Excavation at PRS 33-007(b) began on the south end of the berm area. Soil was excavated from the berm using the front-end loader and was deposited in the dump truck. The dump truck hauled the soil from the berm area to the stockpile holding area adjacent to the SGS plant. As soils were excavated, an RCT surveyed the material in the loader bucket, as well as the excavated area, for beta/gamma radiation activity. This was done using a Ludlum Model 12 with a model 44-9 GM tube detector. During the course of the VCA, to ensure that the hand-held survey meter detectors were reading the same levels of pCi/g of

activity for a given soil sample as the SGS detectors, each was calibrated daily with a natural uranium standard source.

The RCT conducted the surveying to determine when a radiological work permit (RWP) needed to be obtained, and to segregate radioactively contaminated soil from nonradioactively contaminated soil. Soil continued to be removed until undisturbed native material was reached. A radiation survey was then conducted over the extent of the excavation using both the beta/gamma radiation detectors and sodium iodide detectors to ensure that all soil exceeding two times background radioactivity was removed. Any noted hotspots (exceeding two times background) were flagged with pin flags. The hot spots were removed using the front-end loader and shovels. Once the hot spots were removed, the RCT again surveyed those areas to confirm that no radioactive hotspots remained. The excavation was considered complete when the radiological survey showed that no radioactivity above the instrument background level remained in the area.

3.1.4 Sampling Activities

Eight footprint samples, two drainage samples, and seven processed verification samples were collected from PRS 33-007(b) (Table 3.1-1). Footprint and drainage sample locations are shown on Figure 3.1-1. The sample locations within the drainage were selected by Canyons Focus Area personnel, in accordance with Canyons' sampling strategy. In addition, drainage samples were collected at only one depth (0–0.5 ft) because the sediment was at the soil/tuff interface.

Table 3.1-1
Sampling Information for PRS 33-007(b)

Laboratory Sample ID	Location ID	Depth (ft)	Media	Sampling Location	Collection Method	Date Collected
RE33-99-0001	33-1700	0–0.5	Soil	NW quadrant	Spade and scoop	5/21/99
RE33-99-0002	33-1701	0–0.5	Soil	SE quadrant	Spade and scoop	5/21/99
RE33-99-0003	33-1702	0–0.5	Soil	NE quadrant	Spade and scoop	5/21/99
RE33-99-0004	33-1703	0–0.5	Soil	N quadrant	Spade and scoop	5/21/99
RE33-99-0043	33-1700	2.0–2.5	Qbt 3 Tuff	NW quadrant	Bosch hammer drill with auger	5/21/99
RE33-99-0044	33-1701	2.0–2.5	Qbt 3 Tuff	SE quadrant	Bosch hammer drill with auger	5/21/99
RE33-99-0045	33-1702	2.0–2.5	Qbt 3 Tuff	NE quadrant	Bosch hammer drill with auger	5/21/99
RE33-99-0046	33-1703	2.0–2.5	Qbt 3 Tuff	N quadrant	Bosch hammer drill with auger	5/21/99
RE33-99-0018	NA[a]	0[b]	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0019	NA	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0048	NA	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0049	NA	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0050	NA	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0051	NA	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0057	NA	0	Soil	Processed soil	Spade and scoop	5/27/99
RE33-99-0063	33-1718	0–0.5	Sediment	Top of drainage, west of road	Spade and scoop	6/8/99

Table 3.1-1 (continued)

Laboratory Sample ID	Location ID	Depth (ft)	Media	Sampling Location	Collection Method	Date Collected
RE33-99-0064	33-1719	0–0.5	Sediment	Drainage bottom, at intersection of Chaquehui Canyon	Spade and scoop	6/8/99

[a] NA = Not applicable.

[b] Note: Depths from 0 ft were collected from piles or directly from the SGS plant (they were not collected in place).

All samples were submitted for analysis of isotopic uranium. Footprint and drainage samples were also submitted for analysis of total metals. Samples collected from the processed material (which had been returned to the sites) were submitted for toxic characteristic leaching procedure (TCLP) metals analysis.

Table 3.1-2 lists all analytical samples and the analytical suites associated with each sample from PRS 33-007(b).

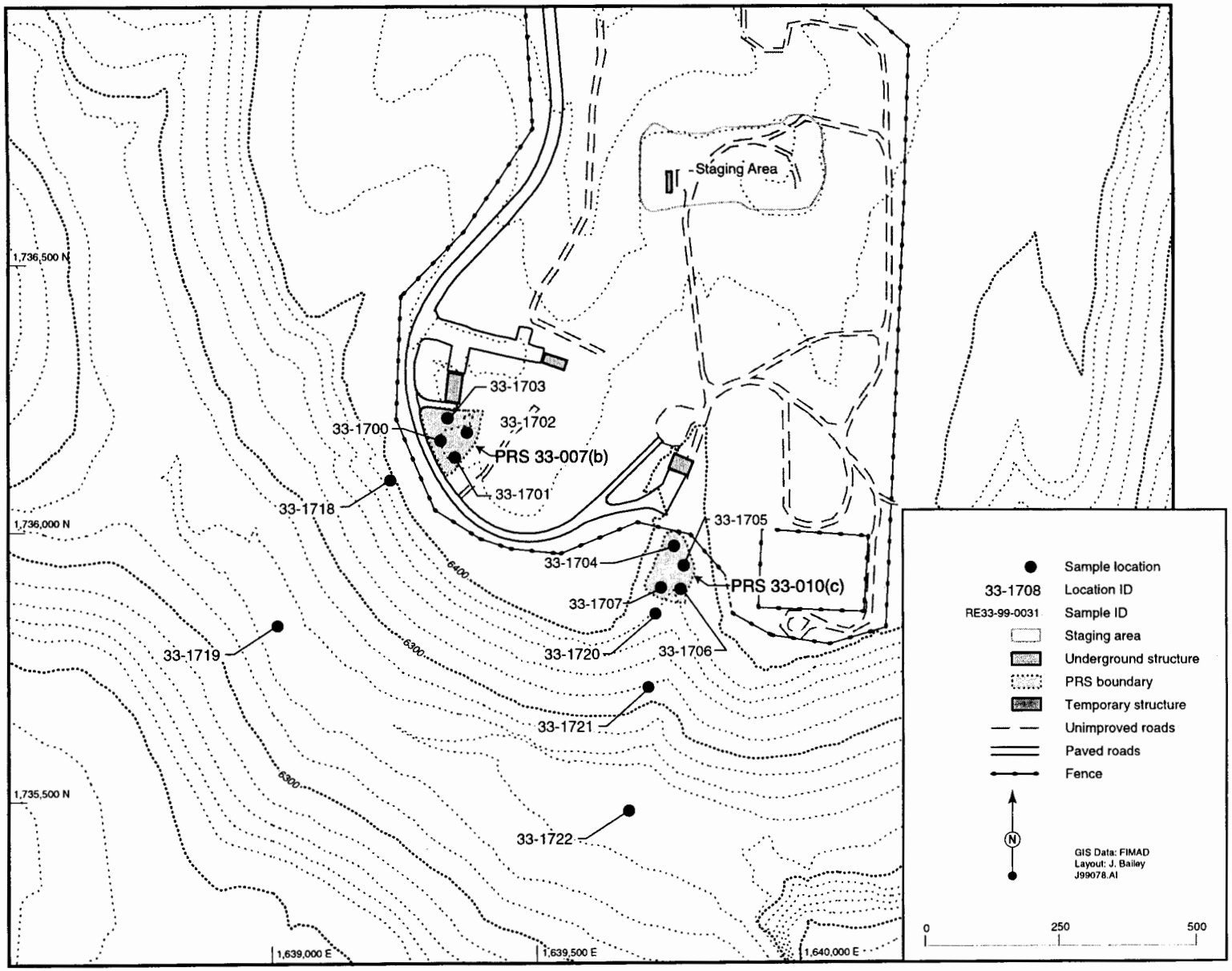

Figure 3.1-1. Footprint and drainage sampling locations at PRSs 33-007(b) and 33-010(c)

Table 3.1-2
Summary of PRS 33-007(b) Samples Collected for Fixed-Laboratory Analysis

Location ID	Sample ID	Sample Type	Depth (ft)	Media	Isotopic Uranium	Tritium	Inorganic Chemicals	SVOCs	Total Uranium	VOCs	PCBs[a]
33-1700	RE33-99-0043	Grab	2–2.5	Qbt 3	5608R	na[b]	5607R	na	na	na	na
33-1701	RE33-99-0044	Grab	2–2.5	Qbt 3	5608R	na	5607R	na	na	na	na
33-1702	RE33-99-0045	Grab	2–2.5	Qbt 3	5608R	na	5607R	na	na	na	na
33-1703	RE33-99-0046	Grab	2–2.5	Qbt 3	5608R	na	5607R	na	na	na	na
33-1700	RE33-99-0001	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na
33-1701	RE33-99-0002	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na
33-1702	RE33-99-0003	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na
33-1703	RE33-99-0004	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na
NA[c]	RE33-99-0018	Grab	0	Soil	5583R	na	na	na	na	na	na
NA	RE33-99-0019	Grab	0	Soil	5583R	na	na	na	na	na	na
NA	RE33-99-0048	Grab	0	Soil	5583R	na	na	na	na	na	na
NA	RE33-99-0049	Grab	0	Soil	5583R	na	na	na	na	na	na
NA	RE33-99-0050	Grab	0	Soil	5583R	na	na	na	na	na	na
NA	RE33-99-0051	Grab	0	Soil	5583R	na	na	na	na	na	na
NA	RE33-99-0057	Grab	0	Soil	5638R	na	na	na	na	na	na
33-1718	RE33-99-0063	Grab	0-0.5	Sed	5683R	na	5682R	na	na	na	na
33-1719	RE33-99-0064	Grab	0-0.5	Sed	5683R	na	5682R	na	na	na	na

[a] PCBs = Polychlorinated biphenyls.

[b] na = Not analyzed.

[c] NA = Not applicable.

3.1.5 Preliminary Results

Tables in this section include all detected values. All analytical results were validated by LANL's routine validation. All nonrejected data is usable for decision-making purposes and adequate to evaluate a potential release. Qualifiers on the data indicate if error or bias on the data must be considered when using the data. Qualified data are acceptable to use as long as the qualifications are considered.

3.1.5.1 Inorganic Chemical Comparison with BVs

Processed soil footprint and drainage samples were analyzed for the target analyzed list (TAL) metal suite (which includes uranium). BVs have been compared to the data based upon the media from which each sample was collected. Results for the preprocessed and footprint samples are compared to the LANL background data set for soils (Ryti et al. 1998, 59730). Results for the drainage samples are compared to LANL background data set for sediments (LANL 1998, 59730). Table 3.1-3 compares detected inorganic chemicals against their associated BVs for PRSs 33-007(b).

Table 3.1-3
Inorganic Chemicals with Concentrations Exceeding BVs in PRS 33-007(b) Samples

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)	BV (mg/kg)	Media	Depth (ft)
Antimony	33-1701	RE33-99-0044	0.76(U)[a]	0.5	Qbt 3	2–2.5
	33-1700	RE33-99-0043	0.78(U)	0.5	Qbt 3	2–2.5
	33-1702	RE33-99-0045	0.95(U)	0.5	Qbt 3	2–2.5
	33-1703	RE33-99-0046	1.4(U)	0.5	Qbt 3	2–2.5
Arsenic	33-1702	RE33-99-0045	3.4	2.79	Qbt 3	2–2.5
Barium	33-1701	RE33-99-0044	58.1	46	Qbt 3	2–2.5
	33-1703	RE33-99-0046	68.3	46	Qbt 3	2–2.5
	33-1702	RE33-99-0045	86.4	46	Qbt 3	2–2.5
Beryllium	33-1702	RE33-99-0045	1.4	1.21	Qbt 3	2–2.5
Cadmium	33-1700	RE33-99-0001	0.78	0.4	Soil	0–0.5
Calcium	33-1702	RE33-99-0045	2260	2200	Qbt 3	2–2.5
	33-1703	RE33-99-0046	2410	2200	Qbt 3	2–2.5
	33-1700	RE33-99-0043	2830	2200	Qbt 3	2–2.5
Cobalt	33-1702	RE33-99-0045	3.2	3.14	Qbt 3	2–2.5
	33-1703	RE33-99-0046	3.8	3.14	Qbt 3	2–2.5
Copper	33-1701	RE33-99-0044	6.8	4.66	Qbt 3	2–2.5
	33-1702	RE33-99-0045	8.1	4.66	Qbt 3	2–2.5
	33-1703	RE33-99-0046	18.6	4.66	Qbt 3	2–2.5
	33-1718	RE33-99-0063	15.5	11.2	Sediment	0–0.5
Lead	33-1700	RE33-99-0001	68.5(J-)[b]	22.3	Soil	0–0.5
Nickel	33-1701	RE33-99-0044	8.5	6.58	Qbt 3	2–2.5
	33-1702	RE33-99-0045	9.5	6.58	Qbt 3	2–2.5
	33-1703	RE33-99-0046	32.1	6.58	Qbt 3	2–2.5
	33-1718	RE33-99-0063	17.3	9.38	Sediment	0–0.5

Table 3.1-3 (continued)

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)	BV (mg/kg)	Media	Depth (ft)
Selenium	33-1700	RE33-99-0043	0.45(U)	0.3	Qbt 3	2–2.5
	33-1701	RE33-99-0044	0.46(U)	0.3	Qbt 3	2–2.5
	33-1702	RE33-99-0045	0.47(U)	0.3	Qbt 3	2–2.5
	33-1703	RE33-99-0046	2.1	0.3	Qbt 3	2–2.5
	33-1719	RE33-99-0064	0.44(U)	0.3	Sediment	0–0.5
	33-1718	RE33-99-0063	0.94	0.3	Sediment	0–0.5
Thallium	33-1701	RE33-99-0002	1.8	0.73	Soil	0–0.5

[a] U = The analyte was analyzed for but not detected above the reported estimated quantitation limit or sample detection limit.

[b] J- = The analyte was positively identified, and the result is likely biased low.

In PRS 33-007(b), arsenic, barium, beryllium, cadmium, calcium, cobalt, copper, lead, nickel, selenium, and thallium were detected at levels above BVs. Antimony and uranium were undetected, with detection limits above the BVs. The lead results were qualified as J- because the spike sample recovery was 63%, which is below the acceptable limit of 75%. These data should be considered as estimated with a low bias, indicating that the actual value could be up to 50% higher.

Silver, chromium, and zinc were not detected at levels above BVs in any of the samples.

3.1.5.2 Radionuclide Comparison with BV and/or Fallout Concentrations

Uranium was analyzed for at this PRS. BVs have been applied to the data based upon the media from which each sample was collected. Results for the processed and footprint samples were compared to LANL background data set for soils (LANL 1998, 59730). The isotopic ratios of the analytical results confirm the assumption that natural uranium is present at this site, not enriched or depleted uranium (Appendix A). Results for the drainage samples were compared to the LANL background data set for sediments (LANL 1998, 59730). Table 3.1-4 compares detected radioisotopes against their associated BVs for PRS 33-007(b).

Table 3.1-4
Radioisotopes with Concentrations Exceeding BVs in PRS 33-007(b) Samples

Analyte	Location ID	Sample ID	Sample Concentration (pCi/g)	BV (pCi/g)	Media	Depth (ft)
Uranium-234	NA[a]	RE33-99-0057	10.58	2.59	Soil	0
	NA	RE33-99-0049	3.25	2.59	Soil	0
	33-1700	RE33-99-0001	2.82	2.59	Soil	0–0.5
	33-1703	RE33-99-0004	7.35	2.59	Soil	0–0.5
	33-1703	RE33-99-0046	8.56	1.98	Qbt 3	2–2.5
Uranium-235	NA	RE33-99-0057	0.52	0.2	Soil	0
	NA	RE33-99-0049	0.268	0.2	Soil	0
	33-1703	RE33-99-0004	0.314	0.2	Soil	0–0.5
	33-1703	RE33-99-0046	0.457	0.09	Qbt 3	2–2.5
Uranium-238	NA	RE33-99-0057	11.05	2.29	Soil	0
	NA	RE33-99-0019	2.36	2.29	Soil	0
	NA	RE33-99-0049	3.26	2.29	Soil	0
	33-1700	RE33-99-0001	3.36	2.29	Soil	0–0.5
	33-1703	RE33-99-0004	7.15	2.29	Soil	0–0.5
	33-1703	RE33-99-0046	8.62	1.93	Qbt 3	2–2.5

[a] NA = Not applicable.

There were no quality problems associated with the uranium data and none of the uranium data are qualified as a result of quality issues.

3.2 PRS 33-010(C)

3.2.1 Description and Operational History

PRS 33-010(c) was a surface disposal area located 230 ft south of shot pad TA-33-26 at South Site. The disposal area received debris from firing activities at shot pad TA-33-26 [PRS 33-006(a)] and consisted of gravel, shrapnel (primarily copper and aluminum), shattered pieces of electric cable, and wood. The disposal area was approximately 50 x 40 x 30 ft. PRS 33-010(c) received uranium-contaminated shrapnel and other debris associated with experimental detonations and implosion studies conducted at shot pad TA-33-26 in the mid-1950s. Two or three shots per week were detonated; some contained more than 1000 lbs of high explosives (HE). The experimental apparatus and the HE were encased in a uranium container surrounded by neutron detectors on aluminum stands. To electrically isolate the experiment, the assemblage was placed in a large copper can. A wooden shack was built over the can prior to detonation. To prepare for the next experiment, the debris was scraped from the pad after the shots and placed at the surface disposal area at PRS 33-010(c) (LANL 1995, 51903.1; LANL, 1992, 7671.1). Other debris (and potential contamination) that was scattered from the shot experiments was addressed in previous investigations of PRS 33-006(a).

The east face of the disposal area sloped steeply into a tributary drainage of Chaquehui Canyon (LANL 1995, 51903.1). The surface water assessment conducted in accordance with LANL-ER-SOP-2.01, Surface Water Site Assessment, for PRS 33-010(c) generated an erosion matrix score (EMS) of 60.5, indicating the potential for erosion and contaminant migration to occur at the site.

3.2.2 Distribution of Contaminants

Based on the operational history of shot pad PRS 33-006(a) and on results of the previous investigation and characterization of PRS 33-010(c), uranium was determined to be the primary contaminant at this PRS and was present in concentrations above SALs. Uranium-contaminated shrapnel and metals were dispersed radially from the shot pad before the material was scraped into PRS 33-010(c). The vertical extent of contamination from the disposal are was not yet known because samples had not been collected from beneath the pile prior to the VCA. The lateral extent of uranium contamination had not been defined; however, sediment samples were collected within the drainage downgradient from the debris pile. Uranium was present at decreasing concentrations, but above background levels, with lateral distance down the drainage (LANL 1995, 51903.1). This indicated that contaminants were migrating.

3.2.3 Removal Activities

During VCA activities, BMPs were installed to minimize the potential impact of surface water runoff. At PRS 33-010(c), straw bale barriers were used on the down slope areas of soil disturbance and within the adjacent drainage channels and silt fences were provided at the toe of slope above the drainage channel.

Excavation of PRS 33-010(c) was conducted using an excavator to remove soil and debris from the slope and a front-end loader to deposit the material into the dump truck. The dump truck hauled the excavated soil and debris to the stockpile holding area adjacent to the SGS plant. The pile was then excavated down to undisturbed native material. Any large pieces of debris that remained on the site after excavation were removed, screened for radioactivity, and placed in either the industrial waste storage container or the radioactive waste storage container. A radiation survey was conducted over the extent of the excavation using both the beta/gamma radiation detectors and the sodium iodide detectors to ensure that all material exceeding 2 times background radioactivity was removed. The only hot spots (exceeding 2 times background) detected during the survey were associated with pieces of radioactive shrapnel. The radioactive shrapnel was removed and placed in the radioactive waste storage area; the areas were resurveyed. The excavation was considered complete once the radiological survey showed that no radioactivity above site-specific background (as detected using the direct reading instrument) remained at the site.

3.2.4 Sampling Activities

Eight footprint samples, three drainage samples, and six processed verification samples were collected from PRS 33-010(c) (Table 3.2-1). Footprint and drainage sample locations are shown on Figure 3.1-1. The sample locations within the drainage were selected by Canyons Focus Area personnel in accordance with Canyons' sampling strategy. Additionally, drainage samples were collected at only one depth (0–0.5 ft) because the sediment was at the soil/tuff interface.

All samples were submitted for analysis of isotopic uranium. Footprint and drainage samples were also submitted for analysis of total metals. Samples collected from the processed material (returned to the sites) were submitted for TCLP metals analysis.

Table 3.2-1
Sampling Information for PRS 33-010(c)

Laboratory Sample ID	Location ID	Depth (ft)	Media	Sampling Location	Collection Method	Date Collected
RE33-99-0005	33-1704	0–0.5	Soil	NW quadrant	Spade and scoop	5/24/99
RE33-99-0006	33-1705	0–0.5	Soil	NE quadrant	Spade and scoop	5/24/99
RE33-99-0007	33-1706	0–0.5	Soil	SE quadrant	Spade and scoop	5/24/99
RE33-99-0008	33-1707	0–0.5	Soil	SW quadrant	Spade and scoop	5/24/99
RE33-99-0039	33-1704	2.0–2.5	Qbt 3 Tuff	NW quadrant	Hand auger	5/24/99
RE33-99-0040	33-1705	2.0–2.5	Qbt 3 Tuff	NE quadrant	Hand auger	5/24/99
RE33-99-0041	33-1706	2.0–2.5	Qbt 3 Tuff	SE quadrant	Hand auger	5/24/99
RE33-99-0042	33-1707	2.0–2.5	Qbt 3 Tuff	SW quadrant	Hand auger	5/24/99
RE33-99-0021	N/A[a]	0[b]	Soil	Processed soil	Spade and scoop	5/10/99
RE33-99-0022	N/A	0	Soil	Processed soil	Spade and scoop	5/10/99
RE33-99-0047	N/A	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0052	N/A	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0053	N/A	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0054	N/A	0	Soil	Processed soil	Spade and scoop	5/17/99
RE33-99-0065	33-1720	0–0.5	Sediment	Upper drainage sample	Spade and scoop	6/8/99
RE33-99-0066	33-1721	0–0.5	Sediment	Middle drainage sample	Spade and scoop	6/8/99
RE33-99-0067	33-1722	0–0.5	Sediment	Drainage bottom sample	Spade and scoop	6/8/99

[a] NA = Not applicable.

[b] Note: Depths from 0 ft were collected from piles or directly from the SGS plant (they were not collected in place).

Table 3.2-2 lists all analytical samples and the analytical suites associated with each sample from PRS 33-010(c). HE was analyzed in the processed soils at PRS 33-010(c) to confirm the absence (based on previous sampling efforts).

Table 3.2-2
Summary of PRS 33-010(c) Samples Collected for Fixed-Laboratory Analysis

Location ID	Sample ID	Sample Type	Depth (ft)	Media	Isotopic Uranium	Tritium	Inorganic Chemicals	SVOCs	Total Uranium	VOCs	PCBs	HE[a]
33-1704	RE33-99-0039	Grab	2–2.5	Qbt 3	5608R	na[b]	5607R	na	na	na	na	na
33-1705	RE33-99-0040	Grab	2–2.5	Qbt 3	5608R	na	5607R	na	na	na	na	na
33-1706	RE33-99-0041	Grab	2–2.5	Qbt 3	5608R	na	5607R	na	na	na	na	na
33-1707	RE33-99-0042	Grab	2–2.5	Qbt 3	5608R	na	5607R	na	na	na	na	na
33-1704	RE33-99-0005	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na	na
33-1705	RE33-99-0006	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na	na
33-1706	RE33-99-0007	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na	na
33-1707	RE33-99-0008	Grab	0–0.5	Soil	5608R	na	5607R	na	na	na	na	na
NA[c]	RE33-99-0021	Grab	0	Soil	5558R	na	na	na	na	na	na	5556R
NA	RE33-99-0022	Grab	0	Soil	5558R	na	na	na	na	na	na	5556R
NA	RE33-99-0047	Grab	0	Soil	5583R	na	na	na	na	na	na	na
NA	RE33-99-0052	Grab	0	Soil	5583R	na	na	na	na	na	na	na
NA	RE33-99-0053	Grab	0	Soil	5583R	na	na	na	na	na	na	na
NA	RE33-99-0054	Grab	0	Soil	5583R	na	na	na	na	na	na	na
33-1720	RE33-99-0065	Grab	0	Soil	5683R	na	5682R	na	na	na	na	na
33-1721	RE33-99-0066	Grab	0	Soil	5683R	na	5682R	na	na	na	na	na
33-1722	RE33-99-0067	Grab	0	Soil	5683R	na	5682R	na	na	na	na	na

[a] HE = High explosives.

[b] na = Not analyzed.

[c] NA = Not applicable.

3.2.5 Preliminary Results

Tables in this section include all detected values. All analytical results were validated by LANL's routine validation. All nonrejected data is usable for decision-making purposes and adequate to evaluate a potential release. Qualifiers on the data indicate if error or bias on the data must be considered when using the data. Qualified data are acceptable to use as long as the qualifications are considered.

3.2.5.1 Inorganic Chemical Comparison with BVs

Footprint and drainage samples were analyzed for the target analyzed list (TAL) metal suite (which includes uranium). BVs have been compared to the data based upon the media from which each sample was collected. Results for the footprint samples are compared to the LANL background data set for soils (Ryti et al. 1998, 59730). Results for the drainage samples are compared to LANL background data set for sediments (LANL 1998, 59730). Table 3.2-3 compares detected inorganic chemicals against their associated BVs for PRS 33-010(c).

Table 3.2-3
Inorganic Chemicals with Concentrations Exceeding BVs in PRS 33-010(c) Samples

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)	BV (mg/kg)	Media	Depth (ft)
Antimony	33-1707	RE33-99-0008	0.83(U)[a]	0.83	Soil	0–0.5
	33-1706	RE33-99-0007	0.86(U)	0.83	Soil	0–0.5
	33-1705	RE33-99-0006	0.91(U)	0.83	Soil	0–0.5
	NA[b]	RE33-99-0020	28.4(J-)[c]	0.83	Soil	0
	33-1705	RE33-99-0040	0.74(U)	0.5	Qbt 3	2–2.5
	33-1707	RE33-99-0042	0.75(U)	0.5	Qbt 3	2–2.5
	33-1706	RE33-99-0041	0.77(U)	0.5	Qbt 3	2–2.5
	33-1704	RE33-99-0039	0.78(U)	0.5	Qbt 3	2–2.5
Barium	33-1720	RE33-99-0065	130	127	Sediment	0-0.5
	33-1707	RE33-99-0042	46.5	46	Qbt 3	2–2.5
	33-1705	RE33-99-0040	49.7	46	Qbt 3	2–2.5
	33-1706	RE33-99-0041	55.3	46	Qbt 3	2–2.5
Calcium	33-1707	RE33-99-0042	2550	2200	Qbt 3	2–2.5
	33-1705	RE33-99-0040	2870	2200	Qbt 3	2–2.5
	33-1706	RE33-99-0041	3480	2200	Qbt 3	2–2.5
Copper	33-1705	RE33-99-0006	44.7	14.7	Soil	0–0.5
	33-1704	RE33-99-0005	116	14.7	Soil	0–0.5
	NA	RE33-99-0020	743	14.7	Soil	0
	33-1722	RE33-99-0067	270	11.2	Sediment	0–0.5
	33-1721	RE33-99-0066	570	11.2	Sediment	0–0.5
	33-1720	RE33-99-0065	581	11.2	Sediment	0–0.5
	33-1704	RE33-99-0039	7.1	4.66	Qbt 3	2–2.5
	33-1707	RE33-99-0042	9.8	4.66	Qbt 3	2–2.5
Selenium	33-1722	RE33-99-0067	0.44(U)	0.3	Sediment	0–0.5
	33-1720	RE33-99-0065	0.46(U)	0.3	Sediment	0–0.5
	33-1721	RE33-99-0066	0.89	0.3	Sediment	0–0.5
	33-1705	RE33-99-0040	0.45(U)	0.3	Qbt 3	2–2.5
	33-1707	RE33-99-0042	0.46(U)	0.3	Qbt 3	2–2.5
	33-1706	RE33-99-0041	0.47(U)	0.3	Qbt 3	2–2.5
	33-1704	RE33-99-0039	0.48(U)	0.3	Qbt 3	2–2.5
Silver	33-1720	RE33-99-0065	84.6	1	Sediment	0-0.5
Uranium	NA	RE33-99-0020	50.8	1.82	Soil	0

[a] U = The analyte was analyzed for but not detected above the reported estimated quantitation limit or sample detection limit.

[b] NA = Not applicable.

[c] J- = The analyte was positively identified, and the result is likely biased low.

In PRS 33-010(c), barium, calcium, copper, silver, and total uranium were detected at levels above the BVs for soil and/or Qbt 3. Selenium and antimony were undetected but had detection limits above the BVs for soil and/or Qbt 3. Antimony results were qualified as J in one sample because the spike recovery

for antimony was 72%, which is slightly less than the acceptable limit of 75%. Otherwise, no other inorganics were qualified in the data associated with PRS 33-010(c) (Table 3.2-3). Lead and zinc were not detected at levels above BVs in any of these samples.

3.2.5.2 Radionuclide Comparison with BV and/or Fallout Concentrations

Uranium and tritium were the two radionuclides analyzed for at this PRS. BVs have been applied to the data based upon the media from which each sample was collected. Results for the processed and footprint samples were compared to LANL background data set for soils (LANL 1998, 59730). The isotopic ratios of the analytical results confirm the assumption that natural uranium is present at this site, not enriched or depleted uranium (Appendix A). Results for the drainage samples were compared to the LANL background data set for sediments (LANL 1998, 59730). Table 3.2-4 compares detected radioisotopes against their associated BVs for PRS 33-010(c).

Table 3.2-4
Radioisotopes with Concentrations Exceeding BVs in PRS 33-010(c) Samples

Analyte	Location ID	Sample ID	Sample Concentration (pCi/g)	BV (pCi/g)	Media	Depth (ft)
Uranium-234	NA[a]	RE33-99-0021	22	2.59	Soil	0
	NA	RE33-99-0052	21.4	2.59	Soil	0
	NA	RE33-99-0053	21.2	2.59	Soil	0
	NA	RE33-99-0022	19.4	2.59	Soil	0
	NA	RE33-99-0047	17.9	2.59	Soil	0
	NA	RE33-99-0054	17	2.59	Soil	0
	33-1705	RE33-99-0006	9.78	2.59	Soil	0–0.5
	33-1704	RE33-99-0005	4.62	2.59	Soil	0–0.5
	33-1707	RE33-99-0008	4.05	2.59	Soil	0–0.5
	33-1720	RE33-99-0065	16.3	2.59	Sediment	0–0.5
	33-1721	RE33-99-0066	13.7	2.59	Sediment	0–0.5
	33-1722	RE33-99-0067	4.86	2.59	Sediment	0–0.5
	33-1707	RE33-99-0042	2.71	1.98	Qbt 3	2–2.5
	33-1705	RE33-99-0040	7.62	1.98	Qbt 3	2–2.5
Uranium-235	33-1722	RE33-99-0067	0.3	0.2	Sediment	0–0.5
	33-1720	RE33-99-0065	0.76	0.2	Sediment	0–0.5
	33-1721	RE33-99-0066	0.785	0.2	Sediment	0–0.5
	NA	RE33-99-0022	0.83	0.2	Soil	0
	NA	RE33-99-0047	0.84	0.2	Soil	0
	NA	RE33-99-0054	0.864	0.2	Soil	0
	NA	RE33-99-0021	1.087	0.2	Soil	0
	NA	RE33-99-0052	1.12	0.2	Soil	0
	NA	RE33-99-0053	1.173	0.2	Soil	0
	33-1707	RE33-99-0008	0.221	0.2	Soil	0–0.5
	33-1704	RE33-99-0005	0.269	0.2	Soil	0–0.5
	33-1705	RE33-99-0006	0.5	0.2	Soil	0–0.5
	33-1706	RE33-99-0041	0.099(U)[b]	0.09	Qbt 3	2–2.5
	33-1704	RE33-99-0039	0.116	0.09	Qbt 3	2–2.5
	33-1707	RE33-99-0042	0.15	0.09	Qbt 3	2–2.5
	33-1705	RE33-99-0040	0.35	0.09	Qbt 3	2–2.5

Table 3.2-4 (continued)

Analyte	Location ID	Sample ID	Sample Concentration (pCi/g)	BV (pCi/g)	Media	Depth (ft)
Uranium-238	33-1722	RE33-99-0067	5.57	2.29	Sediment	0–0.5
	33-1721	RE33-99-0066	14.35	2.29	Sediment	0–0.5
	33-1720	RE33-99-0065	17.2	2.29	Sediment	0–0.5
	NA	RE33-99-0047	18.4	2.29	Soil	0
	NA	RE33-99-0054	19.5	2.29	Soil	0
	NA	RE33-99-0022	21.1	2.29	Soil	0
	NA	RE33-99-0021	23.5	2.29	Soil	0
	NA	RE33-99-0053	23.8	2.29	Soil	0
	NA	RE33-99-0052	24.4	2.29	Soil	0
	33-1707	RE33-99-0008	3.94	2.29	Soil	0–0.5
	33-1704	RE33-99-0005	4.54	2.29	Soil	0–0.5
	33-1705	RE33-99-0006	9.41	2.29	Soil	0–0.5
	33-1707	RE33-99-0042	2.57	1.93	Qbt 3	2–2.5
	33-1705	RE33-99-0040	7.67	1.93	Qbt 3	2–2.5

[a] NA = Not applicable.

[b] U = The analyte was analyzed for but not detected above the reported estimated quantitation limit or sample detection limit.

3.3. PRS C-33-003

3.3.1 Description and Operational History

PRS C-33-003 consisted of two fill areas that were geographically separated [C-33-003 (west) and C-33-003(east)] at Main Site (Figure 1.0-2). Fill was used to level and grade two areas where portable trailers (TA-33-169 and TA-33-170) were located from 1984 to 1988. Projectiles had been fired into the cinder cone prior to its material being excavated and used as fill material. The trailers that had been placed on the fill material were removed in March 1988. Once the trailers were removed, the areas were left without any further improvements. During brush-clearing activities conducted in the spring of 1996, three projectiles (up to 2-ft long) were discovered at C-33-003 (west). Further observations revealed that one of the three projectiles was radioactively contaminated (containing greater than two times the site-specific background). The basaltic cinder fill material was originally excavated from a cinder cone within the boundaries of PRS 33-007(c). The fill was known to contain uranium particles and solid metal projectiles up to 2 ft long. C-33-003 (west) is located next to a water tower and was approximately 100 ft long x 100 ft wide x 2 ft deep. C-33-003 (east) is located inside the northwest corner of the security area north of Building TA-33-114. It was approximately 70 ft long x 90 ft wide x 4 ft deep.

Surface water concerns at C-33-003 (west) included visible evidence of cinder material migrating into a small drainage channel on the western boundary of the PRS. This drainage channel is a tributary of Chaquehui Canyon. The surface water assessment conducted in accordance with LANL-ER-SOP-2.01, Surface Water Site Assessment, for PRS 33-010(c) generated an EMS of 59 reflects the erosion concerns present at C-33-003 (west). A potential for erosion and contaminant migration exists at C-33-003 (east), which received an EMS of 35.5.

3.3.2 Distribution of Contaminants

One uranium-contaminated projectile and several nonradioactive projectiles were discovered at C-33-003 (west), near the water tower in 1996. These projectiles were identical to those found within the cinder at PRS 33-007(c) at Area 6. Both areas that make up PRS C-33-003 (east and west) contained cinder material excavated from the vicinity of PRS 33-007(c).The cinder material within PRS 33-007(c) firing site has previously been recommended for NFA. A geophysical survey of both areas indicated that projectiles could be present within the fill material (ICF Kaiser 1997, 62892). Because no sampling had been conducted at this PRS, the vertical and lateral extents of potential contamination were not known prior to beginning the VCA. A small drainage leads southwest from the western boundary of C-33-003 (west), and some cinder has migrated down the drainage. There was no evidence of cinder migration at C-33-003 (east) because it is situated in a relatively level area.

3.3.3 Removal Activities

During VCA activities, BMPs were installed to minimize the potential impact of surface water runoff. At PRS C-33-003 (west and east), straw bale barriers were used on the down slope areas of soil disturbance. At PRS C-33-003(west), straw bale barriers were also used within the adjacent drainage channels.

Excavation of both parts of PRS C-33-003 was conducted using a bulldozer to scrape the cinder and soil down to native material and then a front-end loader to deposit the soil into a dump truck. The dump truck hauled the soil from each part to the staging area adjacent to the SGS plant. (Soils from both parts of PRS C-33-003 were combined at the staging area.) Both areas were excavated down to native soil and tuff, which was evident by the color difference between the cinder material and the grayish-tan native soil and tuff. A radiation survey of both areas was conducted using beta/gamma radiation detectors and sodium iodide detectors. There were no areas of radiation exceeding 2 times background remaining in the soil, and the excavation was considered complete.

3.3.4 Sampling Activities

Sixteen footprint samples, two drainage samples, and three processed verification samples were collected from PRS C-33-003 (Table 3.3-1). Footprint and drainage sample locations are shown on Figure 3.3-1. The sample locations within the drainage were selected by Canyons Focus Area personnel in accordance with Canyons' sampling strategy. Drainage samples were not collected from C-33-003(east) because there is no drainage channel adjacent to the site. Additionally, drainage samples were collected at only one depth (0–0.5 ft) because as the sediment was at the soil/tuff interface.

All samples were submitted for analysis of isotopic uranium. Footprint and drainage samples were also submitted for analysis of total metals. Samples collected from the processed material (returned to the sites) were submitted for TCLP metals analysis.

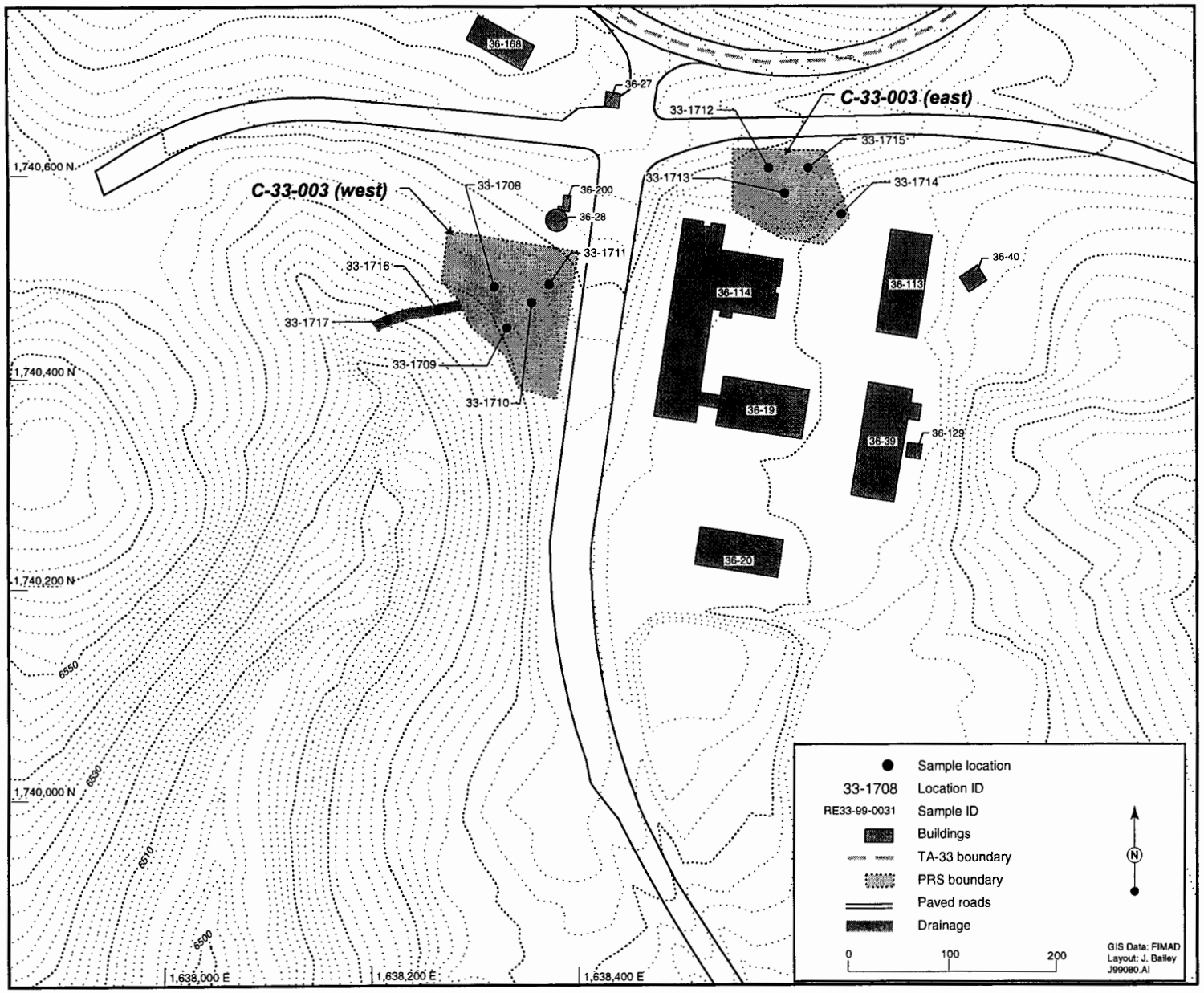

Figure 3.3-1. Footprint and drainage sampling locations at PRS C-33-003

Table 3.3-1
Sampling Information for PRS C-33-003

Laboratory Sample ID	Location ID	Depth (ft)	Media	Sample Location	Collection Method	Date Collected
RE33-99-0023	N/A[a]	0[b]	Soil	Processed	Grab with spade and scoop	5/10/99
RE33-99-0025	N/A	0	Soil	Processed	Grab with spade and scoop	5/10/99
RE33-99-0026	N/A	0	Soil	Processed	Grab with spade and scoop	5/3/99
RE33-99-0061	33-1716	0–0.5	Sediment	Upper drainage	Spade and scoop	6/8/99
RE33-99-0062	33-1717	0–0.5	Sediment	Lower drainage	Spade and scoop	6/8/99
C-33-003 West						
RE33-99-0009	33-1708	2.0–2.5	Qbt 3 Tuff	NW quadrant	Bosch hammer drill with auger	6/7/99
RE33-99-0010	33-1709	0–0.5	Soil/tuff	SW quadrant	Spade and scoop	5/12/99
RE33-99-0011	33-1710	0–0.5	Soil/tuff	SE quadrant	Spade and scoop	5/12/99
RE33-99-0012	33-1711	0–0.30	Soil/tuff	NE quadrant	Spade and scoop	5/12/99
RE33-99-0031	33-1708	0–0.5	Soil/tuff	NW quadrant	Spade and scoop	5/12/99
RE33-99-0032	33-1709	2.0–2.5	Qbt 3 Tuff	SW quadrant	Bosch hammer drill with auger	6/7/99
RE33-99-0033	33-1710	2.0–2.5	Qbt 3 Tuff	SE quadrant	Bosch hammer drill with auger	6/7/99
RE33-99-0034	33-1711	2.0–2.5	Qbt 3 Tuff	NE quadrant	Bosch hammer drill with auger	6/7/99
C-33-003 East						
RE33-99-0013	33-1712	0–0.5	Soil/tuff	NW quadrant	Spade and scoop	5/12/99
RE33-99-0014	33-1713	0–0.5	Soil/tuff	SW quadrant	Spade and scoop	5/12/99
RE33-99-0015	33-1714	0–0.5	Soil/tuff	SE quadrant	Spade and scoop	5/12/99
RE33-99-0016	33-1715	0–0.5	Soil/tuff	NE quadrant	Spade and scoop	5/12/99
RE33-99-0035	33-1712	2.0–2.5	Qbt 3 Tuff	NW quadrant	Bosch Hammer Drill with Auger	6/7/99
RE33-99-0036	33-1713	2.0–2.5	Qbt 3 Tuff	SW quadrant	Bosch Hammer Drill with Auger	6/7/99
RE33-99-0037	33-1714	2.0–2.5	Qbt 3 Tuff	SE quadrant	Bosch Hammer Drill with Auger	6/7/99
RE33-99-0038	33-1715	2.0–2.5	Qbt 3 Tuff	NE quadrant	Bosch Hammer Drill with Auger	6/7/99

[a] N/A = Not applicable.

[b] Note: Depths from 0 ft were collected from piles or directly from the SGS plant (they were not collected in place).

Table 3.3-2 lists all analytical samples and the analytical suites associated with each sample from PRS C-33-003.

Table 3.3-2
Summary of PRS C-33-003 Samples Collected for Fixed-Laboratory Analysis

Location ID	Sample ID	Sample Type	Depth (ft)	Media	Isotopic Uranium	Tritium	Inorganic Chemicals	SVOCs	Total Uranium	VOCs	PCBs
33-1708	RE33-99-0009	Grab	2–2.5	Qbt 3	5653R	na[a]	5652R	5651R	na	5651R	na
33-1709	RE33-99-0032	Grab	2–2.5	Qbt 3	5653R	na	5652R	5651R	na	5651R	na
33-1710	RE33-99-0033	Grab	2–2.5	Qbt 3	5653R	na	5652R	5651R	na	5651R	na
33-1711	RE33-99-0034	Grab	2–2.5	Qbt 3	5653R	na	5652R	5651R	na	5651R	na
33-1712	RE33-99-0035	Grab	2–2.5	Qbt 3	5653R	na	5652R	5651R	na	5651R	na
33-1713	RE33-99-0036	Grab	2–2.5	Qbt 3	5653R	na	5652R	5651R	na	5651R	na
33-1714	RE33-99-0037	Grab	2–2.5	Qbt 3	5653R	na	5652R	5651R	na	5651R	na
33-1715	RE33-99-0038	Grab	2–2.5	Qbt 3	5653R	na	5652R	5651R	na	5651R	na
33-1709	RE33-99-0010	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
33-1710	RE33-99-0011	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
33-1711	RE33-99-0012	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
33-1712	RE33-99-0013	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
33-1713	RE33-99-0014	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
33-1714	RE33-99-0015	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
33-1715	RE33-99-0016	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
NA[b]	RE33-99-0023	Grab	0	Soil	na	5519R	5518R	5517R	5518R	5517R	5517R
NA	RE33-99-0025	Grab	0	Soil	5558R	na	na	5555R	na	5555R	na
NA	RE33-99-0026	Grab	0	Soil	na	5519R	5518R	5517R	5518R	5517R	5517R
33-1708	RE33-99-0031	Grab	0–0.5	Soil	5579R	na	5578R	5577R	na	5570R	na
33-1716	RE33-99-0061	Grab	0-0.5	Sed	5683R	na	5682R	na	na	na	na
33-1717	RE33-99-0062	Grab	0-0.5	Sed	5683R	na	5682R	na	na	na	na

[a] na = Not analyzed.

[b] NA = Not applicable.

3.3.5 Preliminary Results

Tables in this section include all detected values. All analytical results were validated by LANL's routine validation. All nonrejected data is usable for decision-making purposes and adequate to evaluate a potential release. Qualifiers on the data indicate if error or bias on the data must be considered when using the data. Qualified data are acceptable to use as long as the qualifications are considered.

3.3.5.1 Inorganic Chemical Comparison with BVs

Footprint and drainage samples were analyzed for the target analyzed list (TAL) metal suite (which includes total uranium). BVs have been compared to the data based upon the media from which each sample was collected. Results for the footprint samples are compared to the LANL background data set for soils (Ryti et al. 1998, 59730). Results for the drainage samples are compared to LANL background data set for sediments (LANL 1998, 59730). Table 3.3-3 compares detected inorganic chemicals against their associated BVs for PRS C-33-003.

Table 3.3-3
Inorganic Chemicals with Concentrations Exceeding BVs in PRS C-33-003 Samples

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)	BV (mg/kg)	Media	Depth (ft)
Antimony	33-1710	RE33-99-0011	0.87(U)[a]	0.83	Soil	0–0.5
	33-1711	RE33-99-0012	0.93(U)	0.83	Soil	0-0.3
	33-1713	RE33-99-0014	1(U)	0.83	Soil	0–0.5
	33-1715	RE33-99-0016	1(U)	0.83	Soil	0–0.5
	33-1714	RE33-99-0015	1.1(U)	0.83	Soil	0–0.5
	33-1708	RE33-99-0031	1.3(U)	0.83	Soil	0–0.5
	33-1712	RE33-99-0013	1.6(U)	0.83	Soil	0–0.5
	33-1709	RE33-99-0010	2(U)	0.83	Soil	0–0.5
	33-1716	RE33-99-0061	0.83	0.83	Sediment	0–0.5
	33-1717	RE33-99-0062	1	0.83	Sediment	0–0.5
	33-1709	RE33-99-0032	0.74(U)	0.5	Qbt 3	2-2.5
	33-1710	RE33-99-0033	0.74(U)	0.5	Qbt 3	2-2.5
	33-1713	RE33-99-0036	0.74(U)	0.5	Qbt 3	2-2.5
	33-1708	RE33-99-0009	0.75(U)	0.5	Qbt 3	2-2.5
	33-1711	RE33-99-0034	0.75(U)	0.5	Qbt 3	2-2.5
	33-1714	RE33-99-0037	0.75(U)	0.5	Qbt 3	2-2.5
	33-1712	RE33-99-0035	0.77(U)	0.5	Qbt 3	2-2.5
	33-1715	RE33-99-0038	0.78(U)	0.5	Qbt 3	2-2.5
Barium	33-1717	RE33-99-0062	173	127	Sediment	0–0.5
	33-1715	RE33-99-0038	48.1	46	Qbt 3	2-2.5
	33-1714	RE33-99-0037	49.9	46	Qbt 3	2-2.5
	33-1713	RE33-99-0036	51	46	Qbt 3	2-2.5
	33-1711	RE33-99-0034	58.8	46	Qbt 3	2-2.5
	33-1708	RE33-99-0009	83.9	46	Qbt 3	2-2.5
Calcium	NA[b]	RE33-99-0026	6170	6120	Soil	0–0.5
	33-1711	RE33-99-0012	6680	6120	Soil	0-0.3
	33-1715	RE33-99-0016	9230	6120	Soil	0–0.5
	33-1712	RE33-99-0013	9300	6120	Soil	0–0.5
	33-1717	RE33-99-0062	5860	4420	Sediment	0–0.5
	33-1708	RE33-99-0009	2310	2200	Qbt 3	2-2.5
	33-1715	RE33-99-0038	2570	2200	Qbt 3	2-2.5

Table 3.3-3 (continued)

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)	BV (mg/kg)	Media	Depth (ft)
Cobalt	33-1715	RE33-99-0016	9.4	8.64	Soil	0–0.5
	33-1709	RE33-99-0010	9.5	8.64	Soil	0–0.5
	33-1711	RE33-99-0012	9.5	8.64	Soil	0–0.5
	33-1712	RE33-99-0013	11.9	8.64	Soil	0–0.5
	33-1716	RE33-99-0061	6	4.73	Sediment	0–0.5
	33-1717	RE33-99-0062	7	4.73	Sediment	0–0.5
	33-1708	RE33-99-0009	3.2	3.14	Qbt 3	2–2.5
Copper	33-1715	RE33-99-0016	15.5	14.7	Soil	0–0.5
	NA	RE33-99-0023	17.5	14.7	Soil	0
	33-1709	RE33-99-0010	18	14.7	Soil	0–0.5
	33-1712	RE33-99-0013	18.7	14.7	Soil	0–0.5
	33-1711	RE33-99-0012	18.9	14.7	Soil	0–0.5
	33-1716	RE33-99-0061	14.9	11.2	Sediment	0–0.5
	33-1717	RE33-99-0062	27.6	11.2	Sediment	0–0.5
	33-1715	RE33-99-0038	5	4.66	Qbt 3	2–2.5
	33-1712	RE33-99-0035	5.5	4.66	Qbt 3	2–2.5
	33-1713	RE33-99-0036	5.6	4.66	Qbt 3	2–2.5
	33-1714	RE33-99-0037	5.6	4.66	Qbt 3	2–2.5
	33-1709	RE33-99-0032	5.7	4.66	Qbt 3	2–2.5
	33-1710	RE33-99-0033	5.9	4.66	Qbt 3	2–2.5
	33-1711	RE33-99-0034	8.8	4.66	Qbt 3	2–2.5
	33-1708	RE33-99-0009	18.9	4.66	Qbt 3	2–2.5
Lead	33-1708	RE33-99-0031	25.7	22.3	Soil	0–0.5
	33-1716	RE33-99-0061	20.9	19.7	Sediment	0–0.5
	33-1717	RE33-99-0062	34.7	19.7	Sediment	0–0.5
	33-1708	RE33-99-0009	12.5	11.2	Qbt 3	2–2.5
	33-1711	RE33-99-0034	13.6	11.2	Qbt 3	2–2.5
Magnesium	33-1713	RE33-99-0014	4760	4610	Soil	0–0.5
	33-1714	RE33-99-0015	5030	4610	Soil	0–0.5
	NA	RE33-99-0023	5480	4610	Soil	0
	NA	RE33-99-0026	5500	4610	Soil	0–0.5
	33-1711	RE33-99-0012	6850	4610	Soil	0–0.3
	33-1709	RE33-99-0010	6860	4610	Soil	0–0.5
	33-1715	RE33-99-0016	7810	4610	Soil	0–0.5
	33-1712	RE33-99-0013	10,500	4610	Soil	0–0.5
	33-1716	RE33-99-0061	3470	2370	Sediment	0–0.5
	33-1717	RE33-99-0062	4160	2370	Sediment	0–0.5

Table 3.3-3 (continued)

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)	BV (mg/kg)	Media	Depth (ft)
Nickel	33-1714	RE33-99-0015	21.9	15.4	Soil	0–0.5
	33-1713	RE33-99-0014	24.8	15.4	Soil	0–0.5
	NA	RE33-99-0026	25.7	15.4	Soil	0–0.5
	33-1715	RE33-99-0016	32.1	15.4	Soil	0–0.5
	NA	RE33-99-0023	35.4	15.4	Soil	0
	33-1709	RE33-99-0010	36.8	15.4	Soil	0–0.5
	33-1712	RE33-99-0013	43.6	15.4	Soil	0–0.5
	33-1711	RE33-99-0012	44.5	15.4	Soil	0–0.3
	33-1716	RE33-99-0061	18.9	9.38	Sediment	0–0.5
	33-1717	RE33-99-0062	28.9	9.38	Sediment	0–0.5
Selenium	33-1710	RE33-99-0011	4.9	1.52	Soil	0–0.5
	33-1716	RE33-99-0061	1.1	0.3	Sediment	0–0.5
	33-1717	RE33-99-0062	1.8	0.3	Sediment	0–0.5
	33-1709	RE33-99-0032	0.45(U)	0.3	Qbt 3	2–2.5
	33-1713	RE33-99-0036	0.45(U)	0.3	Qbt 3	2–2.5
	33-1710	RE33-99-0033	0.46(U)	0.3	Qbt 3	2–2.5
	33-1711	RE33-99-0034	0.46(U)	0.3	Qbt 3	2–2.5
	33-1714	RE33-99-0037	0.46(U)	0.3	Qbt 3	2–2.5
	33-1712	RE33-99-0035	0.47(U)	0.3	Qbt 3	2–2.5
	33-1715	RE33-99-0038	0.62	0.3	Qbt 3	2–2.5
	33-1708	RE33-99-0009	0.8	0.3	Qbt 3	2–2.5
Uranium	NA	RE33-99-0023	22.3(U)	1.82	Soil	0
	NA	RE33-99-0026	22.7(U)	1.82	Soil	0–0.5

[a] U = The analyte was analyzed for but not detected above the reported estimated quantitation limit or sample detection limit.

[b] NA = Not applicable.

At PRS C-33-003, barium, calcium, cobalt, copper, lead, magnesium, nickel, and selenium were detected at levels above the BVs. Antimony was undetected, with detection limits above the BV. Antimony results were qualified as UJ due to poor duplicate recovery and matrix spike results of 72% and 65%, which are below the acceptable limit of 75%. In addition, antimony was present in the blank associated with request number 5578R. As a result, antimony results should be considered qualified as UJ (Table 3.3-3). Arsenic, beryllium, silver, and zinc were not detected at levels above BVs in any of these samples.

3.3.5.2 Radionuclide Comparison with BV and/or Fallout Concentrations

Uranium and tritium were the two radionuclides analyzed for at these three PRSs. BVs have been applied to the data based upon the media from which each sample was collected. Results for the footprint samples were compared to LANL background data set for soils (LANL 1998, 59730). The isotopic ratios of the analytical results confirm the assumption that natural uranium is present at this site, not enriched or

depleted uranium (Appendix A). Results for the drainage samples were compared to the LANL background data set for sediments (LANL 1998, 59730). Table 3.3-4 compares detected radioisotopes against their associated BVs for PRS C-33-003.

Table 3.3-4
Radioisotopes with Concentrations Exceeding BVs in PRS C-33-003 Samples

Analyte	Location ID	Sample ID	Sample Concentration (pCi/g)	BV (pCi/g)	Media	Depth (ft)
Tritium	NA[a]	RE33-99-0023	0.3	0.084	Soil	0
	NA	RE33-99-0026	0.59	0.084	Soil	0–0.5
Uranium-234	NA	RE33-99-0025	2.81	2.59	Soil	0
	33-1711	RE33-99-0012	3.83	2.59	Soil	0–0.3
	33-1709	RE33-99-0010	4.67	2.59	Soil	0–0.5
	33-1708	RE33-99-0031	2.78	2.59	Soil	0–0.5
Uranium-238	NA	RE33-99-0025	2.86	2.29	Soil	0
	33-1711	RE33-99-0012	3.83	2.29	Soil	0–0.3
	33-1709	RE33-99-0010	4.86	2.29	Soil	0–0.5
	33-1708	RE33-99-0031	3.06	2.29	Soil	0–0.5

[a] NA = Not applicable.

Two samples were analyzed for tritium content. In these samples, tritium levels were above the LANL BV. It is not surprising that TA-33 would have a higher local BV for tritium because there is a tritium-processing facility at this technical area.

There were no quality problems associated with the uranium data and none of the uranium data are qualified as a result of quality issues.

3.3.5.3 Evaluation of Organic Chemicals

SVOC and VOC analyses were conducted on the footprint samples from PRS C-33-003. Results were compared to contract-required EQLs (LANL 1998, 59730). Table 3.3-5 lists the detected organic compounds at PRS C-33-003.

Table 3.3-5
Detected Organic Chemicals in PRS C-33-003 Samples

Analyte	Location ID	Sample ID	Sample Concentration (mg/kg)	Media	Depth (ft)
Anthracene	33-1714	RE33-99-0015	0.93(J)	Soil	0–0.5
Aroclor-1254	NA[a]	RE33-99-0023	0.014(J)	Soil	0
Aroclor-1260	NA	RE33-99-0026	0.0088(J)	Soil	0–0.5
Benzene	33-1712	RE33-99-0013	0.00085(J)	Soil	0–0.5
Benzo(a)anthracene	NA	RE33-99-0026	0.61	Soil	0–0.5
	33-1714	RE33-99-0015	1.5(J)	Soil	0–0.5
Benzo(a)pyrene	NA	RE33-99-0026	0.49	Soil	0–0.5
	33-1714	RE33-99-0015	1.2(J)	Soil	0–0.5
Benzo(b)fluoranthene	NA	RE33-99-0026	0.39	Soil	0–0.5
	33-1714	RE33-99-0015	0.99(J)	Soil	0–0.5
Benzo(g,h,i)perylene	33-1714	RE33-99-0015	0.5(J)	Soil	0–0.5
Benzo(k)fluoranthene	NA	RE33-99-0026	0.46	Soil	0–0.5
	33-1714	RE33-99-0015	1.2(J)	Soil	0–0.5
Bis(2-ethylhexyl)phthalate	33-1711	RE33-99-0034	0.06(J)	Qbt 3	2–2.5
Chrysene	NA	RE33-99-0026	0.59	Soil	0–0.5
	33-1714	RE33-99-0015	1.5(J)	Soil	0–0.5
Di-n-butylphthalate	NA	RE33-99-0023	0.59	Soil	0
Fluoranthene	33-1712	RE33-99-0035	0.065(J)	Qbt 3	2–2.5
	33-1715	RE33-99-0016	0.7	Soil	0–0.5
	NA	RE33-99-0026	1.6	Soil	0–0.5
	33-1714	RE33-99-0015	3.3(J)	Soil	0–0.5
	NA	RE33-99-0025	0.48(J)	Soil	0
Fluorene	33-1714	RE33-99-0015	0.47(J)	Soil	0–0.5
Indeno(1,2,3-cd)pyrene	33-1714	RE33-99-0015	0.5(J)	Soil	0–0.5
Phenanthrene	33-1715	RE33-99-0016	0.52	Soil	0–0.5
	NA	RE33-99-0026	1.4	Soil	0–0.5
	33-1714	RE33-99-0015	3(J)	Soil	0–0.5
Pyrene	33-1712	RE33-99-0035	0.064(J)	Qbt 3	2–2.5
	33-1715	RE33-99-0016	0.71	Soil	0–0.5
	NA	RE33-99-0026	1.4	Soil	0–0.5
	33-1714	RE33-99-0015	4(J)	Soil	0–0.5
	33-1713	RE33-99-0014	0.41(J)	Soil	0–0.5
	NA	RE33-99-0025	0.52(J)	Soil	0
Toluene	NA	RE33-99-0025	0.0013(J)	Soil	0
Trichloroethene	33-1709	RE33-99-0010	0.00045(J)	Soil	0–0.5
	33-1711	RE33-99-0012	0.00062(J)	Soil	0–0.3
	33-1713	RE33-99-0014	0.00067(J)	Soil	0–0.5

[a] NA = Not applicable.

SVOCs

Several different SVOCs were detected in a number of samples. However, almost all detected SVOCs were polyaromatic hydrocarbons (PAHs), which are associated with asphalt runoff and phthalates and which are common laboratory contaminants.

Phthalates are common laboratory contaminants because they are found in plastics used for analysis (Smith 1997, 58478). Sample RE33-99-0023 contained small amounts of di-n-butylphthalate and sample RE33-99-0034 contained a small amount of bis-2-ethylhexyl phthalate. Although these contaminants were not found in the blanks, it is likely that these compounds came from the analytical process. There is no evidence that these chemicals were used at TA-33 for site activities.

Samples RE33-99-0025, -0026, -0035, -0015, and -0016 all contained levels of PAHs below 5000 mg/kg. The detected results associated with sample RE33-99-0015 were qualified as J, and undetected results were qualified as UJ because one internal standard was below the acceptable limit of 50% (by less than 1%). Similarly, detected results associated with sample RE33-99-0025 were qualified as J, and undetected results were qualified as UJ, because one internal standard was below the acceptable limit of 50% (by 5%). All other samples listed above were not qualified. Samples RE33-99-0015 and -0016 are located in the footprint of C-33-003(east) at the surface, and sample RE33-99-0035 was taken in the tuff. Sample RE33-99-0026 was collected from processed soils associated with C-33-003(east). Sample RE33-99-0025 was collected from processed soils associated with C-33-003(west). It is not surprising to find PAHs in samples associated with this PRS because this PRS receives runoff from upgradient asphalt paving. PAHs are often found in asphalt and could be transported in runoff. There is no evidence that PAHs were used at this PRS; therefore, the PAH contamination should be attributed to asphalt runoff.

Several undetected analytes in samples RE33-99-0014, RE33-99-0017, and RE33-99-0020 (in requests 5555R and 5577R) were qualified as UJ, indicating the compound was not detected but that there may be uncertainty in the detection limit reported. The UJ qualifier was most commonly applied because an internal standard result was below the acceptable level of 50%. For sample RE33-99-0014, one internal standard was 38%.

VOCs

Several VOCs were detected in samples. The following were all detected in at least one sample: acetone, benzene, naphthalene, toluene, trichloroethene, and 1,2-xylene.

Acetone is a common laboratory contaminant and was found in the laboratory blank associated with several VOC samples. When a laboratory contaminant is found in a blank and a sample, the contaminant in the sample is sometimes qualified as undetected. Acetone was found in the blanks associated with samples RE33-99-0011 and RE33-99-0031, both of which were collected at PRS C-33-003. Because the amount in the samples was so much more than the amount reported in the blank, the acetone was reported as detected. However, focused validation of the data indicated that most of the samples in this request (5570R) had very poor chromatographic backgrounds in the region sensitive to acetone. Samples RE33-99-0011 and RE33-99-0031 both had very good backgrounds in this region, allowing for better measurement of acetone. When the chromatograms associated with samples RE33-99-0011 and RE33-99-0031 were compared to the blank chromatograms, no major acetone contamination was visible. Therefore, all acetone detected in these samples will be attributed to laboratory contamination confounded by poor spectra.

Benzene was present in sample RE33-99-0013 from PRS C-33-003 at levels below the contract-required detection limit (CRDL); therefore, the result is qualified as J, indicating that the value is more uncertain

than other data because the concentration is so low. Although no field blank was submitted with these samples, it is possible that the benzene was present in the sample because of contamination from field equipment. Benzene is a component of engine exhaust.

Naphthalene was present in sample RE33-99-0012 from PRS C-33-003 at levels below the CRDL; therefore, the result is qualified as estimated, indicating that the value is more uncertain than other data because the concentration is so low. Focused validation of the data showed naphthalene to be present in both blank samples analyzed with this group of samples, although naphthalene was not reported as detected because of its low concentration. This indicates that naphthalene is likely present in the sample due to laboratory contamination and not due to LANL activities. Therefore, naphthalene is considered undetected in sample RE33-99-0012.

Toluene was reported as detected in several samples associated with requests 5555R and 5651R. In request 5555R, four samples collected from each of the PRSs were reported to contain detectable amounts of toluene at levels well below the CDRL. These values were J-qualified because they were such low concentrations. Although toluene was not reported to be present in the laboratory blanks associated with this request, there is a small peak present in the blank chromatograph that could be due to toluene. The peak is too small to be quantified but it is similar in scale to the peak attributed as detected in the sample. As a result of this potential contamination of the blank and sample, and due to the very low concentrations of toluene in question, toluene in the samples associated with request 5555R should be considered undetected. In request 5651R, toluene was detected in several samples. However, the analytical laboratory noted that the sample containers were not properly sealed. This can lead to loss of target compounds and/or contamination from the surrounding air. There is no way to determine how significant the losses or contamination may be. Therefore, all the VOC data associated with request 5651R is rejected due to improperly sealed sample containers.

Trichloroethene was reported as detected in several samples in requests 5570R and 5651R. In request 5570R, the trichloroethene results were qualified as estimated because trichloroethene was present at levels below the CRDL, indicating that the value is more uncertain than other data because the concentration is so low. Trichloroethene will be carried into screening assessments. In request 5651R trichloroethene was detected in several samples. However, the analytical laboratory noted that the sample containers were not properly sealed. This can lead to loss of target compounds and/or contamination from the surrounding air. There is no way to determine how significant the losses or contamination may be. Therefore, all the VOC data associated with request 5651R is rejected due to improperly sealed sample containers.

PCBs

Two different PCBs were detected in two samples from PRS C-33-003. All results were so close to the detection limit that the data was qualified as estimated. Sample RE33-99-0023 had low levels of Aroclor-1254, sample RE33-99-0026 had low levels of Aroclor-1260. The laboratory failed to run a second column to confirm the identification of these PCBs which makes it more likely that these detected PCBs are actually false positives. It is unlikely that the detected PCBs came from a spill because they are two different PCBs, although both are very commonly used.

4.0 SITE RESTORATION

Site restoration activities were completed at each of the PRSs to mitigate the potential for erosion into the adjacent surface water drainages. These activities were overseen by ESH-18 to ensure that LANL BMP installation guidance was followed. Site restoration activities for the PRSs are summarized below.

After processed soil was returned to PRSs 33-007(b) and 33-010(c), the soil was re-graded, contoured, and compacted (with a front-end loader) to minimize the potential for channelization. The large tuff boulders (that were separated) were placed along the base of the disturbed areas to mitigate the potential for soil transport into the drainage and to provide for slope stabilization. Re-vegetation consisted of broadcast seeding of both the flat and sloped areas using a seed mix recommended by ESH-20. The seed was raked and secured within the upper two inches of the soil. The seeded area was then covered with wood-chip mulch to minimize the potential for wind blowing the seed away and to maximize the potential for germination to occur. Composite turf reinforcement matting (utilizing natural and synthetic components) was also installed on the exposed and disturbed slopes at the sites to provide immediate erosion control and promote the establishment of vegetation.

After process soil was returned to PRS C-33-003, the soil was regraded. An earthen berm was also constructed at the western boundary to mitigate the potential for the transport of soil into the adjacent drainage. Re-seeding will take place at a later date, following decontamination and decommissioning of the water tower located nearby.

After the vegetation grows to a density of greater than 70%, the inspection and maintenance of the BMPs on-site will be transferred back to the Facility Manager.

5.0 WASTE MANAGEMENT

Table 5.0-1 summarizes the waste types, expected volumes, and actual volumes generated during VCA activities.

Table 5.0-1
Estimated and Actual Waste Descriptions and Volumes

Item	Waste Type	Anticipated Volume	Actual Volume
IDW/PPE[a]	Low-level radioactive	< 55 gal.	None
IDW/PPE	Municipal refuse	None	0.5 yd^3
Contaminated soils	Low-level radioactive	40 yd^3	373 yd^3
Contaminated debris	Low-level radioactive	1 yd^3	—
Debris	Industrial	10 yd^3	—
Decontamination liquid	Low-level radioactive	1000 gal.	None

[a] IDW = investigation-derived waste; PPE = personal protective equipment.

All waste was stored in enclosed containers that were appropriate and approved for the particular waste types and was and managed in accordance with all EPA, NMED, DOE, and LANL requirements. The low-level radioactive wastes were stored on-site in a radiological waste holding area.

All investigation-derived waste (IDW) consisting of personal protective equipment and sampling equipment that contacted potentially-contaminated material was decontaminated and then screened for radioactivity in accordance with LANL-ER-SOP 10.07, Field Monitoring for Surface and Volume Radioactivity Levels. All IDW was successfully decontaminated and, as a result, characterized and disposed as non-radioactive waste.

Contaminated soil waste was characterized using representative direct sampling. Based on the elevated radioactivity, the contaminated soil waste was characterized and disposed as low-level radioactive waste.

Debris screened for radioactivity using hand-held instruments in accordance with LANL-ER-SOP 10.07, Field Monitoring for Surface and Volume Radioactivity Levels. Any debris with activity above background activities was managed, stored, and disposed as low-level radioactive waste. Debris with activity below background was recycled or managed as industrial solid waste.

Minimal liquid was used for decontamination because a dry decontamination procedure was used to remove the potentially-contaminated soil wastes. Although small amounts of decontamination liquids were generated, they were added to the dry soil waste as a dust suppressant in a manner such that free liquids were not generated.

6.0 CONCLUSION AND RECOMMENDATIONS

A VCA was conducted at PRSs 33-007(b), 33-010(c), and C-33-003 to separate and remove radioactively contaminated materials exceeding dose-based levels and to mitigate the migration of contaminants and debris in the associated drainages.

VCA activities included excavating soil and debris from each PRS and transporting the material to a centralized location where the material was processed using the SGS technology. The SGS separated the soil into a radioactive waste material (soil with activities above the SGS target criterion) and a returnable stream (soil with activities below the SGS target criterion), which could be returned to the PRS. Confirmatory sampling was conducted to evaluate vertical and lateral extent of contamination following the remediation.

A total of 2526 cy of material was processed by the SGS plant between April 28 and May 19, 1999. Table 4.0-1 details the total volume of material processed, diverted, and reduced for each PRS. Volume reduction by the SGS was reported as follows: 99.65% for C-33-003, 99.79% for 33-010(c), and 75.47% for 33-007(b). A target-criteria of 50 pCi/g was used for PRSs 33-007(b) and C-33-003; a target criteria of 65 pCi/g was used for PRS 33-010(c). A target criteria of 50 pCi/g was originally used for the material from PRS 33-010(c), but the level was reset to 65 pCi/g, and 253 cy of material from this PRS was reprocessed.

Table 6.0-1
Volumes Processed, Diverted, and Reduced

PRS Number	Total Volume Processed (yd^3)	Total Volume of Contaminated Material Diverted (yd^3)	Volume Reduction (%)
C-33-003	408.50	1.45	99.65
33-010(c)	289.39	0.58	99.79
33-007(b)	1677.87	411.63	75.47

Further work associated with these PRS will be addressed as part of the Chaquehui Canyon Aggregate under the watershed aggregate approach. Data collected during VCA activities will be used in future comprehensive assessments regarding these PRSs.

7.0 REFERENCES

ICF Kaiser, January 1997. "Geophysical Investigation at PRS C-33-003 (TA-33) Los Alamos National Laboratory," Los Alamos, New Mexico. (ICF Kaiser 1997, 62892)

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Ryti, R.T., P.A. Longmire, D.E. Broxton, S.L. Reneau, and E.V. McDonald, September 1998. "Inorganic and Radionuclide Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Los Alamos National Laboratory Report LA-UR-98-4847, Los Alamos, New Mexico. (Ryti et al. 1998, 59730)

Appendix A

Natural Uranium Isotopic Ratios

J. R. MANN, INC. **MEMO**

JOHN MANN, CERTIFIED HEALTH PHYSICIST

jrmanninc@worldnet.att.net

Date: 28 July 1999

To: Mary Lee Hogg

Subject: Natural Uranium Isotopic Ratios

Naturally occurring uranium consists of three isotopes: ^{234}U, ^{235}U, and ^{238}U. The relative amounts (and the activities) of the three isotopes in natural uranium vary with the location of the uranium ore and processing methods. However, the commonly accepted, published values[1] for the isotopic abundances of the three isotopes in terms of mass and activity percentages are:

ISOTOPE	MASS %	ACTIVITY %
^{238}U	99.27	47.2
^{235}U	0.7204	2.2
^{234}U	0.0057	50.5

Individual uranium isotopic analysis values of natural uranium soil samples may be used to calculate the total activity of a natural uranium sample by multiplying each of the three isotope activities by its activity percent listed above. For example:

Lab analysis results on sample #RE33-99-0054 gave the following values for the three uranium isotopes: ^{234}U = 17.0 pCi/g, ^{235}U = 0.864 pCi/g, and ^{238}U = 19.5 pCi/g.

Multiplying each activity value by its natural uranium activity percent gives:

^{234}U: 17.0 x 0.505 = 8.58 pCi/g

^{235}U: 0.864 x 0.022 = 0.019 pCi/g

^{238}U: 19.5 x 0.472 = 9.20 pCi/g

Summing the three gives 17.8 pCi/g as the total natural uranium activity of the sample.

If you need more information please call me.

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[1] DOE *Health Physics Manual of Good Practices for Uranium Facilities,* INEL DE88-013620; EGG-2530; UC-41; 1988.

^{234}U: 17.0 x 0.505 = 8.58 pCi/g

^{235}U: 0.864 x 0.022 = 0.019 pCi/g

^{238}U: 19.5 x 0.472 = 9.20 pCi/g

Summing the three gives 17.8 pCi/g as the total natural uranium activity of the sample.

If you need more information please call me.

Appendix B

RESRAD Calculations

J. R. Mann, Inc. Memo

JOHN MANN, CERTIFIED HEALTH PHYSICIST
jrmanninc@worldnet.att.net

Date: 11 March 99

To: Lynn Kidman

Cc: Rich Baker
Kristi Beguin
Linda Fluk

Subject: PRS 33-003, -007(b), -010(c) RESRAD Results for U-NAT & DU; Trail Hiker & Commercial Scenarios

The RESRAD results for the three sites are tabulated below. The RESRAD result is presented in mrem/yr/pCi/g of soil. You will recall that the PRG in pCi/g is determined by dividing the desired radiation dose limit (mrem/yr) by the RESRAD result (mrem/yr/pCi/g).

SITE			RESRAD Result, mrem/yr/pCi/g			
			Commercial Scenario		Trail User Scenario	
ID No.	Area(m^2)	Depth(m)	Natural U	Depleted U	Natural U	Depleted
33-003	1210	1.3	0.0246	0.0272	0.0277	0.0277
33-007	256	3.3	0.0237	0.0241	0.0236	0.0237
33-010	167	1.3	0.0207	0.0286	0.0224	0.0227

There is very little difference in the results among the 12 RESRAD runs made: the highest dose is 0. 0286 mrem/yr/pCi/g; the lowest is 0.0207 mrem/yr/pCi/g. I will retain the hard copy output of the RESRAD runs.

Trailuser

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RT
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RT
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RT
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
)-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
)-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
)-5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
)-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
)-5				
5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
)-5				
)-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
5				
)-5	U-234 , fish	1.000E+01	1.000E+01	BIO
5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.210E+03	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	5.070E-01	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	2.300E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	4.700E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R015	Number of unsaturated zone strata	not used	1	-
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	-
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	-
R015	Unsat. zone 1, total porosity	not used	4.000E-01	-
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	-
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	-
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	not used	0.000E+00	-
R015	Unsat. zone 2, soil density (g/cm**3)	not used	1.500E+00	-
R015	Unsat. zone 2, total porosity	not used	4.000E-01	-
R015	Unsat. zone 2, effective porosity	not used	2.000E-01	-
R015	Unsat. zone 2, soil-specific b parameter	not used	5.300E+00	-
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	not used	1.000E+01	-
R016	Distribution coefficients for U-234			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ac-227			
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.10
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	-
R017	Mass loading for inhalation (g/m**3)	2.000E-03	1.000E-04	-
R017	Exposure duration	9.000E+00	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	-
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	-
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	-
R017	Fraction of time spent outdoors (on site)	3.900E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used b (If different
17	Radii of shape factor array (used if FS = -1):			
017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
17	Outer annular radius (m), ring 2:	not used	7.071E+01	-
17	Outer annular radius (m), ring 3:	not used	0.000E+00	-
017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
17	Outer annular radius (m), ring 6:	not used	0.000E+00	-
017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
17	Outer annular radius (m), ring 9:	not used	0.000E+00	-
17	Outer annular radius (m), ring 10:	not used	0.000E+00	-
017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
17	Outer annular radius (m), ring 12:	not used	0.000E+00	-
017	Fractions of annular areas within AREA:			
017	Ring 1	not used	1.000E+00	-
17	Ring 2	not used	2.732E-01	-
017	Ring 3	not used	0.000E+00	-
017	Ring 4	not used	0.000E+00	-
17	Ring 5	not used	0.000E+00	-
17	Ring 6	not used	0.000E+00	-
017	Ring 7	not used	0.000E+00	-
17	Ring 8	not used	0.000E+00	-
17	Ring 9	not used	0.000E+00	-
017	Ring 10	not used	0.000E+00	-
017	Ring 11	not used	0.000E+00	-
17	Ring 12	not used	0.000E+00	-
018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
18	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
18	Milk consumption (L/yr)	not used	9.200E+01	-
018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
018	Fish consumption (kg/yr)	not used	5.400E+00	-
18	Other seafood consumption (kg/yr)	not used	9.000E-01	-
018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
018	Drinking water intake (L/yr)	not used	5.100E+02	-
18	Contamination fraction of drinking water	not used	1.000E+00	-
18	Contamination fraction of household water	0.000E+00	1.000E+00	-
018	Contamination fraction of livestock water	not used	1.000E+00	-
018	Contamination fraction of irrigation water	not used	1.000E+00	-
018	Contamination fraction of aquatic food	not used	5.000E-01	-
018	Contamination fraction of plant food	not used	-1	-
018	Contamination fraction of meat	not used	-1	-
018	Contamination fraction of milk	not used	-1	-
019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
019	Livestock soil intake (kg/day)	not used	5.000E-01	-
019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	not used	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	not used	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	not used	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	not used	3.000E-02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
021	Diffusion coefficient for radon gas (m/sec):			
021	in cover material	not used	2.000E-06	-
021	in foundation material	not used	3.000E-07	-
021	in contaminated zone soil	2.000E-06	2.000E-06	-
021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
021	Average building air exchange rate (1/hr)	0.000E+00	5.000E-01	-
021	Height of the building (room) (m)	not used	2.500E+00	-
021	Building interior area factor	not used	0.000E+00	code computed
021	Building depth below ground surface (m)	not used	-1.000E+00	-
021	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
021	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1210.00 square meters	U-234	5.070E-01
Thickness:	1.30 meters	U-235	2.300E-02
Cover Depth:	0.00 meters	U-238	4.700E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 15 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	1.00
TDOSE(t):	2.638E-02	2.638E-02	2.638E-02	2.638E-02	2.640E-02	2.646E-02	2.669E-02	2.77
M(t):	1.759E-03	1.759E-03	1.759E-03	1.759E-03	1.760E-03	1.764E-03	1.779E-03	1.84

Maximum TDOSE(t): 2.774E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	7.400E-06	0.0003	1.234E-02	0.4679	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	6.227E-04	0.0236	5.218E-04	0.0198	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.262E-03	0.0858	1.023E-02	0.3878	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.892E-03	0.1096	2.309E-02	0.8755	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	7.401E-06	0.0003	1.234E-02	0.4679	2.595E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	6.227E-04	0.0236	5.219E-04	0.0198	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.262E-03	0.0858	1.023E-02	0.3878	2.597E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.892E-03	0.1096	2.309E-02	0.8755	2.595E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	7.404E-06	0.0003	1.234E-02	0.4679	2.333E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	6.227E-04	0.0236	5.222E-04	0.0198	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	2.262E-03	0.0858	1.023E-02	0.3877	6.152E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.892E-03	0.1096	2.309E-02	0.8755	2.333E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	7.441E-06	0.0003	1.235E-02	0.4679	2.585E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	6.228E-04	0.0236	5.238E-04	0.0199	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.262E-03	0.0857	1.023E-02	0.3877	2.265E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.892E-03	0.1096	2.310E-02	0.8755	2.585E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	7.753E-06	0.0003	1.235E-02	0.4678	2.305E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
J-235	6.232E-04	0.0236	5.316E-04	0.0201	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	2.262E-03	0.0857	1.023E-02	0.3875	6.066E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.893E-03	0.1096	2.311E-02	0.8755	2.306E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.125E-05	0.0004	1.236E-02	0.4672	2.478E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	6.253E-04	0.0236	5.752E-04	0.0217	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.262E-03	0.0855	1.023E-02	0.3866	2.179E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.898E-03	0.1095	2.317E-02	0.8756	2.478E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	4.091E-05	0.0015	1.241E-02	0.4649	1.985E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	6.326E-04	0.0237	7.172E-04	0.0269	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	2.261E-03	0.0847	1.023E-02	0.3834	5.273E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.934E-03	0.1099	2.336E-02	0.8751	1.985E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.466E-04	0.0125	1.256E-02	0.4527	7.716E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	6.707E-04	0.0242	1.211E-03	0.0437	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.291E-03	0.0826	1.024E-02	0.3691	7.002E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	3.308E-03	0.1193	2.401E-02	0.8655	7.723E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*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	3.000E+01	1.000E+02	3.000E+
J-234	U-234	1.000E+00	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.475E-02	2.473E-
234	Th-230	1.000E+00	0.000E+00	5.487E-07	1.646E-06	5.486E-06	1.646E-05	5.483E-05	1.643E-
234	Ra-226	1.000E+00	0.000E+00	7.730E-10	6.955E-09	7.720E-08	6.927E-07	7.617E-06	6.656E-
J-234	Pb-210	1.000E+00	0.000E+00	2.976E-13	7.912E-12	2.777E-10	6.493E-09	1.585E-07	2.023E-
J-234	∑DSR(j)		2.476E-02	2.476E-02	2.476E-02	2.477E-02	2.478E-02	2.481E-02	2.496E-
J-235	U-235	1.000E+00	5.014E-02	5.014E-02	5.014E-02	5.014E-02	5.014E-02	5.013E-02	5.011E-
J-235	Pa-231	1.000E+00	0.000E+00	5.458E-06	1.637E-05	5.457E-05	1.637E-04	5.451E-04	1.631E-
235	Ac-227	1.000E+00	0.000E+00	4.437E-07	3.910E-06	4.044E-05	3.006E-04	1.967E-03	7.539E-
235	∑DSR(j)		5.014E-02	5.015E-02	5.016E-02	5.023E-02	5.060E-02	5.264E-02	5.928E-
238	U-238	1.000E+00	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.695E-02	2.694E-
238	U-234	1.000E+00	0.000E+00	7.020E-08	2.106E-07	7.020E-07	2.106E-06	7.018E-06	2.104E-
J-238	Th-230	1.000E+00	0.000E+00	7.777E-13	6.999E-12	7.777E-11	6.998E-10	7.773E-09	6.988E-
J-238	Ra-226	1.000E+00	0.000E+00	8.347E-16	1.978E-14	7.299E-13	1.966E-11	7.224E-10	1.908E-
238	Pb-210	1.000E+00	0.000E+00	0.000E+00	1.253E-17	1.995E-15	1.441E-13	1.260E-11	5.299E-
J-238	∑DSR(j)		2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-

Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
e 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 = 15 mrem/yr

nclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
-234	6.058E+02	6.057E+02	6.057E+02	6.056E+02	6.054E+02	6.045E+02	6.010E+02
-235	2.992E+02	2.991E+02	2.990E+02	2.986E+02	2.964E+02	2.849E+02	2.530E+02
J-238	5.564E+02	5.564E+02	5.564E+02	5.564E+02	5.564E+02	5.564E+02	5.563E+02

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 = 1.000E+03 years

nclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
-234	5.070E-01	1.000E+03	2.588E-02	5.796E+02	2.588E-02	5.796E+02
J-235	2.300E-02	1.000E+03	8.293E-02	1.809E+02	8.293E-02	1.809E+02
J-238	4.700E-01	1.000E+03	2.704E-02	5.547E+02	2.704E-02	5.547E+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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	1.255E-02	1.255E-02	1.255E-02	1.255E-02	1.255E-02	1.255E-02	1.254E-
U-234	U-238	1.000E+00	0.000E+00	3.299E-08	9.898E-08	3.299E-07	9.897E-07	3.298E-06	9.888E-
U-234	∑DOSE(j):		1.255E-02	1.255E-02	1.255E-02	1.255E-02	1.255E-02	1.255E-02	1.255E-
Th-230	U-234	1.000E+00	0.000E+00	2.782E-07	8.345E-07	2.781E-06	8.343E-06	2.780E-05	8.328E-
Th-230	U-238	1.000E+00	0.000E+00	3.655E-13	3.290E-12	3.655E-11	3.289E-10	3.653E-09	3.284E-
Th-230	∑DOSE(j):		0.000E+00	2.782E-07	8.345E-07	2.782E-06	8.344E-06	2.780E-05	8.331E-
Ra-226	U-234	1.000E+00	0.000E+00	3.919E-10	3.526E-09	3.914E-08	3.512E-07	3.862E-06	3.374E-
Ra-226	U-238	1.000E+00	0.000E+00	3.923E-16	9.298E-15	3.430E-13	9.240E-12	3.395E-10	8.966E-
Ra-226	∑DOSE(j):		0.000E+00	3.919E-10	3.526E-09	3.914E-08	3.512E-07	3.862E-06	3.375E-
Pb-210	U-234	1.000E+00	0.000E+00	1.509E-13	4.011E-12	1.408E-10	3.292E-09	8.036E-08	1.026E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	5.890E-18	9.378E-16	6.772E-14	5.922E-12	2.491E-
Pb-210	∑DOSE(j):		0.000E+00	1.509E-13	4.011E-12	1.408E-10	3.292E-09	8.037E-08	1.026E-
U-235	U-235	1.000E+00	1.153E-03	1.153E-03	1.153E-03	1.153E-03	1.153E-03	1.153E-03	1.152E-
Pa-231	U-235	1.000E+00	0.000E+00	1.255E-07	3.766E-07	1.255E-06	3.765E-06	1.254E-05	3.752E-
Ac-227	U-235	1.000E+00	0.000E+00	1.021E-08	8.994E-08	9.300E-07	6.915E-06	4.523E-05	1.734E-
U-238	U-238	1.000E+00	1.267E-02	1.267E-02	1.267E-02	1.267E-02	1.267E-02	1.267E-02	1.266E-

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

uclide (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+
-234	U-234	1.000E+00	5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.069E-01	5.067E-01	5.062E-
234	U-238	1.000E+00	0.000E+00	1.332E-06	3.997E-06	1.332E-05	3.997E-05	1.332E-04	3.993E-
234	∑S(j):		5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.069E-01	5.066E-
--230	U-234	1.000E+00	0.000E+00	4.564E-06	1.369E-05	4.564E-05	1.369E-04	4.561E-04	1.366E-
--230	U-238	1.000E+00	0.000E+00	5.997E-12	5.397E-11	5.997E-10	5.397E-09	5.994E-08	5.389E-
h-230	∑S(j):		0.000E+00	4.564E-06	1.369E-05	4.564E-05	1.369E-04	4.561E-04	1.367E-
--226	U-234	1.000E+00	0.000E+00	9.884E-10	8.893E-09	9.871E-08	8.858E-07	9.740E-06	8.511E-
--226	U-238	1.000E+00	0.000E+00	9.895E-16	2.345E-14	8.652E-13	2.330E-11	8.563E-10	2.261E-
a-226	∑S(j):		0.000E+00	9.884E-10	8.893E-09	9.871E-08	8.858E-07	9.740E-06	8.513E-
-210	U-234	1.000E+00	0.000E+00	1.016E-11	2.701E-10	9.483E-09	2.217E-07	5.412E-06	6.907E-
b-210	U-238	1.000E+00	0.000E+00	0.000E+00	3.967E-16	6.316E-14	4.561E-12	3.988E-10	1.677E-
b-210	∑S(j):		0.000E+00	1.016E-11	2.701E-10	9.483E-09	2.217E-07	5.412E-06	6.908E-
-235	U-235	1.000E+00	2.300E-02	2.300E-02	2.300E-02	2.300E-02	2.300E-02	2.299E-02	2.298E-
-231	U-235	1.000E+00	0.000E+00	4.866E-07	1.460E-06	4.866E-06	1.459E-05	4.860E-05	1.454E-
Ac-227	U-235	1.000E+00	0.000E+00	7.665E-09	6.755E-08	6.985E-07	5.193E-06	3.397E-05	1.302E-
238	U-238	1.000E+00	4.700E-01	4.700E-01	4.700E-01	4.700E-01	4.700E-01	4.699E-01	4.697E-

RF(i) is the branch fraction of the parent nuclide.

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RT
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RT
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RT
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
-5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
-5				
-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
-5				
-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
5				
-5	U-234 , fish	1.000E+01	1.000E+01	BIO
-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.210E+03	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	8.500E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	1.400E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	9.010E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
15	Number of unsaturated zone strata	2	1	-
R015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
R015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
R016	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
16	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
16	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Ac-227			
016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.10
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	
R017	Mass loading for inhalation (g/m**3)	2.000E-03	1.000E-04	
R017	Exposure duration	9.000E+00	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	
R017	Fraction of time spent outdoors (on site)	3.900E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used b (If different
017	Radii of shape factor array (used if FS = -1):			
017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
17	Outer annular radius (m), ring 2:	not used	7.071E+01	-
17	Outer annular radius (m), ring 3:	not used	0.000E+00	-
017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
17	Outer annular radius (m), ring 6:	not used	0.000E+00	-
017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
17	Outer annular radius (m), ring 9:	not used	0.000E+00	-
017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
17	Outer annular radius (m), ring 12:	not used	0.000E+00	-
017	Fractions of annular areas within AREA:			
017	Ring 1	not used	1.000E+00	-
17	Ring 2	not used	2.732E-01	-
017	Ring 3	not used	0.000E+00	-
017	Ring 4	not used	0.000E+00	-
17	Ring 5	not used	0.000E+00	-
17	Ring 6	not used	0.000E+00	-
017	Ring 7	not used	0.000E+00	-
17	Ring 8	not used	0.000E+00	-
17	Ring 9	not used	0.000E+00	-
017	Ring 10	not used	0.000E+00	-
017	Ring 11	not used	0.000E+00	-
17	Ring 12	not used	0.000E+00	-
018	Fruits, vegetables and grain consumption (kg/yr)	0.000E+00	1.600E+02	-
18	Leafy vegetable consumption (kg/yr)	0.000E+00	1.400E+01	-
18	Milk consumption (L/yr)	0.000E+00	9.200E+01	-
018	Meat and poultry consumption (kg/yr)	0.000E+00	6.300E+01	-
018	Fish consumption (kg/yr)	0.000E+00	5.400E+00	-
18	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	-
018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
018	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
18	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
018	Contamination fraction of household water	0.000E+00	1.000E+00	-
018	Contamination fraction of livestock water	0.000E+00	1.000E+00	-
018	Contamination fraction of irrigation water	0.000E+00	1.000E+00	-
018	Contamination fraction of aquatic food	0.000E+00	5.000E-01	-
018	Contamination fraction of plant food	0.000E+00	-1	-
018	Contamination fraction of meat	0.000E+00	-1	-
018	Contamination fraction of milk	0.000E+00	-1	-
019	Livestock fodder intake for meat (kg/day)	0.000E+00	6.800E+01	-
019	Livestock fodder intake for milk (kg/day)	0.000E+00	5.500E+01	-
019	Livestock water intake for meat (L/day)	0.000E+00	5.000E+01	-
019	Livestock water intake for milk (L/day)	0.000E+00	1.600E+02	-
019	Livestock soil intake (kg/day)	0.000E+00	5.000E-01	-
019	Mass loading for foliar deposition (g/m**3)	0.000E+00	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	0.000E+00	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	-
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	-
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	-
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	-
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	not used	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	not used	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	not used	3.000E-02	-

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used b (If different
21	Diffusion coefficient for radon gas (m/sec):			
021	in cover material	not used	2.000E-06	-
21	in foundation material	not used	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
021	Average building air exchange rate (1/hr)	0.000E+00	5.000E-01	-
21	Height of the building (room) (m)	not used	2.500E+00	-
021	Building interior area factor	not used	0.000E+00	code computed
021	Building depth below ground surface (m)	not used	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
21	Emanating power of Rn-220 gas	not used	1.500E-01	-

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	active
Find peak pathway doses	suppressed

Contaminated Zone Dimensions	
Area:	1210.00 square meters
Thickness:	1.30 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
U-234	8.500E-02
U-235	1.400E-02
U-238	9.010E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 15 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	1.00
TDOSE(t):	2.710E-02	2.710E-02	2.710E-02	2.710E-02	2.710E-02	2.714E-02	2.724E-02	2.77
M(t):	1.806E-03	1.806E-03	1.806E-03	1.807E-03	1.807E-03	1.809E-03	1.816E-03	1.84

Maximum TDOSE(t): 2.773E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	1.241E-06	0.0000	2.069E-03	0.0764	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
J-235	3.791E-04	0.0140	3.176E-04	0.0117	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.337E-03	0.1600	1.961E-02	0.7236	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.717E-03	0.1741	2.200E-02	0.8117	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.241E-06	0.0000	2.069E-03	0.0764	4.350E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.791E-04	0.0140	3.177E-04	0.0117	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.337E-03	0.1600	1.961E-02	0.7236	4.979E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.717E-03	0.1741	2.200E-02	0.8117	4.350E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	1.241E-06	0.0000	2.069E-03	0.0764	3.912E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.791E-04	0.0140	3.179E-04	0.0117	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.337E-03	0.1600	1.961E-02	0.7236	1.179E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.717E-03	0.1741	2.200E-02	0.8117	3.912E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.247E-06	0.0000	2.070E-03	0.0764	4.333E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.791E-04	0.0140	3.188E-04	0.0118	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.337E-03	0.1600	1.961E-02	0.7236	4.342E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.717E-03	0.1741	2.200E-02	0.8117	4.333E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	1.300E-06	0.0000	2.070E-03	0.0764	3.865E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.793E-04	0.0140	3.236E-04	0.0119	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.336E-03	0.1600	1.961E-02	0.7235	1.163E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
otal	4.717E-03	0.1740	2.200E-02	0.8118	3.866E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
-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
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
otal	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.885E-06	0.0001	2.073E-03	0.0764	4.154E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.806E-04	0.0140	3.501E-04	0.0129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.336E-03	0.1598	1.961E-02	0.7226	4.177E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.718E-03	0.1739	2.203E-02	0.8119	4.159E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	6.859E-06	0.0003	2.080E-03	0.0763	3.327E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	3.850E-04	0.0141	4.365E-04	0.0160	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.334E-03	0.1591	1.961E-02	0.7199	1.011E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
otal	4.726E-03	0.1735	2.213E-02	0.8123	3.338E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.811E-05	0.0021	2.105E-03	0.0759	1.294E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	4.083E-04	0.0147	7.371E-04	0.0266	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.392E-03	0.1584	1.963E-02	0.7079	1.342E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.858E-03	0.1752	2.247E-02	0.8105	1.307E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

arent (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+
-234	U-234	1.000E+00	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.475E-02	2.473E-
234	Th-230	1.000E+00	0.000E+00	5.487E-07	1.646E-06	5.486E-06	1.646E-05	5.483E-05	1.643E-
234	Ra-226	1.000E+00	0.000E+00	7.730E-10	6.955E-09	7.720E-08	6.927E-07	7.617E-06	6.656E-
-234	Pb-210	1.000E+00	0.000E+00	2.976E-13	7.912E-12	2.777E-10	6.493E-09	1.585E-07	2.023E-
234	∑DSR(j)		2.476E-02	2.476E-02	2.476E-02	2.477E-02	2.478E-02	2.481E-02	2.496E-
-235	U-235	1.000E+00	5.014E-02	5.014E-02	5.014E-02	5.014E-02	5.014E-02	5.013E-02	5.011E-
-235	Pa-231	1.000E+00	0.000E+00	5.458E-06	1.637E-05	5.457E-05	1.637E-04	5.451E-04	1.631E-
235	Ac-227	1.000E+00	0.000E+00	4.437E-07	3.910E-06	4.044E-05	3.006E-04	1.967E-03	7.539E-
235	∑DSR(j)		5.014E-02	5.015E-02	5.016E-02	5.023E-02	5.060E-02	5.264E-02	5.928E-
238	U-238	1.000E+00	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.695E-02	2.694E-
238	U-234	1.000E+00	0.000E+00	7.020E-08	2.106E-07	7.020E-07	2.106E-06	7.018E-06	2.104E-
-238	Th-230	1.000E+00	0.000E+00	7.777E-13	6.999E-12	7.777E-11	6.998E-10	7.773E-09	6.988E-
238	Ra-226	1.000E+00	0.000E+00	8.347E-16	1.978E-14	7.299E-13	1.966E-11	7.224E-10	1.908E-
238	Pb-210	1.000E+00	0.000E+00	0.000E+00	1.253E-17	1.995E-15	1.441E-13	1.260E-11	5.299E-
-238	∑DSR(j)		2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-02	2.696E-

ranch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
e 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 = 15 mrem/yr

clide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
234	6.058E+02	6.057E+02	6.057E+02	6.056E+02	6.054E+02	6.045E+02	6.010E+02
235	2.992E+02	2.991E+02	2.990E+02	2.986E+02	2.964E+02	2.849E+02	2.530E+02
-238	5.564E+02	5.564E+02	5.564E+02	5.564E+02	5.564E+02	5.564E+02	5.563E+02

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 = 1.000E+03 years

uclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
-234	8.500E-02	1.000E+03	2.588E-02	5.796E+02	2.588E-02	5.796E+02
-235	1.400E-02	1.000E+03	8.293E-02	1.809E+02	8.293E-02	1.809E+02
-238	9.010E-01	1.000E+03	2.704E-02	5.547E+02	2.704E-02	5.547E+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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	2.105E-03	2.105E-03	2.105E-03	2.105E-03	2.105E-03	2.104E-03	2.102E-
U-234	U-238	1.000E+00	0.000E+00	6.325E-08	1.898E-07	6.325E-07	1.897E-06	6.323E-06	1.895E-
U-234	∑DOSE(j):		2.105E-03	2.105E-03	2.105E-03	2.105E-03	2.106E-03	2.110E-03	2.121E-
Th-230	U-234	1.000E+00	0.000E+00	4.664E-08	1.399E-07	4.663E-07	1.399E-06	4.660E-06	1.396E-
Th-230	U-238	1.000E+00	0.000E+00	7.007E-13	6.306E-12	7.007E-11	6.305E-10	7.003E-09	6.296E-
Th-230	∑DOSE(j):		0.000E+00	4.664E-08	1.399E-07	4.664E-07	1.399E-06	4.667E-06	1.402E-
Ra-226	U-234	1.000E+00	0.000E+00	6.571E-11	5.912E-10	6.562E-09	5.888E-08	6.474E-07	5.657E-
Ra-226	U-238	1.000E+00	0.000E+00	7.521E-16	1.782E-14	6.576E-13	1.771E-11	6.509E-10	1.719E-
Ra-226	∑DOSE(j):		0.000E+00	6.571E-11	5.912E-10	6.562E-09	5.890E-08	6.481E-07	5.675E-
Pb-210	U-234	1.000E+00	0.000E+00	2.530E-14	6.725E-13	2.361E-11	5.519E-10	1.347E-08	1.719E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	1.129E-17	1.798E-15	1.298E-13	1.135E-11	4.775E-
Pb-210	∑DOSE(j):		0.000E+00	2.530E-14	6.725E-13	2.361E-11	5.520E-10	1.348E-08	1.724E-
U-235	U-235	1.000E+00	7.020E-04	7.020E-04	7.020E-04	7.020E-04	7.019E-04	7.018E-04	7.015E-
Pa-231	U-235	1.000E+00	0.000E+00	7.641E-08	2.292E-07	7.640E-07	2.292E-06	7.632E-06	2.284E-
Ac-227	U-235	1.000E+00	0.000E+00	6.212E-09	5.474E-08	5.661E-07	4.209E-06	2.753E-05	1.055E-
U-238	U-238	1.000E+00	2.429E-02	2.429E-02	2.429E-02	2.429E-02	2.429E-02	2.428E-02	2.427E-

BRF(i) is the branch fraction of the parent nuclide.

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+
J-234	U-234	1.000E+00	8.500E-02	8.500E-02	8.500E-02	8.500E-02	8.499E-02	8.496E-02	8.487E-
234	U-238	1.000E+00	0.000E+00	2.554E-06	7.663E-06	2.554E-05	7.662E-05	2.553E-04	7.655E-
234	∑S(j):		8.500E-02	8.500E-02	8.501E-02	8.502E-02	8.506E-02	8.521E-02	8.564E-
Th-230	U-234	1.000E+00	0.000E+00	7.652E-07	2.295E-06	7.651E-06	2.295E-05	7.646E-05	2.291E-
-230	U-238	1.000E+00	0.000E+00	1.150E-11	1.035E-10	1.150E-09	1.035E-08	1.149E-07	1.033E-
Th-230	∑S(j):		0.000E+00	7.652E-07	2.296E-06	7.652E-06	2.296E-05	7.658E-05	2.301E-
-226	U-234	1.000E+00	0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.633E-06	1.427E-
-226	U-238	1.000E+00	0.000E+00	1.897E-15	4.495E-14	1.659E-12	4.467E-11	1.642E-09	4.335E-
Ra-226	∑S(j):		0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.635E-06	1.431E-
-210	U-234	1.000E+00	0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.073E-07	1.158E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	7.604E-16	1.211E-13	8.743E-12	7.645E-10	3.215E-
Pb-210	∑S(j):		0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.081E-07	1.161E-
U-235	U-235	1.000E+00	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.399E-
-231	U-235	1.000E+00	0.000E+00	2.962E-07	8.886E-07	2.962E-06	8.883E-06	2.958E-05	8.852E-
Ac-227	U-235	1.000E+00	0.000E+00	4.665E-09	4.111E-08	4.252E-07	3.161E-06	2.068E-05	7.927E-
238	U-238	1.000E+00	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.009E-01	9.008E-01	9.004E-

BRF(i) is the branch fraction of the parent nuclide.

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RT
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RT
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RT
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RT
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RT
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RT
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RT
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RT
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RT
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RT
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RT
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RT
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RT
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RT
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RT
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RT
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
)-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
-5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
)-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
)-5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
)-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
)-5				
-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
)-5				
)-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
5				
)-5	U-234 , fish	1.000E+01	1.000E+01	BIO
5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	2.560E+02	1.000E+04	-
R011	Thickness of contaminated zone (m)	3.200E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	8.500E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	1.400E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	9.010E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used b (If different
15	Number of unsaturated zone strata	2	1	-
015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
016	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
16	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for U-238			
016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
16	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for daughter Ac-227			
16	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
16	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	2.24
016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.49
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.42
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.5
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	-
R017	Mass loading for inhalation (g/m**3)	2.000E-03	1.000E-04	-
R017	Exposure duration	9.000E+00	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	-
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	-
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	-
R017	Fraction of time spent outdoors (on site)	3.900E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	-
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
R017	Ring 1	not used	1.000E+00	-
R017	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
R017	Ring 5	not used	0.000E+00	-
R017	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
R017	Ring 8	not used	0.000E+00	-
R017	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
R017	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	0.000E+00	1.600E+02	-
R018	Leafy vegetable consumption (kg/yr)	0.000E+00	1.400E+01	-
R018	Milk consumption (L/yr)	0.000E+00	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	0.000E+00	6.300E+01	-
R018	Fish consumption (kg/yr)	0.000E+00	5.400E+00	-
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
R018	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
R018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	0.000E+00	1.000E+00	-
R018	Contamination fraction of irrigation water	0.000E+00	1.000E+00	-
R018	Contamination fraction of aquatic food	0.000E+00	5.000E-01	-
R018	Contamination fraction of plant food	0.000E+00	-1	-
R018	Contamination fraction of meat	0.000E+00	-1	-
R018	Contamination fraction of milk	0.000E+00	-1	-
R019	Livestock fodder intake for meat (kg/day)	0.000E+00	6.800E+01	-
R019	Livestock fodder intake for milk (kg/day)	0.000E+00	5.500E+01	-
R019	Livestock water intake for meat (L/day)	0.000E+00	5.000E+01	-
R019	Livestock water intake for milk (L/day)	0.000E+00	1.600E+02	-
R019	Livestock soil intake (kg/day)	0.000E+00	5.000E-01	-
R019	Mass loading for foliar deposition (g/m**3)	0.000E+00	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	0.000E+00	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	-
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	-
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	-
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	-
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	not used	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	not used	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	not used	3.000E-02	-

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used b (If different
021	Diffusion coefficient for radon gas (m/sec):			
021	in cover material	not used	2.000E-06	-
21	in foundation material	not used	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
21	Average building air exchange rate (1/hr)	0.000E+00	5.000E-01	-
21	Height of the building (room) (m)	not used	2.500E+00	-
021	Building interior area factor	not used	0.000E+00	code computed
021	Building depth below ground surface (m)	not used	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
021	Emanating power of Rn-220 gas	not used	1.500E-01	-

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	active
Find peak pathway doses	suppressed

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	256.00 square meters	U-234	8.500E-02
Thickness:	3.20 meters	U-235	1.400E-02
Cover Depth:	0.00 meters	U-238	9.010E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 15 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	1.00
TDOSE(t):	2.323E-02	2.323E-02	2.323E-02	2.323E-02	2.324E-02	2.327E-02	2.337E-02	2.37
M(t):	1.549E-03	1.549E-03	1.549E-03	1.549E-03	1.549E-03	1.551E-03	1.558E-03	1.58

Maximum TDOSE(t): 2.374E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	1.193E-06	0.0001	1.756E-03	0.0756	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	3.632E-04	0.0156	2.695E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.106E-03	0.1767	1.664E-02	0.7162	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.470E-03	0.1924	1.866E-02	0.8034	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.193E-06	0.0001	1.756E-03	0.0756	1.059E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.632E-04	0.0156	2.696E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.106E-03	0.1767	1.664E-02	0.7162	1.083E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.470E-03	0.1924	1.866E-02	0.8034	1.059E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
I-234	1.193E-06	0.0001	1.756E-03	0.0756	9.524E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.632E-04	0.0156	2.697E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.106E-03	0.1767	1.664E-02	0.7162	2.871E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.470E-03	0.1924	1.866E-02	0.8034	9.525E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.199E-06	0.0001	1.756E-03	0.0756	1.057E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.633E-04	0.0156	2.705E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.106E-03	0.1767	1.664E-02	0.7161	1.059E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.470E-03	0.1924	1.867E-02	0.8034	1.057E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	1.249E-06	0.0001	1.757E-03	0.0756	9.485E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.635E-04	0.0156	2.746E-04	0.0118	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.106E-03	0.1767	1.664E-02	0.7160	2.853E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
otal	4.470E-03	0.1924	1.867E-02	0.8034	9.488E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.802E-06	0.0001	1.759E-03	0.0756	1.043E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.648E-04	0.0157	2.972E-04	0.0128	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.105E-03	0.1764	1.664E-02	0.7152	1.048E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.472E-03	0.1922	1.870E-02	0.8036	1.044E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

acio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	6.505E-06	0.0003	1.766E-03	0.0756	9.084E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.691E-04	0.0158	3.706E-04	0.0159	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	4.105E-03	0.1757	1.665E-02	0.7126	2.760E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
otal	4.480E-03	0.1917	1.879E-02	0.8040	9.112E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

adio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
-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
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
otal	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.456E-05	0.0023	1.789E-03	0.0754	8.992E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.840E-04	0.0162	6.263E-04	0.0264	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.103E-03	0.1728	1.668E-02	0.7026	9.331E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.541E-03	0.1913	1.909E-02	0.8044	9.085E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*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	3.000E+01	1.000E+02	3.000E+
J-234	U-234	1.000E+00	2.078E-02	2.078E-02	2.078E-02	2.077E-02	2.077E-02	2.077E-02	2.075E-
234	Th-230	1.000E+00	0.000E+00	4.614E-07	1.384E-06	4.614E-06	1.384E-05	4.612E-05	1.382E-
234	Ra-226	1.000E+00	0.000E+00	7.277E-10	6.548E-09	7.268E-08	6.521E-07	7.171E-06	6.267E-
J-234	Pb-210	1.000E+00	0.000E+00	1.301E-13	3.458E-12	1.214E-10	2.838E-09	6.928E-08	8.844E-
J-234	∑DSR(j)		2.078E-02	2.078E-02	2.078E-02	2.078E-02	2.079E-02	2.082E-02	2.095E-
J-235	U-235	1.000E+00	4.529E-02	4.529E-02	4.529E-02	4.529E-02	4.529E-02	4.529E-02	4.528E-
J-235	Pa-231	1.000E+00	0.000E+00	4.458E-06	1.337E-05	4.457E-05	1.337E-04	4.453E-04	1.333E-
235	Ac-227	1.000E+00	0.000E+00	3.748E-07	3.303E-06	3.416E-05	2.540E-04	1.662E-03	6.372E-
235	∑DSR(j)		4.529E-02	4.530E-02	4.531E-02	4.537E-02	4.568E-02	4.739E-02	5.298E-
238	U-238	1.000E+00	2.312E-02	2.312E-02	2.312E-02	2.312E-02	2.312E-02	2.312E-02	2.312E-
238	U-234	1.000E+00	0.000E+00	5.890E-08	1.767E-07	5.890E-07	1.767E-06	5.888E-06	1.766E-
J-238	Th-230	1.000E+00	0.000E+00	6.541E-13	5.887E-12	6.541E-11	5.886E-10	6.538E-09	5.879E-
J-238	Ra-226	1.000E+00	0.000E+00	7.023E-16	1.862E-14	6.871E-13	1.851E-11	6.802E-10	1.796E-
238	Pb-210	1.000E+00	0.000E+00	1.584E-19	6.426E-18	8.738E-16	6.298E-14	5.508E-12	2.317E-
J-238	∑DSR(j)		2.312E-02	2.312E-02	2.312E-02	2.312E-02	2.312E-02	2.313E-02	2.313E-

ranch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
e 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 = 15 mrem/yr

clide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
234	7.220E+02	7.220E+02	7.220E+02	7.219E+02	7.216E+02	7.204E+02	7.159E+02
235	3.312E+02	3.312E+02	3.311E+02	3.306E+02	3.284E+02	3.165E+02	2.831E+02
J-238	6.487E+02	6.487E+02	6.487E+02	6.487E+02	6.487E+02	6.486E+02	6.484E+02

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 = 1.000E+03 years

nclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
234	8.500E-02	1.000E+03	2.180E-02	6.882E+02	2.180E-02	6.882E+02
J-235	1.400E-02	1.000E+03	7.245E-02	2.070E+02	7.245E-02	2.070E+02
J-238	9.010E-01	1.000E+03	2.316E-02	6.476E+02	2.316E-02	6.476E+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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	1.766E-03	1.766E-03	1.766E-03	1.766E-03	1.766E-03	1.765E-03	1.764E-
U-234	U-238	1.000E+00	0.000E+00	5.307E-08	1.592E-07	5.307E-07	1.592E-06	5.305E-06	1.591E-
U-234	∑DOSE(j):		1.766E-03	1.766E-03	1.766E-03	1.766E-03	1.767E-03	1.771E-03	1.780E-
Th-230	U-234	1.000E+00	0.000E+00	3.922E-08	1.177E-07	3.922E-07	1.176E-06	3.920E-06	1.174E-
Th-230	U-238	1.000E+00	0.000E+00	5.893E-13	5.304E-12	5.893E-11	5.303E-10	5.891E-09	5.297E-
Th-230	∑DOSE(j):		0.000E+00	3.922E-08	1.177E-07	3.923E-07	1.177E-06	3.926E-06	1.180E-
Ra-226	U-234	1.000E+00	0.000E+00	6.186E-11	5.566E-10	6.177E-09	5.543E-08	6.096E-07	5.327E-
Ra-226	U-238	1.000E+00	0.000E+00	6.327E-16	1.678E-14	6.191E-13	1.668E-11	6.128E-10	1.618E-
Ra-226	∑DOSE(j):		0.000E+00	6.186E-11	5.566E-10	6.178E-09	5.545E-08	6.102E-07	5.343E-
Pb-210	U-234	1.000E+00	0.000E+00	1.106E-14	2.939E-13	1.032E-11	2.412E-10	5.889E-09	7.517E-
Pb-210	U-238	1.000E+00	0.000E+00	1.427E-19	5.790E-18	7.873E-16	5.675E-14	4.962E-12	2.087E-
Pb-210	∑DOSE(j):		0.000E+00	1.106E-14	2.939E-13	1.032E-11	2.413E-10	5.894E-09	7.538E-
U-235	U-235	1.000E+00	6.341E-04	6.341E-04	6.341E-04	6.341E-04	6.341E-04	6.340E-04	6.339E-
Pa-231	U-235	1.000E+00	0.000E+00	6.241E-08	1.872E-07	6.240E-07	1.872E-06	6.234E-06	1.866E-
Ac-227	U-235	1.000E+00	0.000E+00	5.248E-09	4.625E-08	4.783E-07	3.556E-06	2.326E-05	8.921E-
U-238	U-238	1.000E+00	2.083E-02	2.083E-02	2.083E-02	2.083E-02	2.083E-02	2.083E-02	2.083E-

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

clide (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+
I-234	U-234	1.000E+00	8.500E-02	8.500E-02	8.500E-02	8.500E-02	8.499E-02	8.497E-02	8.490E-
234	U-238	1.000E+00	0.000E+00	2.554E-06	7.663E-06	2.554E-05	7.662E-05	2.554E-04	7.658E-
-234	∑S(j):		8.500E-02	8.500E-02	8.501E-02	8.502E-02	8.507E-02	8.522E-02	8.567E-
-230	U-234	1.000E+00	0.000E+00	7.652E-07	2.295E-06	7.651E-06	2.295E-05	7.647E-05	2.291E-
-230	U-238	1.000E+00	0.000E+00	1.150E-11	1.035E-10	1.150E-09	1.035E-08	1.149E-07	1.033E-
Th-230	∑S(j):		0.000E+00	7.652E-07	2.296E-06	7.652E-06	2.296E-05	7.658E-05	2.301E-
-226	U-234	1.000E+00	0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.633E-06	1.427E-
Ra-226	U-238	1.000E+00	0.000E+00	1.695E-15	4.494E-14	1.658E-12	4.468E-11	1.642E-09	4.336E-
Ra-226	∑S(j):		0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.635E-06	1.431E-
-210	U-234	1.000E+00	0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.074E-07	1.158E-
Pb-210	U-238	1.000E+00	0.000E+00	2.199E-17	8.920E-16	1.213E-13	8.743E-12	7.646E-10	3.216E-
-210	∑S(j):		0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.718E-08	9.081E-07	1.161E-
U-235	U-235	1.000E+00	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-
-231	U-235	1.000E+00	0.000E+00	2.962E-07	8.886E-07	2.962E-06	8.883E-06	2.959E-05	8.856E-
Ac-227	U-235	1.000E+00	0.000E+00	4.665E-09	4.112E-08	4.252E-07	3.161E-06	2.068E-05	7.931E-
-238	U-238	1.000E+00	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.009E-01	9.008E-

F(i) is the branch fraction of the parent nuclide.

du = depleted uranium

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
-5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
-5				
5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
-5				
-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
5				
-5	U-234 , fish	1.000E+01	1.000E+01	BIO
5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
5	U-238+D , fish	1.000E+01	1.000E+01	BIO
-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.670E+02	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	8.500E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	1.400E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	9.010E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used b (If different
015	Number of unsaturated zone strata	not used	1	-
015	Unsat. zone 1, thickness (m)	not used	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	-
15	Unsat. zone 1, total porosity	not used	4.000E-01	-
015	Unsat. zone 1, effective porosity	not used	2.000E-01	-
15	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	-
015	Unsat. zone 2, thickness (m)	not used	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	not used	1.500E+00	-
015	Unsat. zone 2, total porosity	not used	4.000E-01	-
015	Unsat. zone 2, effective porosity	not used	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	not used	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	not used	1.000E+01	-
16	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
16	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for U-238			
016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Ac-227			
016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
16	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.10
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	
R017	Mass loading for inhalation (g/m**3)	2.000E-03	1.000E-04	
R017	Exposure duration	9.000E+00	3.000E+01	
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	-
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	
R017	Fraction of time spent outdoors (on site)	3.900E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	-
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
R017	Ring 1	not used	1.000E+00	-
R017	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
R017	Ring 5	not used	0.000E+00	-
R017	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
R017	Ring 8	not used	0.000E+00	-
R017	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
R017	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
R018	Milk consumption (L/yr)	not used	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
R018	Fish consumption (kg/yr)	not used	5.400E+00	-
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	not used	5.100E+02	-
R018	Contamination fraction of drinking water	not used	1.000E+00	-
R018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	not used	1.000E+00	-
R018	Contamination fraction of irrigation water	not used	1.000E+00	-
R018	Contamination fraction of aquatic food	not used	5.000E-01	-
R018	Contamination fraction of plant food	not used	-1	-
R018	Contamination fraction of meat	not used	-1	-
R018	Contamination fraction of milk	not used	-1	-
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
R019	Livestock soil intake (kg/day)	not used	5.000E-01	-
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	not used	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	not used	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	not used	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	not used	3.000E-02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
021	Diffusion coefficient for radon gas (m/sec):			
021	in cover material	not used	2.000E-06	-
21	in foundation material	not used	3.000E-07	-
021	in contaminated zone soil	2.000E-06	2.000E-06	-
021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
21	Average building air exchange rate (1/hr)	0.000E+00	5.000E-01	-
21	Height of the building (room) (m)	not used	2.500E+00	-
021	Building interior area factor	not used	0.000E+00	code computed
021	Building depth below ground surface (m)	not used	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
021	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	167.00 square meters
Thickness:	1.30 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
U-234	8.500E-02
U-235	1.400E-02
U-238	9.010E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 15 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	1.00
TDOSE(t):	2.225E-02	2.225E-02	2.225E-02	2.225E-02	2.226E-02	2.228E-02	2.237E-02	2.27
M(t):	1.483E-03	1.483E-03	1.483E-03	1.483E-03	1.484E-03	1.485E-03	1.491E-03	1.51

Maximum TDOSE(t): 2.270E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	1.168E-06	0.0001	1.678E-03	0.0754	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.544E-04	0.0159	2.575E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	3.996E-03	0.1796	1.590E-02	0.7146	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.351E-03	0.1956	1.783E-02	0.8015	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.168E-06	0.0001	1.678E-03	0.0754	6.016E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.545E-04	0.0159	2.576E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	3.996E-03	0.1796	1.590E-02	0.7146	6.886E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.351E-03	0.1956	1.783E-02	0.8015	6.016E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
ıclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.168E-06	0.0001	1.678E-03	0.0754	5.409E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.545E-04	0.0159	2.577E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	3.996E-03	0.1796	1.590E-02	0.7146	1.631E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.351E-03	0.1956	1.783E-02	0.8015	5.410E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

ɜum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.174E-06	0.0001	1.678E-03	0.0754	5.992E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.545E-04	0.0159	2.585E-04	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	3.996E-03	0.1796	1.590E-02	0.7145	6.005E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.351E-03	0.1956	1.784E-02	0.8016	5.993E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	1.222E-06	0.0001	1.679E-03	0.0754	5.345E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.547E-04	0.0159	2.624E-04	0.0118	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	3.995E-03	0.1795	1.590E-02	0.7144	1.608E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.351E-03	0.1955	1.784E-02	0.8016	5.347E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.760E-06	0.0001	1.681E-03	0.0754	5.745E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.559E-04	0.0160	2.839E-04	0.0127	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	3.995E-03	0.1793	1.590E-02	0.7136	5.776E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.352E-03	0.1953	1.786E-02	0.8018	5.751E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	6.330E-06	0.0003	1.686E-03	0.0754	4.602E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	3.600E-04	0.0161	3.539E-04	0.0158	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	3.993E-03	0.1785	1.590E-02	0.7110	1.398E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.359E-03	0.1949	1.794E-02	0.8022	4.615E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
J-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
-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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.248E-05	0.0023	1.707E-03	0.0752	1.789E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.754E-04	0.0165	5.976E-04	0.0263	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	3.986E-03	0.1756	1.591E-02	0.7011	1.856E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.414E-03	0.1945	1.822E-02	0.8026	1.807E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*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	3.000E+01	1.000E+02	3.000E+
J-234	U-234	1.000E+00	1.982E-02	1.982E-02	1.982E-02	1.982E-02	1.982E-02	1.981E-02	1.979E-
234	Th-230	1.000E+00	0.000E+00	4.404E-07	1.321E-06	4.403E-06	1.321E-05	4.401E-05	1.318E-
234	Ra-226	1.000E+00	0.000E+00	7.071E-10	6.362E-09	7.061E-08	6.336E-07	6.967E-06	6.088E-
J-234	Pb-210	1.000E+00	0.000E+00	1.083E-13	2.879E-12	1.011E-10	2.362E-09	5.767E-08	7.360E-
234	∑DSR(j)		1.982E-02	1.982E-02	1.982E-02	1.982E-02	1.983E-02	1.986E-02	1.998E-
J-235	U-235	1.000E+00	4.377E-02	4.377E-02	4.377E-02	4.377E-02	4.377E-02	4.376E-02	4.375E-
J-235	Pa-231	1.000E+00	0.000E+00	4.237E-06	1.271E-05	4.237E-05	1.271E-04	4.232E-04	1.266E-
235	Ac-227	1.000E+00	0.000E+00	3.580E-07	3.155E-06	3.263E-05	2.426E-04	1.587E-03	6.084E-
J-235	∑DSR(j)		4.377E-02	4.378E-02	4.379E-02	4.385E-02	4.414E-02	4.577E-02	5.110E-
238	U-238	1.000E+00	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.213E-
238	U-234	1.000E+00	0.000E+00	5.619E-08	1.686E-07	5.619E-07	1.685E-06	5.617E-06	1.684E-
J-238	Th-230	1.000E+00	0.000E+00	6.242E-13	5.618E-12	6.242E-11	5.617E-10	6.239E-09	5.609E-
238	Ra-226	1.000E+00	0.000E+00	7.635E-16	1.809E-14	6.676E-13	1.798E-11	6.608E-10	1.745E-
238	Pb-210	1.000E+00	0.000E+00	0.000E+00	4.560E-18	7.260E-16	5.243E-14	4.584E-12	1.928E-
J-238	∑DSR(j)		2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.215E-

ranch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
he 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 = 15 mrem/yr

clide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
234	7.568E+02	7.568E+02	7.568E+02	7.567E+02	7.564E+02	7.553E+02	7.506E+02
235	3.427E+02	3.426E+02	3.425E+02	3.421E+02	3.398E+02	3.277E+02	2.936E+02
J-238	6.774E+02	6.774E+02	6.774E+02	6.774E+02	6.774E+02	6.774E+02	6.773E+02

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 = 1.000E+03 years

uclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
234	8.500E-02	1.000E+03	2.077E-02	7.221E+02	2.077E-02	7.221E+02
J-235	1.400E-02	1.000E+03	6.969E-02	2.152E+02	6.969E-02	2.152E+02
J-238	9.010E-01	1.000E+03	2.215E-02	6.772E+02	2.215E-02	6.772E+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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	1.685E-03	1.685E-03	1.685E-03	1.685E-03	1.684E-03	1.684E-03	1.682E-
U-234	U-238	1.000E+00	0.000E+00	5.063E-08	1.519E-07	5.062E-07	1.519E-06	5.061E-06	1.517E-
U-234	∑DOSE(j):		1.685E-03	1.685E-03	1.685E-03	1.685E-03	1.686E-03	1.689E-03	1.697E-
Th-230	U-234	1.000E+00	0.000E+00	3.743E-08	1.123E-07	3.743E-07	1.123E-06	3.741E-06	1.121E-
Th-230	U-238	1.000E+00	0.000E+00	5.624E-13	5.062E-12	5.624E-11	5.061E-10	5.621E-09	5.054E-
Th-230	∑DOSE(j):		0.000E+00	3.743E-08	1.123E-07	3.743E-07	1.123E-06	3.746E-06	1.126E-
Ra-226	U-234	1.000E+00	0.000E+00	6.010E-11	5.408E-10	6.002E-09	5.386E-08	5.922E-07	5.175E-
Ra-226	U-238	1.000E+00	0.000E+00	6.880E-16	1.630E-14	6.015E-13	1.620E-11	5.954E-10	1.572E-
Ra-226	∑DOSE(j):		0.000E+00	6.010E-11	5.408E-10	6.003E-09	5.387E-08	5.928E-07	5.191E-
Pb-210	U-234	1.000E+00	0.000E+00	9.205E-15	2.447E-13	8.590E-12	2.008E-10	4.902E-09	6.256E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	4.109E-18	6.542E-16	4.724E-14	4.131E-12	1.737E-
Pb-210	∑DOSE(j):		0.000E+00	9.205E-15	2.447E-13	8.591E-12	2.009E-10	4.906E-09	6.274E-
U-235	U-235	1.000E+00	6.128E-04	6.128E-04	6.128E-04	6.128E-04	6.128E-04	6.127E-04	6.124E-
Pa-231	U-235	1.000E+00	0.000E+00	5.932E-08	1.780E-07	5.932E-07	1.779E-06	5.925E-06	1.773E-
Ac-227	U-235	1.000E+00	0.000E+00	5.013E-09	4.418E-08	4.568E-07	3.396E-06	2.222E-05	8.517E-
U-238	U-238	1.000E+00	1.995E-02	1.995E-02	1.995E-02	1.995E-02	1.995E-02	1.995E-02	1.994E-

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

nclide (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+
-234	U-234	1.000E+00	8.500E-02	8.500E-02	8.500E-02	8.500E-02	8.499E-02	8.496E-02	8.487E-
234	U-238	1.000E+00	0.000E+00	2.554E-06	7.663E-06	2.554E-05	7.662E-05	2.553E-04	7.655E-
234	∑S(j):		8.500E-02	8.500E-02	8.501E-02	8.502E-02	8.506E-02	8.521E-02	8.564E-
-230	U-234	1.000E+00	0.000E+00	7.652E-07	2.295E-06	7.651E-06	2.295E-05	7.646E-05	2.291E-
-230	U-238	1.000E+00	0.000E+00	1.150E-11	1.035E-10	1.150E-09	1.035E-08	1.149E-07	1.033E-
h-230	∑S(j):		0.000E+00	7.652E-07	2.296E-06	7.652E-06	2.296E-05	7.658E-05	2.301E-
-226	U-234	1.000E+00	0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.633E-06	1.427E-
a-226	U-238	1.000E+00	0.000E+00	1.897E-15	4.495E-14	1.659E-12	4.467E-11	1.642E-09	4.335E-
a-226	∑S(j):		0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.635E-06	1.431E-
-210	U-234	1.000E+00	0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.073E-07	1.158E-
b-210	U-238	1.000E+00	0.000E+00	0.000E+00	7.604E-16	1.211E-13	8.743E-12	7.645E-10	3.215E-
-210	∑S(j):		0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.081E-07	1.161E-
-235	U-235	1.000E+00	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.399E-
-231	U-235	1.000E+00	0.000E+00	2.962E-07	8.886E-07	2.962E-06	8.883E-06	2.958E-05	8.852E-
c-227	U-235	1.000E+00	0.000E+00	4.665E-09	4.111E-08	4.252E-07	3.161E-06	2.068E-05	7.927E-
238	U-238	1.000E+00	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.009E-01	9.008E-01	9.004E-

RF(i) is the branch fraction of the parent nuclide.

Trailuser

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

enu	Parameter	Current Value	Default	Pa
)-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
·34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
·34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
)-5	Bioaccumulation factors, fresh water, L/kg:			
·5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
)-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
)-5				
·5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
·5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
)-5				
·5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
·5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
)-5				
)-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
·5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
)-5				
)-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
·5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
·5				
)-5	U-234 , fish	1.000E+01	1.000E+01	BIO
·5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
·5				
)-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
·5				
·5	U-238+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.670E+02	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	5.070E-01	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	2.300E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	4.700E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
U015	Number of unsaturated zone strata	not used	1	-
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	-
15	Unsat. zone 1, total porosity	not used	4.000E-01	-
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	-
15	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	-
015	Unsat. zone 2, thickness (m)	not used	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	not used	1.500E+00	-
U015	Unsat. zone 2, total porosity	not used	4.000E-01	-
R015	Unsat. zone 2, effective porosity	not used	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	not used	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	not used	1.000E+01	-
16	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
U016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
U016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
16	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for daughter Ac-227			
16	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
16	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.10
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	2.000E+04	8.400E+03	
R017	Mass loading for inhalation (g/m**3)	2.000E-03	1.000E-04	
R017	Exposure duration	9.000E+00	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	
R017	Fraction of time spent outdoors (on site)	3.900E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
17	Outer annular radius (m), ring 2:	not used	7.071E+01	-
17	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
17	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
17	Outer annular radius (m), ring 9:	not used	0.000E+00	-
017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
17	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
017	Ring 1	not used	1.000E+00	-
17	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
17	Ring 5	not used	0.000E+00	-
17	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
17	Ring 8	not used	0.000E+00	-
17	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
17	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
18	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
018	Milk consumption (L/yr)	not used	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
018	Fish consumption (kg/yr)	not used	5.400E+00	-
18	Other seafood consumption (kg/yr)	not used	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	not used	5.100E+02	-
018	Contamination fraction of drinking water	not used	1.000E+00	-
R018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	not used	1.000E+00	-
018	Contamination fraction of irrigation water	not used	1.000E+00	-
018	Contamination fraction of aquatic food	not used	5.000E-01	-
R018	Contamination fraction of plant food	not used	-1	-
R018	Contamination fraction of meat	not used	-1	-
018	Contamination fraction of milk	not used	-1	-
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
019	Livestock soil intake (kg/day)	not used	5.000E-01	-
019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	not used	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	not used	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	not used	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	not used	3.000E-02	-

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used b (If different
021	Diffusion coefficient for radon gas (m/sec):			
021	in cover material	not used	2.000E-06	-
21	in foundation material	not used	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
021	Average building air exchange rate (1/hr)	0.000E+00	5.000E-01	-
21	Height of the building (room) (m)	not used	2.500E+00	-
021	Building interior area factor	not used	0.000E+00	code computed
021	Building depth below ground surface (m)	not used	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
021	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	167.00 square meters	U-234	5.070E-01
Thickness:	1.30 meters	U-235	2.300E-02
Cover Depth:	0.00 meters	U-238	4.700E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 15 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	1.00
TDOSE(t):	2.146E-02	2.146E-02	2.146E-02	2.147E-02	2.148E-02	2.153E-02	2.172E-02	2.25
M(t):	1.431E-03	1.431E-03	1.431E-03	1.431E-03	1.432E-03	1.435E-03	1.448E-03	1.50

Maximum TDOSE(t): 2.255E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	6.965E-06	0.0003	1.001E-02	0.4663	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	5.823E-04	0.0271	4.230E-04	0.0197	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	2.084E-03	0.0971	8.293E-03	0.3864	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.674E-03	0.1246	1.872E-02	0.8724	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

:um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	6.965E-06	0.0003	1.001E-02	0.4663	3.588E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	5.823E-04	0.0271	4.231E-04	0.0197	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.084E-03	0.0971	8.293E-03	0.3864	3.592E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.674E-03	0.1246	1.872E-02	0.8724	3.588E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	6.968E-06	0.0003	1.001E-02	0.4663	3.227E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	5.823E-04	0.0271	4.234E-04	0.0197	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	2.084E-03	0.0971	8.293E-03	0.3864	8.507E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.674E-03	0.1246	1.872E-02	0.8724	3.227E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	7.002E-06	0.0003	1.001E-02	0.4663	3.574E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	5.824E-04	0.0271	4.247E-04	0.0198	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.084E-03	0.0971	8.293E-03	0.3863	3.132E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.674E-03	0.1245	1.873E-02	0.8724	3.574E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	7.289E-06	0.0003	1.001E-02	0.4662	3.188E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	5.827E-04	0.0271	4.310E-04	0.0201	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.084E-03	0.0970	8.294E-03	0.3862	8.388E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.674E-03	0.1245	1.874E-02	0.8724	3.188E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.050E-05	0.0005	1.002E-02	0.4656	3.427E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	5.847E-04	0.0272	4.664E-04	0.0217	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.084E-03	0.0968	8.294E-03	0.3852	3.013E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.679E-03	0.1244	1.879E-02	0.8725	3.427E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	3.775E-05	0.0017	1.006E-02	0.4632	2.745E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	5.914E-04	0.0272	5.815E-04	0.0268	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	2.083E-03	0.0959	8.296E-03	0.3820	7.292E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.712E-03	0.1249	1.894E-02	0.8720	2.745E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.130E-04	0.0139	1.018E-02	0.4516	1.067E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	6.168E-04	0.0274	9.818E-04	0.0435	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.079E-03	0.0922	8.301E-03	0.3682	9.683E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	3.009E-03	0.1335	1.947E-02	0.8634	1.068E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

arent 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+
J-234	U-234	1.000E+00	1.982E-02	1.982E-02	1.982E-02	1.982E-02	1.982E-02	1.981E-02	1.979E-
234	Th-230	1.000E+00	0.000E+00	4.404E-07	1.321E-06	4.403E-06	1.321E-05	4.401E-05	1.318E-
234	Ra-226	1.000E+00	0.000E+00	7.071E-10	6.362E-09	7.061E-08	6.336E-07	6.967E-06	6.088E-
J-234	Pb-210	1.000E+00	0.000E+00	1.083E-13	2.879E-12	1.011E-10	2.362E-09	5.767E-08	7.360E-
234	∑DSR(j)		1.982E-02	1.982E-02	1.982E-02	1.982E-02	1.983E-02	1.986E-02	1.998E-
J-235	U-235	1.000E+00	4.377E-02	4.377E-02	4.377E-02	4.377E-02	4.377E-02	4.376E-02	4.375E-
235	Pa-231	1.000E+00	0.000E+00	4.237E-06	1.271E-05	4.237E-05	1.271E-04	4.232E-04	1.266E-
235	Ac-227	1.000E+00	0.000E+00	3.580E-07	3.155E-06	3.263E-05	2.426E-04	1.587E-03	6.084E-
235	∑DSR(j)		4.377E-02	4.378E-02	4.379E-02	4.385E-02	4.414E-02	4.577E-02	5.110E-
238	U-238	1.000E+00	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.213E-
238	U-234	1.000E+00	0.000E+00	5.619E-08	1.686E-07	5.619E-07	1.685E-06	5.617E-06	1.684E-
J-238	Th-230	1.000E+00	0.000E+00	6.242E-13	5.618E-12	6.242E-11	5.617E-10	6.239E-09	5.609E-
238	Ra-226	1.000E+00	0.000E+00	7.635E-16	1.809E-14	6.676E-13	1.798E-11	6.608E-10	1.745E-
238	Pb-210	1.000E+00	0.000E+00	0.000E+00	4.560E-18	7.260E-16	5.243E-14	4.584E-12	1.928E-
J-238	∑DSR(j)		2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.214E-02	2.215E-

* ranch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
he 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 = 15 mrem/yr

clide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
234	7.568E+02	7.568E+02	7.568E+02	7.567E+02	7.564E+02	7.553E+02	7.506E+02
235	3.427E+02	3.426E+02	3.425E+02	3.421E+02	3.398E+02	3.277E+02	2.936E+02
J-238	6.774E+02	6.774E+02	6.774E+02	6.774E+02	6.774E+02	6.774E+02	6.773E+02

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 = 1.000E+03 years

clide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
234	5.070E-01	1.000E+03	2.077E-02	7.221E+02	2.077E-02	7.221E+02
J-235	2.300E-02	1.000E+03	6.969E-02	2.152E+02	6.969E-02	2.152E+02
J-238	4.700E-01	1.000E+03	2.215E-02	6.772E+02	2.215E-02	6.772E+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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.004E-02	1.003E-
U-234	U-238	1.000E+00	0.000E+00	2.641E-08	7.923E-08	2.641E-07	7.922E-07	2.640E-06	7.914E-
U-234	∑DOSE(j):		1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.004E-
Th-230	U-234	1.000E+00	0.000E+00	2.233E-07	6.698E-07	2.233E-06	6.697E-06	2.231E-05	6.684E-
Th-230	U-238	1.000E+00	0.000E+00	2.934E-13	2.640E-12	2.934E-11	2.640E-10	2.932E-09	2.636E-
Th-230	∑DOSE(j):		0.000E+00	2.233E-07	6.698E-07	2.233E-06	6.697E-06	2.231E-05	6.687E-
Ra-226	U-234	1.000E+00	0.000E+00	3.585E-10	3.225E-09	3.580E-08	3.212E-07	3.532E-06	3.087E-
Ra-226	U-238	1.000E+00	0.000E+00	3.589E-16	8.505E-15	3.138E-13	8.452E-12	3.106E-10	8.201E-
Ra-226	∑DOSE(j):		0.000E+00	3.585E-10	3.225E-09	3.580E-08	3.213E-07	3.533E-06	3.087E-
Pb-210	U-234	1.000E+00	0.000E+00	5.491E-14	1.460E-12	5.124E-11	1.198E-09	2.924E-08	3.732E
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	2.143E-18	3.412E-16	2.464E-14	2.155E-12	9.062E-
Pb-210	∑DOSE(j):		0.000E+00	5.491E-14	1.460E-12	5.124E-11	1.198E-09	2.924E-08	3.733E
U-235	U-235	1.000E+00	1.007E-03	1.007E-03	1.007E-03	1.007E-03	1.007E-03	1.007E-03	1.006E-
Pa-231	U-235	1.000E+00	0.000E+00	9.746E-08	2.924E-07	9.745E-07	2.923E-06	9.734E-06	2.913E
Ac-227	U-235	1.000E+00	0.000E+00	8.235E-09	7.257E-08	7.505E-07	5.580E-06	3.650E-05	1.399E-
U-238	U-238	1.000E+00	1.041E-02	1.041E-02	1.041E-02	1.041E-02	1.041E-02	1.041E-02	1.040E

BRF(i) is the branch fraction of the parent nuclide.

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+
J-234	U-234	1.000E+00	5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.069E-01	5.067E-01	5.062E-
234	U-238	1.000E+00	0.000E+00	1.332E-06	3.997E-06	1.332E-05	3.997E-05	1.332E-04	3.993E-
234	∑S(j):		5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.069E-01	5.066E-
Th-230	U-234	1.000E+00	0.000E+00	4.564E-06	1.369E-05	4.564E-05	1.369E-04	4.561E-04	1.366E-
-230	U-238	1.000E+00	0.000E+00	5.997E-12	5.397E-11	5.997E-10	5.397E-09	5.994E-08	5.389E-
Th-230	∑S(j):		0.000E+00	4.564E-06	1.369E-05	4.564E-05	1.369E-04	4.561E-04	1.367E-
-226	U-234	1.000E+00	0.000E+00	9.884E-10	8.893E-09	9.871E-08	8.858E-07	9.740E-06	8.511E-
-226	U-238	1.000E+00	0.000E+00	9.895E-16	2.345E-14	8.652E-13	2.330E-11	8.563E-10	2.261E-
Ra-226	∑S(j):		0.000E+00	9.884E-10	8.893E-09	9.871E-08	8.858E-07	9.740E-06	8.513E-
-210	U-234	1.000E+00	0.000E+00	1.016E-11	2.701E-10	9.483E-09	2.217E-07	5.412E-06	6.907E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	3.967E-16	6.316E-14	4.561E-12	3.988E-10	1.677E-
Pb-210	∑S(j):		0.000E+00	1.016E-11	2.701E-10	9.483E-09	2.217E-07	5.412E-06	6.908E-
-235	U-235	1.000E+00	2.300E-02	2.300E-02	2.300E-02	2.300E-02	2.300E-02	2.299E-02	2.298E-
-231	U-235	1.000E+00	0.000E+00	4.866E-07	1.460E-06	4.866E-06	1.459E-05	4.860E-05	1.454E-
Ac-227	U-235	1.000E+00	0.000E+00	7.665E-09	6.755E-08	6.985E-07	5.193E-06	3.397E-05	1.302E-
-238	U-238	1.000E+00	4.700E-01	4.700E-01	4.700E-01	4.700E-01	4.700E-01	4.699E-01	4.697E-

BRF(i) is the branch fraction of the parent nuclide.

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
)-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
)-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
)-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
)-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
)-5				
5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
)-5				
)-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
)-5				
)-5	U-234 , fish	1.000E+01	1.000E+01	BIO
5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.210E+03	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	8.500E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	1.400E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	9.010E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R015	Number of unsaturated zone strata	2	1	-
R015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
R015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
R015	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
R016	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
16	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Ac-227			
16	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
16	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.1
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	1.490E+04	8.400E+03	-
R017	Mass loading for inhalation (g/m**3)	9.000E-05	1.000E-04	-
R017	Exposure duration	2.500E+01	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	-
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	-
R017	Fraction of time spent indoors	1.840E-01	5.000E-01	-
R017	Fraction of time spent outdoors (on site)	4.600E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	-
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	-
RC17	Fractions of annular areas within AREA:			
RC17	Ring 1	not used	1.000E+00	-
RC17	Ring 2	not used	2.732E-01	-
RC17	Ring 3	not used	0.000E+00	-
RC17	Ring 4	not used	0.000E+00	-
RC17	Ring 5	not used	0.000E+00	-
RC17	Ring 6	not used	0.000E+00	-
RC17	Ring 7	not used	0.000E+00	-
RC17	Ring 8	not used	0.000E+00	-
RC17	Ring 9	not used	0.000E+00	-
RC17	Ring 10	not used	0.000E+00	-
RC17	Ring 11	not used	0.000E+00	-
RC17	Ring 12	not used	0.000E+00	-
RC18	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
RC18	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
RC18	Milk consumption (L/yr)	not used	9.200E+01	-
RC18	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
RC18	Fish consumption (kg/yr)	not used	5.400E+00	-
RC18	Other seafood consumption (kg/yr)	not used	9.000E-01	-
RC18	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
RC18	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
RC18	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
RC18	Contamination fraction of household water	0.000E+00	1.000E+00	-
RC18	Contamination fraction of livestock water	not used	1.000E+00	-
RC18	Contamination fraction of irrigation water	not used	1.000E+00	-
RC18	Contamination fraction of aquatic food	not used	5.000E-01	-
RC18	Contamination fraction of plant food	not used	-1	-
RC18	Contamination fraction of meat	not used	-1	-
RC18	Contamination fraction of milk	not used	-1	-
RC19	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
RC19	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
RC19	Livestock water intake for meat (L/day)	not used	5.000E+01	-
RC19	Livestock water intake for milk (L/day)	not used	1.600E+02	-
RC19	Livestock soil intake (kg/day)	not used	5.000E-01	-
RC19	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R021	Diffusion coefficient for radon gas (m/sec):			
R021	in cover material	not used	2.000E-06	-
21	in foundation material	3.000E-07	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
21	Average building air exchange rate (1/hr)	1.000E+00	5.000E-01	-
21	Height of the building (room) (m)	2.500E+00	2.500E+00	-
R021	Building interior area factor	0.000E+00	0.000E+00	code computed
R021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
R021	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1210.00 square meters	U-234	8.500E-02
Thickness:	1.30 meters	U-235	1.400E-02
Cover Depth:	0.00 meters	U-238	9.010E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 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	1.00
TDOSE(t):	2.567E-02	2.567E-02	2.567E-02	2.567E-02	2.567E-02	2.570E-02	2.586E-02	2.72
M(t):	8.557E-04	8.557E-04	8.557E-04	8.557E-04	8.558E-04	8.567E-04	8.619E-04	9.08

Maximum TDOSE(t): 2.724E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.561E-06	0.0002	2.127E-04	0.0083	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	1.699E-03	0.0662	3.265E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	1.944E-02	0.7572	2.016E-03	0.0785	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.114E-02	0.8236	2.261E-03	0.0881	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
U-234	5.561E-06	0.0002	2.128E-04	0.0083	1.346E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.000
U-235	1.699E-03	0.0662	3.266E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000
U-238	1.944E-02	0.7572	2.016E-03	0.0785	1.541E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.000
Total	2.114E-02	0.8236	2.261E-03	0.0881	1.346E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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	0.000
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	0.000
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	0.000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	5.564E-06	0.0002	2.128E-04	0.0083	1.211E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	1.699E-03	0.0662	3.268E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.944E-02	0.7572	2.016E-03	0.0785	3.652E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.114E-02	0.8236	2.261E-03	0.0881	1.211E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.591E-06	0.0002	2.128E-04	0.0083	1.344E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.699E-03	0.0662	3.278E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.944E-02	0.7571	2.016E-03	0.0785	1.347E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.114E-02	0.8235	2.262E-03	0.0881	1.344E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	5.826E-06	0.0002	2.129E-04	0.0083	1.204E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
J-235	1.700E-03	0.0662	3.327E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.944E-02	0.7570	2.016E-03	0.0785	3.622E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.114E-02	0.8235	2.262E-03	0.0881	1.204E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
U-234	8.450E-06	0.0003	2.131E-04	0.0083	1.317E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.706E-03	0.0664	3.600E-05	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.943E-02	0.7562	2.016E-03	0.0785	1.324E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.115E-02	0.8229	2.265E-03	0.0881	1.318E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	3.074E-05	0.0012	2.139E-04	0.0083	1.126E-04	0.0044	0.000E+00	0.0000	0.000E+00	0.0000
235	1.726E-03	0.0667	4.488E-05	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.942E-02	0.7512	2.017E-03	0.0780	3.421E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.118E-02	0.8192	2.275E-03	0.0880	1.129E-04	0.0044	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
U-234	2.605E-04	0.0096	2.165E-04	0.0079	8.075E-04	0.0296	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.830E-03	0.0672	7.578E-05	0.0028	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.968E-02	0.7225	2.018E-03	0.0741	8.378E-06	0.0003	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.177E-02	0.7992	2.310E-03	0.0848	8.158E-04	0.0299	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	4.944E-03	4.944E-03	4.944E-03	4.944E-03	4.943E-03	4.942E-03	4.937E-
·234	Th-230	1.000E+00	0.000E+00	9.882E-08	2.964E-07	9.881E-07	2.964E-06	9.875E-06	2.958E-
·234	Ra-226	1.000E+00	0.000E+00	1.929E-08	1.736E-07	1.926E-06	1.726E-05	1.890E-04	1.622E-
U-234	Pb-210	1.000E+00	0.000E+00	1.252E-12	3.328E-11	1.168E-09	2.731E-08	6.667E-07	8.509E-
·234	∑DSR(j)		4.944E-03	4.944E-03	4.945E-03	4.947E-03	4.964E-03	5.141E-03	6.597E-
U-235	U-235	1.000E+00	1.259E-01	1.259E-01	1.259E-01	1.259E-01	1.259E-01	1.259E-01	1.258E-
U-235	Pa-231	1.000E+00	0.000E+00	3.042E-06	9.124E-06	3.041E-05	9.121E-05	3.038E-04	9.090E-
·235	Ac-227	1.000E+00	0.000E+00	1.899E-07	1.674E-06	1.731E-05	1.287E-04	8.419E-04	3.227E-
U-235	∑DSR(j)		1.259E-01	1.259E-01	1.259E-01	1.260E-01	1.261E-01	1.270E-01	1.300E-
·238	U-238	1.000E+00	2.607E-02	2.607E-02	2.607E-02	2.607E-02	2.607E-02	2.606E-02	2.605E-
·238	U-234	1.000E+00	0.000E+00	1.402E-08	4.205E-08	1.402E-07	4.204E-07	1.401E-06	4.200E-
U-238	Th-230	1.000E+00	0.000E+00	1.401E-13	1.261E-12	1.401E-11	1.260E-10	1.400E-09	1.259E-
·238	Ra-226	1.000E+00	0.000E+00	2.084E-14	4.937E-13	1.821E-11	4.899E-10	1.792E-08	4.649E-
·238	Pb-210	1.000E+00	0.000E+00	0.000E+00	5.272E-17	8.394E-15	6.061E-13	5.300E-11	2.229E-
U-238	∑DSR(j)		2.607E-02	2.607E-02	2.607E-02	2.607E-02	2.607E-02	2.606E-02	2.606E-

ranch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
ne 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 = 30 mrem/yr

clide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
·234	6.068E+03	6.068E+03	6.067E+03	6.065E+03	6.044E+03	5.835E+03	4.548E+03
·235	2.382E+02	2.382E+02	2.382E+02	2.381E+02	2.378E+02	2.361E+02	2.308E+02
U-238	1.151E+03	1.151E+03	1.151E+03	1.151E+03	1.151E+03	1.151E+03	1.151E+03

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 = 1.000E+03 years

clide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
-234	8.500E-02	1.000E+03	1.763E-02	1.702E+03	1.763E-02	1.702E+03
U-235	1.400E-02	1.000E+03	1.427E-01	2.102E+02	1.427E-01	2.102E+02
U-238	9.010E-01	1.000E+03	2.636E-02	1.138E+03	2.636E-02	1.138E+03

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+
U-234	U-234	1.000E+00	4.203E-04	4.202E-04	4.202E-04	4.202E-04	4.202E-04	4.200E-04	4.196E-
U-234	U-238	1.000E+00	0.000E+00	1.263E-08	3.789E-08	1.263E-07	3.788E-07	1.262E-06	3.785E-
U-234	∑DOSE(j):		4.203E-04	4.203E-04	4.203E-04	4.204E-04	4.206E-04	4.213E-04	4.234E-
Th-230	U-234	1.000E+00	0.000E+00	8.399E-09	2.520E-08	8.399E-08	2.519E-07	8.394E-07	2.515E-
Th-230	U-238	1.000E+00	0.000E+00	1.262E-13	1.136E-12	1.262E-11	1.136E-10	1.261E-09	1.134E-
Th-230	∑DOSE(j):		0.000E+00	8.399E-09	2.520E-08	8.400E-08	2.520E-07	8.406E-07	2.526E-
Ra-226	U-234	1.000E+00	0.000E+00	1.640E-09	1.475E-08	1.637E-07	1.467E-06	1.606E-05	1.379E-
Ra-226	U-238	1.000E+00	0.000E+00	1.877E-14	4.448E-13	1.641E-11	4.414E-10	1.615E-08	4.189E-
Ra-226	∑DOSE(j):		0.000E+00	1.640E-09	1.475E-08	1.637E-07	1.468E-06	1.608E-05	1.383E-
Pb-210	U-234	1.000E+00	0.000E+00	1.064E-13	2.829E-12	9.931E-11	2.322E-09	5.667E-08	7.233E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	4.750E-17	7.563E-15	5.461E-13	4.775E-11	2.008E-
Pb-210	∑DOSE(j):		0.000E+00	1.064E-13	2.829E-12	9.932E-11	2.322E-09	5.672E-08	7.253E-
U-235	U-235	1.000E+00	1.763E-03	1.763E-03	1.763E-03	1.763E-03	1.763E-03	1.763E-03	1.762E-
Pa-231	U-235	1.000E+00	0.000E+00	4.258E-08	1.277E-07	4.258E-07	1.277E-06	4.253E-06	1.273E-
Ac-227	U-235	1.000E+00	0.000E+00	2.659E-09	2.343E-08	2.423E-07	1.802E-06	1.179E-05	4.518E-
U-238	U-238	1.000E+00	2.349E-02	2.349E-02	2.349E-02	2.349E-02	2.349E-02	2.348E-02	2.347E-

BRF(i) is the branch fraction of the parent nuclide.

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+
J-234	U-234	1.000E+00	8.500E-02	8.500E-02	8.500E-02	8.500E-02	8.499E-02	8.496E-02	8.487E-
234	U-238	1.000E+00	0.000E+00	2.554E-06	7.663E-06	2.554E-05	7.662E-05	2.553E-04	7.655E-
234	∑S(j):		8.500E-02	8.500E-02	8.501E-02	8.502E-02	8.506E-02	8.521E-02	8.564E-
-230	U-234	1.000E+00	0.000E+00	7.652E-07	2.295E-06	7.651E-06	2.295E-05	7.646E-05	2.291E-
-230	U-238	1.000E+00	0.000E+00	1.150E-11	1.035E-10	1.150E-09	1.035E-08	1.149E-07	1.033E-
Th-230	∑S(j):		0.000E+00	7.652E-07	2.296E-06	7.652E-06	2.296E-05	7.658E-05	2.301E-
-226	U-234	1.000E+00	0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.633E-06	1.427E-
Ra-226	U-238	1.000E+00	0.000E+00	1.897E-15	4.495E-14	1.659E-12	4.467E-11	1.642E-09	4.335E-
Ra-226	∑S(j):		0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.635E-06	1.431E-
-210	U-234	1.000E+00	0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.073E-07	1.158E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	7.604E-16	1.211E-13	8.743E-12	7.645E-10	3.215E-
-210	∑S(j):		0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.081E-07	1.161E-
J-235	U-235	1.000E+00	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.399E-
-231	U-235	1.000E+00	0.000E+00	2.962E-07	8.886E-07	2.962E-06	8.883E-06	2.958E-05	8.852E-
Ac-227	U-235	1.000E+00	0.000E+00	4.665E-09	4.111E-08	4.252E-07	3.161E-06	2.068E-05	7.927E-
238	U-238	1.000E+00	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.009E-01	9.008E-01	9.004E-

BRF(i) is the branch fraction of the parent nuclide.

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

enu	Parameter	Current Value	Default	Pa
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
-5	Bioaccumulation factors, fresh water, L/kg:			
-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
D-5				
-5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
D-5				
-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
D-5				
-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIO
-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.670E+02	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	8.500E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	1.400E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	9.010E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R015	Number of unsaturated zone strata	2	1	-
R015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
R015	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
016	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
16	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Ac-227			
016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
16	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.10
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	1.490E+04	8.400E+03	
R017	Mass loading for inhalation (g/m**3)	9.000E-05	1.000E-04	
R017	Exposure duration	2.500E+01	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	
R017	Fraction of time spent indoors	1.840E-01	5.000E-01	
R017	Fraction of time spent outdoors (on site)	4.600E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	-
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
R017	Ring 1	not used	1.000E+00	-
R017	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
R017	Ring 5	not used	0.000E+00	-
R017	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
R017	Ring 8	not used	0.000E+00	-
R017	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
R017	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
R018	Milk consumption (L/yr)	not used	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
R018	Fish consumption (kg/yr)	not used	5.400E+00	-
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
R018	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
R018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	not used	1.000E+00	-
R018	Contamination fraction of irrigation water	not used	1.000E+00	-
R018	Contamination fraction of aquatic food	not used	5.000E-01	-
R018	Contamination fraction of plant food	not used	-1	-
R018	Contamination fraction of meat	not used	-1	-
R018	Contamination fraction of milk	not used	-1	-
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
R019	Livestock soil intake (kg/day)	not used	5.000E-01	-
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
021	Diffusion coefficient for radon gas (m/sec):			
021	in cover material	not used	2.000E-06	-
21	in foundation material	3.000E-07	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
021	Average building air exchange rate (1/hr)	1.000E+00	5.000E-01	-
21	Height of the building (room) (m)	2.500E+00	2.500E+00	-
021	Building interior area factor	0.000E+00	0.000E+00	code computed
021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
21	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	167.00 square meters	U-234	8.500E-02
Thickness:	1.30 meters	U-235	1.400E-02
Cover Depth:	0.00 meters	U-238	9.010E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 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	1.00
TDOSE(t):	2.171E-02	2.171E-02	2.171E-02	2.171E-02	2.172E-02	2.174E-02	2.188E-02	2.28
M(t):	7.238E-04	7.238E-04	7.238E-04	7.238E-04	7.239E-04	7.246E-04	7.293E-04	7.62

Maximum TDOSE(t): 2.286E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	5.233E-06	0.0002	1.725E-04	0.0079	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	1.589E-03	0.0732	2.647E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.791E-02	0.8247	1.635E-03	0.0753	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.950E-02	0.8981	1.833E-03	0.0844	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.234E-06	0.0002	1.725E-04	0.0079	1.338E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.589E-03	0.0732	2.648E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.791E-02	0.8247	1.635E-03	0.0753	1.532E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.950E-02	0.8981	1.834E-03	0.0844	1.338E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	5.236E-06	0.0002	1.725E-04	0.0079	1.204E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	1.589E-03	0.0732	2.650E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.791E-02	0.8247	1.635E-03	0.0753	3.630E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.950E-02	0.8981	1.834E-03	0.0844	1.204E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.261E-06	0.0002	1.725E-04	0.0079	1.336E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.589E-03	0.0732	2.658E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.791E-02	0.8247	1.635E-03	0.0753	1.339E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.950E-02	0.8981	1.834E-03	0.0844	1.336E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.477E-06	0.0003	1.726E-04	0.0079	1.197E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.590E-03	0.0732	2.697E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.791E-02	0.8246	1.635E-03	0.0753	3.601E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.950E-02	0.8980	1.834E-03	0.0845	1.197E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	7.888E-06	0.0004	1.728E-04	0.0079	1.309E-05	0.0006	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.595E-03	0.0734	2.919E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.790E-02	0.8237	1.635E-03	0.0752	1.316E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.951E-02	0.8974	1.837E-03	0.0845	1.310E-05	0.0006	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
ıclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	2.837E-05	0.0013	1.734E-04	0.0079	1.120E-04	0.0051	0.000E+00	0.0000	0.000E+00	0.0000
-235	1.614E-03	0.0738	3.639E-05	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	1.790E-02	0.8180	1.635E-03	0.0747	3.402E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.954E-02	0.8931	1.845E-03	0.0843	1.123E-04	0.0051	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

ɜum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	2.352E-04	0.0103	1.755E-04	0.0077	8.051E-04	0.0352	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.683E-03	0.0736	6.144E-05	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.787E-02	0.7815	1.636E-03	0.0716	8.354E-06	0.0004	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.978E-02	0.8654	1.873E-03	0.0819	8.134E-04	0.0356	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*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	3.000E+01	1.000E+02	3.000E+
J-234	U-234	1.000E+00	2.488E-03	2.488E-03	2.488E-03	2.488E-03	2.487E-03	2.486E-03	2.484E-
-234	Th-230	1.000E+00	0.000E+00	5.368E-08	1.610E-07	5.368E-07	1.610E-06	5.365E-06	1.607E-
-234	Ra-226	1.000E+00	0.000E+00	1.890E-08	1.701E-07	1.887E-06	1.691E-05	1.851E-04	1.589E-
J-234	Pb-210	1.000E+00	0.000E+00	2.299E-13	6.111E-12	2.145E-10	5.015E-09	1.224E-07	1.562E-
J-234	∑DSR(j)		2.488E-03	2.488E-03	2.488E-03	2.490E-03	2.506E-03	2.677E-03	4.091E-
J-235	U-235	1.000E+00	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-
J-235	Pa-231	1.000E+00	0.000E+00	1.332E-06	3.997E-06	1.332E-05	3.996E-05	1.331E-04	3.982E-
-235	Ac-227	1.000E+00	0.000E+00	1.400E-07	1.233E-06	1.275E-05	9.483E-05	6.204E-04	2.378E-
-235	∑DSR(j)		1.157E-01	1.157E-01	1.157E-01	1.158E-01	1.159E-01	1.165E-01	1.184E-
-238	U-238	1.000E+00	2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.206E-02	2.205E-
-238	U-234	1.000E+00	0.000E+00	7.052E-09	2.116E-08	7.052E-08	2.116E-07	7.050E-07	2.113E-
J-238	Th-230	1.000E+00	0.000E+00	7.609E-14	6.849E-13	7.609E-12	6.848E-11	7.605E-10	6.837E-
J-238	Ra-226	1.000E+00	0.000E+00	2.041E-14	4.837E-13	1.784E-11	4.800E-10	1.756E-08	4.555E-
-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	9.680E-18	1.541E-15	1.113E-13	9.732E-12	4.093E-
J-238	∑DSR(j)		2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.206E-02	2.206E-

Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
e 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 = 30 mrem/yr

uclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
-234	1.206E+04	1.206E+04	1.206E+04	1.205E+04	1.197E+04	1.121E+04	7.333E+03
-235	2.592E+02	2.592E+02	2.592E+02	2.591E+02	2.589E+02	2.576E+02	2.533E+02
U-238	1.359E+03	1.359E+03	1.359E+03	1.359E+03	1.360E+03	1.360E+03	1.360E+03

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 = 1.000E+03 years

uclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
-234	8.500E-02	1.000E+03	1.472E-02	2.037E+03	1.472E-02	2.037E+03
J-235	1.400E-02	1.000E+03	1.257E-01	2.387E+02	1.257E-01	2.387E+02
J-238	9.010E-01	0.000E+00	2.207E-02	1.359E+03	2.203E-02	1.362E+03

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+
U-234	U-234	1.000E+00	2.115E-04	2.115E-04	2.114E-04	2.114E-04	2.114E-04	2.113E-04	2.111E-
U-234	U-238	1.000E+00	0.000E+00	6.354E-09	1.906E-08	6.354E-08	1.906E-07	6.352E-07	1.904E-
U-234	∑DOSE(j):		2.115E-04	2.115E-04	2.115E-04	2.115E-04	2.116E-04	2.120E-04	2.130E-
Th-230	U-234	1.000E+00	0.000E+00	4.563E-09	1.369E-08	4.563E-08	1.369E-07	4.560E-07	1.366E-
Th-230	U-238	1.000E+00	0.000E+00	6.856E-14	6.171E-13	6.856E-12	6.170E-11	6.853E-10	6.161E-
Th-230	∑DOSE(j):		0.000E+00	4.563E-09	1.369E-08	4.563E-08	1.369E-07	4.567E-07	1.372E-
Ra-226	U-234	1.000E+00	0.000E+00	1.607E-09	1.446E-08	1.604E-07	1.438E-06	1.574E-05	1.351E-
Ra-226	U-238	1.000E+00	0.000E+00	1.839E-14	4.358E-13	1.607E-11	4.325E-10	1.582E-08	4.104E-
Ra-226	∑DOSE(j):		0.000E+00	1.607E-09	1.446E-08	1.604E-07	1.438E-06	1.575E-05	1.355E-
Pb-210	U-234	1.000E+00	0.000E+00	1.954E-14	5.195E-13	1.824E-11	4.263E-10	1.041E-08	1.328E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	8.722E-18	1.389E-15	1.003E-13	8.769E-12	3.688E-
Pb-210	∑DOSE(j):		0.000E+00	1.954E-14	5.195E-13	1.824E-11	4.264E-10	1.042E-08	1.332E-
U-235	U-235	1.000E+00	1.620E-03	1.620E-03	1.620E-03	1.620E-03	1.620E-03	1.620E-03	1.619E-
Pa-231	U-235	1.000E+00	0.000E+00	1.865E-08	5.596E-08	1.865E-07	5.594E-07	1.863E-06	5.575E-
Ac-227	U-235	1.000E+00	0.000E+00	1.959E-09	1.727E-08	1.786E-07	1.328E-06	8.685E-06	3.329E-
U-238	U-238	1.000E+00	1.988E-02	1.988E-02	1.988E-02	1.988E-02	1.988E-02	1.988E-02	1.987E-

BRF(i) is the branch fraction of the parent nuclide.

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+
U-234	U-234	1.000E+00	8.500E-02	8.500E-02	8.500E-02	8.500E-02	8.499E-02	8.496E-02	8.487E-
U-234	U-238	1.000E+00	0.000E+00	2.554E-06	7.663E-06	2.554E-05	7.662E-05	2.553E-04	7.655E-
U-234	∑S(j):		8.500E-02	8.500E-02	8.501E-02	8.502E-02	8.506E-02	8.521E-02	8.564E-
Th-230	U-234	1.000E+00	0.000E+00	7.652E-07	2.295E-06	7.651E-06	2.295E-05	7.646E-05	2.291E-
Th-230	U-238	1.000E+00	0.000E+00	1.150E-11	1.035E-10	1.150E-09	1.035E-08	1.149E-07	1.033E-
Th-230	∑S(j):		0.000E+00	7.652E-07	2.296E-06	7.652E-06	2.296E-05	7.658E-05	2.301E-
Ra-226	U-234	1.000E+00	0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.633E-06	1.427E-
Ra-226	U-238	1.000E+00	0.000E+00	1.897E-15	4.495E-14	1.659E-12	4.467E-11	1.642E-09	4.335E-
Ra-226	∑S(j):		0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.635E-06	1.431E-
Pb-210	U-234	1.000E+00	0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.073E-07	1.158E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	7.604E-16	1.211E-13	8.743E-12	7.645E-10	3.215E-
Pb-210	∑S(j):		0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.081E-07	1.161E-
U-235	U-235	1.000E+00	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.399E-
Th-231	U-235	1.000E+00	0.000E+00	2.962E-07	8.886E-07	2.962E-06	8.883E-06	2.958E-05	8.852E-
Ac-227	U-235	1.000E+00	0.000E+00	4.665E-09	4.111E-08	4.252E-07	3.161E-06	2.068E-05	7.927E-
U-238	U-238	1.000E+00	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.009E-01	9.008E-01	9.004E-

BRF(i) is the branch fraction of the parent nuclide.

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
D-5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
D-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
D-5				
5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIO
5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
5	U-238+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	2.560E+02	1.000E+04	
R011	Thickness of contaminated zone (m)	3.200E+00	2.000E+00	
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	
R011	Times for calculations (yr)	1.000E+00	1.000E+00	
R011	Times for calculations (yr)	3.000E+00	3.000E+00	
R011	Times for calculations (yr)	1.000E+01	1.000E+01	
R011	Times for calculations (yr)	3.000E+01	3.000E+01	
R011	Times for calculations (yr)	1.000E+02	1.000E+02	
R011	Times for calculations (yr)	3.000E+02	3.000E+02	
R011	Times for calculations (yr)	1.000E+03	1.000E+03	
R011	Times for calculations (yr)	not used	0.000E+00	
R011	Times for calculations (yr)	not used	0.000E+00	
R012	Initial principal radionuclide (pCi/g): U-234	8.500E-02	0.000E+00	
R012	Initial principal radionuclide (pCi/g): U-235	1.400E-02	0.000E+00	
R012	Initial principal radionuclide (pCi/g): U-238	9.010E-01	0.000E+00	
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	
R013	Cover depth (m)	0.000E+00	0.000E+00	
R013	Density of cover material (g/cm**3)	not used	1.500E+00	
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	
R013	Humidity in air (g/m**3)	not used	8.000E+00	
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	
R013	Irrigation mode	overhead	overhead	
R013	Runoff coefficient	5.200E-01	2.000E-01	
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	
R014	Saturated zone total porosity	3.000E-01	4.000E-01	
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	
R014	Saturated zone b parameter	4.050E+00	5.300E+00	
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
15	Number of unsaturated zone strata	2	1	-
R015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
R015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
R016	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
16	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
16	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for daughter Ac-227			
16	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
16	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.24
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.49
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.42
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.5
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	1.490E+04	8.400E+03	
R017	Mass loading for inhalation (g/m**3)	9.000E-05	1.000E-04	
R017	Exposure duration	2.500E+01	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	
R017	Fraction of time spent indoors	1.840E-01	5.000E-01	
R017	Fraction of time spent outdoors (on site)	4.600E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
17	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
17	Outer annular radius (m), ring 2:	not used	7.071E+01	-
17	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
17	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
17	Outer annular radius (m), ring 9:	not used	0.000E+00	-
17	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
17	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
R017	Ring 1	not used	1.000E+00	-
17	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
17	Ring 5	not used	0.000E+00	-
17	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
R017	Ring 8	not used	0.000E+00	-
17	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
17	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
18	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
18	Milk consumption (L/yr)	not used	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
R018	Fish consumption (kg/yr)	not used	5.400E+00	-
18	Other seafood consumption (kg/yr)	not used	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
018	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	not used	1.000E+00	-
018	Contamination fraction of irrigation water	not used	1.000E+00	-
018	Contamination fraction of aquatic food	not used	5.000E-01	-
R018	Contamination fraction of plant food	not used	-1	-
R018	Contamination fraction of meat	not used	-1	-
018	Contamination fraction of milk	not used	-1	-
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
019	Livestock soil intake (kg/day)	not used	5.000E-01	-
019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R021	Diffusion coefficient for radon gas (m/sec):			
R021	in cover material	not used	2.000E-06	-
21	in foundation material	3.000E-07	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
21	Average building air exchange rate (1/hr)	1.000E+00	5.000E-01	-
21	Height of the building (room) (m)	2.500E+00	2.500E+00	-
R021	Building interior area factor	0.000E+00	0.000E+00	code computed
R021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
21	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	256.00 square meters
Thickness:	3.20 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
U-234	8.500E-02
U-235	1.400E-02
U-238	9.010E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 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	1.00
TDOSE(t):	2.253E-02	2.253E-02	2.253E-02	2.254E-02	2.254E-02	2.256E-02	2.272E-02	2.41
M(t):	7.512E-04	7.512E-04	7.512E-04	7.512E-04	7.513E-04	7.521E-04	7.572E-04	8.04

Maximum TDOSE(t): 2.412E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.346E-06	0.0002	1.805E-04	0.0080	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.628E-03	0.0722	2.771E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.840E-02	0.8166	1.711E-03	0.0759	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.004E-02	0.8891	1.919E-03	0.0852	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
U-234	5.347E-06	0.0002	1.805E-04	0.0080	1.381E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.628E-03	0.0722	2.771E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.840E-02	0.8166	1.711E-03	0.0759	1.412E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.004E-02	0.8891	1.919E-03	0.0852	1.381E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
iclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.349E-06	0.0002	1.805E-04	0.0080	1.242E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	1.628E-03	0.0722	2.773E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.840E-02	0.8166	1.711E-03	0.0759	3.745E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.004E-02	0.8891	1.919E-03	0.0852	1.242E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

;um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.375E-06	0.0002	1.806E-04	0.0080	1.379E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.628E-03	0.0722	2.781E-05	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.840E-02	0.8166	1.711E-03	0.0759	1.382E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.004E-02	0.8891	1.919E-03	0.0852	1.379E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	5.597E-06	0.0002	1.806E-04	0.0080	1.237E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000
235	1.629E-03	0.0723	2.823E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.840E-02	0.8165	1.711E-03	0.0759	3.722E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
otal	2.004E-02	0.8890	1.920E-03	0.0852	1.238E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	8.078E-06	0.0004	1.809E-04	0.0080	1.360E-05	0.0006	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.635E-03	0.0725	3.055E-05	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.840E-02	0.8156	1.711E-03	0.0758	1.368E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.004E-02	0.8884	1.922E-03	0.0852	1.362E-05	0.0006	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	2.915E-05	0.0013	1.815E-04	0.0080	1.188E-04	0.0052	0.000E+00	0.0000	0.000E+00	0.0000
235	1.654E-03	0.0728	3.810E-05	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.840E-02	0.8098	1.712E-03	0.0754	3.610E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.008E-02	0.8839	1.931E-03	0.0850	1.192E-04	0.0052	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
U-234	2.445E-04	0.0101	1.839E-04	0.0076	1.191E-03	0.0494	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.721E-03	0.0714	6.439E-05	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.839E-02	0.7623	1.715E-03	0.0711	1.236E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.035E-02	0.8438	1.963E-03	0.0814	1.203E-03	0.0499	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	2.795E-03	2.795E-03	2.795E-03	2.795E-03	2.795E-03	2.794E-03	2.792E-
234	Th-230	1.000E+00	0.000E+00	5.951E-08	1.785E-07	5.951E-07	1.785E-06	5.947E-06	1.782E-
234	Ra-226	1.000E+00	0.000E+00	1.950E-08	1.754E-07	1.947E-06	1.747E-05	1.921E-04	1.678E-
U-234	Pb-210	1.000E+00	0.000E+00	3.395E-13	9.026E-12	3.168E-10	7.407E-09	1.808E-07	2.308E-
234	∑DSR(j)		2.795E-03	2.795E-03	2.795E-03	2.797E-03	2.814E-03	2.992E-03	4.490E-
U-235	U-235	1.000E+00	1.188E-01	1.188E-01	1.188E-01	1.188E-01	1.188E-01	1.188E-01	1.188E-
U-235	Pa-231	1.000E+00	0.000E+00	1.535E-06	4.604E-06	1.534E-05	4.602E-05	1.533E-04	4.588E-
235	Ac-227	1.000E+00	0.000E+00	1.478E-07	1.303E-06	1.347E-05	1.002E-04	6.554E-04	2.513E-
235	∑DSR(j)		1.188E-01	1.188E-01	1.188E-01	1.189E-01	1.190E-01	1.196E-01	1.218E-
238	U-238	1.000E+00	2.290E-02	2.290E-02	2.290E-02	2.290E-02	2.290E-02	2.290E-02	2.289E-
238	U-234	1.000E+00	0.000E+00	7.924E-09	2.377E-08	7.923E-08	2.377E-07	7.922E-07	2.375E-
U-238	Th-230	1.000E+00	0.000E+00	8.436E-14	7.592E-13	8.435E-12	7.591E-11	8.432E-10	7.582E-
238	Ra-226	1.000E+00	0.000E+00	1.881E-14	4.988E-13	1.841E-11	4.958E-10	1.822E-08	4.809E-
238	Pb-210	1.000E+00	0.000E+00	4.134E-19	1.677E-17	2.281E-15	1.644E-13	1.437E-11	6.047E-
U-238	∑DSR(j)		2.290E-02	2.290E-02	2.290E-02	2.290E-02	2.290E-02	2.290E-02	2.290E-

ranch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
e 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 = 30 mrem/yr

clide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
234	1.073E+04	1.073E+04	1.073E+04	1.072E+04	1.066E+04	1.003E+04	6.682E+03
235	2.524E+02	2.524E+02	2.524E+02	2.524E+02	2.521E+02	2.508E+02	2.464E+02
U-238	1.310E+03	1.310E+03	1.310E+03	1.310E+03	1.310E+03	1.310E+03	1.310E+03

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 = 1.000E+03 years

clide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
-234	8.500E-02	1.000E+03	1.970E-02	1.523E+03	1.970E-02	1.523E+03
U-235	1.400E-02	1.000E+03	1.292E-01	2.321E+02	1.292E-01	2.321E+02
U-238	9.010E-01	1.000E+03	2.290E-02	1.310E+03	2.290E-02	1.310E+03

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-
U-234	U-234	1.000E+00	2.376E-04	2.376E-04	2.376E-04	2.376E-04	2.375E-04	2.375E-04	2.373E-
U-234	U-238	1.000E+00	0.000E+00	7.139E-09	2.142E-08	7.139E-08	2.142E-07	7.138E-07	2.140E-
U-234	∑DOSE(j):		2.376E-04	2.376E-04	2.376E-04	2.376E-04	2.378E-04	2.382E-04	2.394E-
Th-230	U-234	1.000E+00	0.000E+00	5.058E-09	1.518E-08	5.058E-08	1.517E-07	5.055E-07	1.515E-
Th-230	U-238	1.000E+00	0.000E+00	7.600E-14	6.840E-13	7.600E-12	6.839E-11	7.597E-10	6.831E-
Th-230	∑DOSE(j):		0.000E+00	5.058E-09	1.518E-08	5.059E-08	1.518E-07	5.063E-07	1.521E-
Ra-226	U-234	1.000E+00	0.000E+00	1.657E-09	1.491E-08	1.655E-07	1.485E-06	1.633E-05	1.426E-
Ra-226	U-238	1.000E+00	0.000E+00	1.695E-14	4.494E-13	1.658E-11	4.467E-10	1.642E-08	4.333E-
Ra-226	∑DOSE(j):		0.000E+00	1.657E-09	1.491E-08	1.655E-07	1.485E-06	1.634E-05	1.431E-
Pb-210	U-234	1.000E+00	0.000E+00	2.886E-14	7.672E-13	2.693E-11	6.296E-10	1.537E-08	1.962E-
Pb-210	U-238	1.000E+00	0.000E+00	3.725E-19	1.511E-17	2.055E-15	1.481E-13	1.295E-11	5.448E-
Pb-210	∑DOSE(j):		0.000E+00	2.886E-14	7.672E-13	2.693E-11	6.297E-10	1.538E-08	1.967E-
U-235	U-235	1.000E+00	1.664E-03	1.664E-03	1.664E-03	1.664E-03	1.664E-03	1.664E-03	1.663E-
Pa-231	U-235	1.000E+00	0.000E+00	2.148E-08	6.445E-08	2.148E-07	6.443E-07	2.146E-06	6.423E-
Ac-227	U-235	1.000E+00	0.000E+00	2.070E-09	1.824E-08	1.886E-07	1.403E-06	9.176E-06	3.518E-
U-238	U-238	1.000E+00	2.063E-02	2.063E-02	2.063E-02	2.063E-02	2.063E-02	2.063E-02	2.063E-

BRF(i) is the branch fraction of the parent nuclide.

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+
I-234	U-234	1.000E+00	8.500E-02	8.500E-02	8.500E-02	8.500E-02	8.499E-02	8.497E-02	8.490E-
234	U-238	1.000E+00	0.000E+00	2.554E-06	7.663E-06	2.554E-05	7.662E-05	2.554E-04	7.658E-
234	∑S(j):		8.500E-02	8.500E-02	8.501E-02	8.502E-02	8.507E-02	8.522E-02	8.567E-
-230	U-234	1.000E+00	0.000E+00	7.652E-07	2.295E-06	7.651E-06	2.295E-05	7.647E-05	2.291E-
-230	U-238	1.000E+00	0.000E+00	1.150E-11	1.035E-10	1.150E-09	1.035E-08	1.149E-07	1.033E-
h-230	∑S(j):		0.000E+00	7.652E-07	2.296E-06	7.652E-06	2.296E-05	7.658E-05	2.301E-
-226	U-234	1.000E+00	0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.633E-06	1.427E-
a-226	U-238	1.000E+00	0.000E+00	1.695E-15	4.494E-14	1.658E-12	4.468E-11	1.642E-09	4.336E-
a-226	∑S(j):		0.000E+00	1.657E-10	1.491E-09	1.655E-08	1.485E-07	1.635E-06	1.431E-
-210	U-234	1.000E+00	0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.717E-08	9.074E-07	1.158E-
b-210	U-238	1.000E+00	0.000E+00	2.199E-17	8.920E-16	1.213E-13	8.743E-12	7.646E-10	3.216E-
-210	∑S(j):		0.000E+00	1.704E-12	4.529E-11	1.590E-09	3.718E-08	9.081E-07	1.161E-
-235	U-235	1.000E+00	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-02	1.400E-
-231	U-235	1.000E+00	0.000E+00	2.962E-07	8.886E-07	2.962E-06	8.883E-06	2.959E-05	8.856E-
c-227	U-235	1.000E+00	0.000E+00	4.665E-09	4.112E-08	4.252E-07	3.161E-06	2.068E-05	7.931E-
238	U-238	1.000E+00	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.010E-01	9.009E-01	9.008E-

BRF(i) is the branch fraction of the parent nuclide.

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DC
B-1	Pa-231	1.280E+00	1.280E+00	DC
B-1	Pb-210+D	2.320E-02	2.320E-02	DC
B-1	Ra-226+D	8.600E-03	8.600E-03	DC
B-1	Th-230	3.260E-01	3.260E-01	DC
B-1	U-234	1.320E-01	1.320E-01	DC
B-1	U-235+D	1.230E-01	1.230E-01	DC
B-1	U-238+D	1.180E-01	1.180E-01	DC
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DC
D-1	Pa-231	1.060E-02	1.060E-02	DC
D-1	Pb-210+D	7.270E-03	7.270E-03	DC
D-1	Ra-226+D	1.330E-03	1.330E-03	DC
D-1	Th-230	5.480E-04	5.480E-04	DC
D-1	U-234	2.830E-04	2.830E-04	DC
D-1	U-235+D	2.670E-04	2.670E-04	DC
D-1	U-238+D	2.690E-04	2.690E-04	DC
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RT
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RT
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RT
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RT
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RT
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RT
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RT
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RT
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RT
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RT
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RT
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RT
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RT
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RT
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RT
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RT
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RT
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RT
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

:nu	Parameter	Current Value	Default	Pa
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
·34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
·34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
·5	Bioaccumulation factors, fresh water, L/kg:			
·5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
D-5				
·5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
D-5				
·5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
·5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
D-5				
·5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
·5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
·5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIO
·5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
·5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
·5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.210E+03	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	5.070E-01	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	2.300E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	4.700E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
015	Number of unsaturated zone strata	2	1	-
R015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
016	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Ac-227			
016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.1
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	1.490E+04	8.400E+03	
R017	Mass loading for inhalation (g/m**3)	9.000E-05	1.000E-04	
R017	Exposure duration	2.500E+01	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	-
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	
R017	Fraction of time spent indoors	1.840E-01	5.000E-01	
R017	Fraction of time spent outdoors (on site)	4.600E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	-
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
R017	Ring 1	not used	1.000E+00	-
R017	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
R017	Ring 5	not used	0.000E+00	-
R017	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
R017	Ring 8	not used	0.000E+00	-
R017	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
R017	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
R018	Milk consumption (L/yr)	not used	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
R018	Fish consumption (kg/yr)	not used	5.400E+00	-
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
R018	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
R018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	not used	1.000E+00	-
R018	Contamination fraction of irrigation water	not used	1.000E+00	-
R018	Contamination fraction of aquatic food	not used	5.000E-01	-
R018	Contamination fraction of plant food	not used	-1	-
R018	Contamination fraction of meat	not used	-1	-
R018	Contamination fraction of milk	not used	-1	-
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
R019	Livestock soil intake (kg/day)	not used	5.000E-01	-
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	-

Site-Specific Parameter Summary (continued)

nu	Parameter	User Input	Default	Used b (If different
R021	Diffusion coefficient for radon gas (m/sec):			
R021	in cover material	not used	2.000E-06	-
21	in foundation material	3.000E-07	3.000E-07	-
N021	in contaminated zone soil	2.000E-06	2.000E-06	-
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
21	Average building air exchange rate (1/hr)	1.000E+00	5.000E-01	-
21	Height of the building (room) (m)	2.500E+00	2.500E+00	-
R021	Building interior area factor	0.000E+00	0.000E+00	code computed
021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
R021	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1210.00 square meters	U-234	5.070E-01
Thickness:	1.30 meters	U-235	2.300E-02
Cover Depth:	0.00 meters	U-238	4.700E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 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	1.00
TDOSE(t):	1.766E-02	1.766E-02	1.766E-02	1.766E-02	1.767E-02	1.778E-02	1.858E-02	2.46
M(t):	5.885E-04	5.885E-04	5.885E-04	5.886E-04	5.890E-04	5.926E-04	6.194E-04	8.20

Maximum TDOSE(t): 2.461E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	3.317E-05	0.0019	1.269E-03	0.0719	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
235	2.791E-03	0.1581	5.364E-05	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.014E-02	0.5743	1.052E-03	0.0596	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.296E-02	0.7343	2.374E-03	0.1345	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.317E-05	0.0019	1.269E-03	0.0719	8.030E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.791E-03	0.1581	5.366E-05	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.014E-02	0.5743	1.052E-03	0.0596	8.039E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.296E-02	0.7343	2.374E-03	0.1345	8.030E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
iclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.319E-05	0.0019	1.269E-03	0.0719	7.224E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	2.791E-03	0.1581	5.369E-05	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	1.014E-02	0.5743	1.052E-03	0.0596	1.905E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.296E-02	0.7342	2.374E-03	0.1345	7.224E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
U-234	3.335E-05	0.0019	1.269E-03	0.0719	8.015E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.791E-03	0.1581	5.385E-05	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.014E-02	0.5742	1.052E-03	0.0596	7.024E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.296E-02	0.7342	2.375E-03	0.1345	8.015E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.475E-05	0.0020	1.270E-03	0.0719	7.182E-06	0.0004	0.000E+00	0.0000	0.000E+00	0.0000
235	2.793E-03	0.1581	5.465E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.014E-02	0.5738	1.052E-03	0.0595	1.889E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.297E-02	0.7338	2.376E-03	0.1345	7.182E-06	0.0004	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.040E-05	0.0028	1.271E-03	0.0715	7.854E-05	0.0044	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.803E-03	0.1576	5.914E-05	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.014E-02	0.5702	1.052E-03	0.0592	6.905E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.299E-02	0.7307	2.382E-03	0.1340	7.855E-05	0.0044	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	1.834E-04	0.0099	1.276E-03	0.0687	6.716E-04	0.0361	0.000E+00	0.0000	0.000E+00	0.0000
235	2.835E-03	0.1526	7.373E-05	0.0040	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	1.013E-02	0.5453	1.052E-03	0.0566	1.784E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.315E-02	0.7078	2.401E-03	0.1292	6.718E-04	0.0362	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.554E-03	0.0631	1.291E-03	0.0525	4.816E-03	0.1957	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.006E-03	0.1222	1.245E-04	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.027E-02	0.4172	1.053E-03	0.0428	4.370E-06	0.0002	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.483E-02	0.6025	2.468E-03	0.1003	4.821E-03	0.1959	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
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
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
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
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

*Sum of all water independent and dependent pathways.

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
)-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
)-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
)-5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
)-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
)-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
)-5				
5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
)-5				
)-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
5				
)-5	U-234 , fish	1.000E+01	1.000E+01	BIO
5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
)-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
)-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	2.560E+02	1.000E+04	
R011	Thickness of contaminated zone (m)	3.200E+00	2.000E+00	
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	
R011	Times for calculations (yr)	1.000E+00	1.000E+00	
R011	Times for calculations (yr)	3.000E+00	3.000E+00	
R011	Times for calculations (yr)	1.000E+01	1.000E+01	
R011	Times for calculations (yr)	3.000E+01	3.000E+01	
R011	Times for calculations (yr)	1.000E+02	1.000E+02	
R011	Times for calculations (yr)	3.000E+02	3.000E+02	
R011	Times for calculations (yr)	1.000E+03	1.000E+03	
R011	Times for calculations (yr)	not used	0.000E+00	
R011	Times for calculations (yr)	not used	0.000E+00	
R012	Initial principal radionuclide (pCi/g): U-234	5.070E-01	0.000E+00	
R012	Initial principal radionuclide (pCi/g): U-235	2.300E-02	0.000E+00	
R012	Initial principal radionuclide (pCi/g): U-238	4.700E-01	0.000E+00	
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	
R013	Cover depth (m)	0.000E+00	0.000E+00	
R013	Density of cover material (g/cm**3)	not used	1.500E+00	
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	
R013	Humidity in air (g/m**3)	not used	8.000E+00	
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	
R013	Irrigation mode	overhead	overhead	
R013	Runoff coefficient	5.200E-01	2.000E-01	
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	
R014	Saturated zone total porosity	3.000E-01	4.000E-01	
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	
R014	Saturated zone b parameter	4.050E+00	5.300E+00	
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R015	Number of unsaturated zone strata	2	1	-
R015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
R015	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
16	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
16	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
R016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Ac-227			
016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.24
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.98
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.49
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.42
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.5
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	1.490E+04	8.400E+03	
R017	Mass loading for inhalation (g/m**3)	9.000E-05	1.000E-04	
R017	Exposure duration	2.500E+01	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	
R017	Fraction of time spent indoors	1.840E-01	5.000E-01	
R017	Fraction of time spent outdoors (on site)	4.600E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	-
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
R017	Ring 1	not used	1.000E+00	-
R017	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
R017	Ring 5	not used	0.000E+00	-
R017	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
R017	Ring 8	not used	0.000E+00	-
R017	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
R017	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
R018	Milk consumption (L/yr)	not used	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
R018	Fish consumption (kg/yr)	not used	5.400E+00	-
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
R018	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
R018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	not used	1.000E+00	-
R018	Contamination fraction of irrigation water	not used	1.000E+00	-
R018	Contamination fraction of aquatic food	not used	5.000E-01	-
R018	Contamination fraction of plant food	not used	-1	-
R018	Contamination fraction of meat	not used	-1	-
R018	Contamination fraction of milk	not used	-1	-
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
R019	Livestock soil intake (kg/day)	not used	5.000E-01	-
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
021	Diffusion coefficient for radon gas (m/sec):			
021	in cover material	not used	2.000E-06	-
21	in foundation material	3.000E-07	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
021	Average building air exchange rate (1/hr)	1.000E+00	5.000E-01	-
21	Height of the building (room) (m)	2.500E+00	2.500E+00	-
021	Building interior area factor	0.000E+00	0.000E+00	code computed
021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
21	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	256.00 square meters
Thickness:	3.20 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
U-234	5.070E-01
U-235	2.300E-02
U-238	4.700E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 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	1.00
TDOSE(t):	1.491E-02	1.491E-02	1.491E-02	1.492E-02	1.493E-02	1.503E-02	1.584E-02	2.37
M(t):	4.971E-04	4.971E-04	4.971E-04	4.972E-04	4.975E-04	5.010E-04	5.280E-04	7.90

Maximum TDOSE(t): 2.373E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.189E-05	0.0021	1.077E-03	0.0722	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.674E-03	0.1793	4.552E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	9.599E-03	0.6437	8.924E-04	0.0598	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.231E-02	0.8251	2.015E-03	0.1351	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.189E-05	0.0021	1.077E-03	0.0722	8.236E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.675E-03	0.1793	4.553E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.599E-03	0.6437	8.924E-04	0.0598	7.368E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.231E-02	0.8251	2.015E-03	0.1351	8.236E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.191E-05	0.0021	1.077E-03	0.0722	7.410E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.675E-03	0.1793	4.556E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	9.599E-03	0.6436	8.924E-04	0.0598	1.953E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.231E-02	0.8251	2.015E-03	0.1351	7.410E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.206E-05	0.0021	1.077E-03	0.0722	8.225E-07	0.0001	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.675E-03	0.1793	4.569E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.599E-03	0.6436	8.924E-04	0.0598	7.208E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.231E-02	0.8251	2.015E-03	0.1351	8.225E-07	0.0001	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
nclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	3.339E-05	0.0022	1.077E-03	0.0722	7.380E-06	0.0005	0.000E+00	0.0000	0.000E+00	0.0000
-235	2.676E-03	0.1793	4.638E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	9.599E-03	0.6431	8.924E-04	0.0598	1.942E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.231E-02	0.8246	2.016E-03	0.1351	7.380E-06	0.0005	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
J-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
-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
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

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	4.818E-05	0.0032	1.079E-03	0.0718	8.115E-05	0.0054	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.686E-03	0.1787	5.019E-05	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.598E-03	0.6386	8.926E-04	0.0594	7.135E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.233E-02	0.8205	2.022E-03	0.1345	8.116E-05	0.0054	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.739E-04	0.0110	1.083E-03	0.0684	7.088E-04	0.0447	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.718E-03	0.1716	6.259E-05	0.0040	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	9.597E-03	0.6059	8.930E-04	0.0564	1.883E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.249E-02	0.7884	2.038E-03	0.1287	7.089E-04	0.0448	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-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
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
-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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.459E-03	0.0615	1.097E-03	0.0462	7.104E-03	0.2994	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.828E-03	0.1192	1.058E-04	0.0045	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.592E-03	0.4043	8.944E-04	0.0377	6.448E-06	0.0003	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.388E-02	0.5850	2.097E-03	0.0884	7.111E-03	0.2997	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

NU = natural uranium

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Pa
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF
B-1	Pa-231	1.280E+00	1.280E+00	DCF
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF
B-1	Th-230	3.260E-01	3.260E-01	DCF
B-1	U-234	1.320E-01	1.320E-01	DCF
B-1	U-235+D	1.230E-01	1.230E-01	DCF
B-1	U-238+D	1.180E-01	1.180E-01	DCF
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF
D-1	Pa-231	1.060E-02	1.060E-02	DCF
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF
D-1	Th-230	5.480E-04	5.480E-04	DCF
D-1	U-234	2.830E-04	2.830E-04	DCF
D-1	U-235+D	2.670E-04	2.670E-04	DCF
D-1	U-238+D	2.690E-04	2.690E-04	DCF
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

nu	Parameter	Current Value	Default	Pa
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-5	Bioaccumulation factors, fresh water, L/kg:			
5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
D-5				
5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
D-5				
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIO
5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
5				
5	U-238+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used b (If different
R011	Area of contaminated zone (m**2)	1.670E+02	1.000E+04	-
R011	Thickness of contaminated zone (m)	1.300E+00	2.000E+00	-
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	-
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
R011	Times for calculations (yr)	1.000E+00	1.000E+00	-
R011	Times for calculations (yr)	3.000E+00	3.000E+00	-
R011	Times for calculations (yr)	1.000E+01	1.000E+01	-
R011	Times for calculations (yr)	3.000E+01	3.000E+01	-
R011	Times for calculations (yr)	1.000E+02	1.000E+02	-
R011	Times for calculations (yr)	3.000E+02	3.000E+02	-
R011	Times for calculations (yr)	1.000E+03	1.000E+03	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R011	Times for calculations (yr)	not used	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-234	5.070E-01	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-235	2.300E-02	0.000E+00	-
R012	Initial principal radionuclide (pCi/g): U-238	4.700E-01	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
R013	Cover depth (m)	0.000E+00	0.000E+00	-
R013	Density of cover material (g/cm**3)	not used	1.500E+00	-
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	-
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	-
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	-
R013	Contaminated zone hydraulic conductivity (m/yr)	4.400E+02	1.000E+01	-
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	-
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	-
R013	Humidity in air (g/m**3)	not used	8.000E+00	-
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	-
R013	Precipitation (m/yr)	4.800E-01	1.000E+00	-
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	-
R013	Irrigation mode	overhead	overhead	-
R013	Runoff coefficient	5.200E-01	2.000E-01	-
R013	Watershed area for nearby stream or pond (m**2)	2.700E+07	1.000E+06	-
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	-
R014	Saturated zone total porosity	3.000E-01	4.000E-01	-
R014	Saturated zone effective porosity	3.000E-01	2.000E-01	-
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	-
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
R014	Saturated zone b parameter	4.050E+00	5.300E+00	-
R014	Water table drop rate (m/yr)	3.000E-01	1.000E-03	-
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	-
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
015	Number of unsaturated zone strata	2	1	-
R015	Unsat. zone 1, thickness (m)	2.600E+02	4.000E+00	-
15	Unsat. zone 1, soil density (g/cm**3)	1.600E+00	1.500E+00	-
15	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 1, effective porosity	4.000E-01	2.000E-01	-
015	Unsat. zone 1, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E+00	1.000E+01	-
R015	Unsat. zone 2, thickness (m)	1.000E+02	0.000E+00	-
15	Unsat. zone 2, soil density (g/cm**3)	1.600E+00	1.500E+00	-
015	Unsat. zone 2, total porosity	5.000E-01	4.000E-01	-
R015	Unsat. zone 2, effective porosity	4.000E-01	2.000E-01	-
15	Unsat. zone 2, soil-specific b parameter	4.050E+00	5.300E+00	-
15	Unsat. zone 2, hydraulic conductivity (m/yr)	3.700E+02	1.000E+01	-
016	Distribution coefficients for U-234			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-235			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
16	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for U-238			
016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Ac-227			
016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	-
016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.52
R016	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R016	Distribution coefficients for daughter Pa-231			
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	-
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.21
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Pb-210			
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	-
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.1
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Ra-226			
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	-
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.58
R016	Solubility constant	0.000E+00	0.000E+00	not
R016	Distribution coefficients for daughter Th-230			
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Unsaturated zone 2 (cm**3/g)	6.000E+04	6.000E+04	-
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	-
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.8
R016	Solubility constant	0.000E+00	0.000E+00	not
R017	Inhalation rate (m**3/yr)	1.490E+04	8.400E+03	-
R017	Mass loading for inhalation (g/m**3)	9.000E-05	1.000E-04	-
R017	Exposure duration	2.500E+01	3.000E+01	-
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	-
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	-
R017	Fraction of time spent indoors	1.840E-01	5.000E-01	-
R017	Fraction of time spent outdoors (on site)	4.600E-02	2.500E-01	-
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows c

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R017	Radii of shape factor array (used if FS = -1):			
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	-
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	-
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	-
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	-
R017	Fractions of annular areas within AREA:			
R017	Ring 1	not used	1.000E+00	-
R017	Ring 2	not used	2.732E-01	-
R017	Ring 3	not used	0.000E+00	-
R017	Ring 4	not used	0.000E+00	-
R017	Ring 5	not used	0.000E+00	-
R017	Ring 6	not used	0.000E+00	-
R017	Ring 7	not used	0.000E+00	-
R017	Ring 8	not used	0.000E+00	-
R017	Ring 9	not used	0.000E+00	-
R017	Ring 10	not used	0.000E+00	-
R017	Ring 11	not used	0.000E+00	-
R017	Ring 12	not used	0.000E+00	-
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	-
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	-
R018	Milk consumption (L/yr)	not used	9.200E+01	-
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	-
R018	Fish consumption (kg/yr)	not used	5.400E+00	-
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	-
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
R018	Drinking water intake (L/yr)	0.000E+00	5.100E+02	-
R018	Contamination fraction of drinking water	0.000E+00	1.000E+00	-
R018	Contamination fraction of household water	0.000E+00	1.000E+00	-
R018	Contamination fraction of livestock water	not used	1.000E+00	-
R018	Contamination fraction of irrigation water	not used	1.000E+00	-
R018	Contamination fraction of aquatic food	not used	5.000E-01	-
R018	Contamination fraction of plant food	not used	-1	-
R018	Contamination fraction of meat	not used	-1	-
R018	Contamination fraction of milk	not used	-1	-
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	-
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	-
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
R019	Livestock soil intake (kg/day)	not used	5.000E-01	-
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
R019	Depth of roots (m)	not used	9.000E-01	-
R019	Drinking water fraction from ground water	0.000E+00	1.000E+00	-
R019	Household water fraction from ground water	0.000E+00	1.000E+00	-
R019	Livestock water fraction from ground water	0.000E+00	1.000E+00	-
R019	Irrigation fraction from ground water	not used	1.000E+00	-
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	-
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	-
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	-
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	-
R19B	Growing Season for Leafy (years)	not used	2.500E-01	-
R19B	Growing Season for Fodder (years)	not used	8.000E-02	-
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	-
R19B	Translocation Factor for Leafy	not used	1.000E+00	-
R19B	Translocation Factor for Fodder	not used	1.000E+00	-
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	-
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	-
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	-
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	-
C14	Fraction of vegetation carbon from air	not used	9.800E-01	-
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
C14	Fraction of grain in milk cow feed	not used	2.000E-01	-
STOR	Storage times of contaminated foodstuffs (days):			
STOR	Fruits, non-leafy vegetables, and grain	0.000E+00	1.400E+01	-
STOR	Leafy vegetables	0.000E+00	1.000E+00	-
STOR	Milk	0.000E+00	1.000E+00	-
STOR	Meat and poultry	0.000E+00	2.000E+01	-
STOR	Fish	0.000E+00	7.000E+00	-
STOR	Crustacea and mollusks	0.000E+00	7.000E+00	-
STOR	Well water	0.000E+00	1.000E+00	-
STOR	Surface water	0.000E+00	1.000E+00	-
STOR	Livestock fodder	0.000E+00	4.500E+01	-
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	-
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	-
R021	Total porosity of the cover material	not used	4.000E-01	-
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	-
R021	Volumetric water content of the cover material	not used	5.000E-02	-
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	-

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used b (If different
21	Diffusion coefficient for radon gas (m/sec):			
R021	in cover material	not used	2.000E-06	-
021	in foundation material	3.000E-07	3.000E-07	-
21	in contaminated zone soil	2.000E-06	2.000E-06	-
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	-
R021	Average building air exchange rate (1/hr)	1.000E+00	5.000E-01	-
21	Height of the building (room) (m)	2.500E+00	2.500E+00	-
R021	Building interior area factor	0.000E+00	0.000E+00	code computed
R021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	-
21	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	-
21	Emanating power of Rn-220 gas	not used	1.500E-01	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	167.00 square meters	U-234	5.070E-01
Thickness:	1.30 meters	U-235	2.300E-02
Cover Depth:	0.00 meters	U-238	4.700E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 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	1.00
TDOSE(t):	1.430E-02	1.430E-02	1.430E-02	1.430E-02	1.431E-02	1.441E-02	1.516E-02	2.07
M(t):	4.765E-04	4.765E-04	4.765E-04	4.766E-04	4.769E-04	4.802E-04	5.055E-04	6.90

Maximum TDOSE(t): 2.071E-02 mrem/yr at t = 1.000E+03 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	3.122E-05	0.0022	1.029E-03	0.0720	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
J-235	2.610E-03	0.1826	4.349E-05	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	9.342E-03	0.6535	8.526E-04	0.0596	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.198E-02	0.8383	1.925E-03	0.1347	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) an
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.122E-05	0.0022	1.029E-03	0.0720	7.983E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.610E-03	0.1826	4.350E-05	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.342E-03	0.6535	8.526E-04	0.0596	7.991E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.198E-02	0.8383	1.925E-03	0.1347	7.983E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
J-234	3.123E-05	0.0022	1.029E-03	0.0720	7.181E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
J-235	2.610E-03	0.1826	4.353E-05	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	9.342E-03	0.6535	8.526E-04	0.0596	1.893E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.198E-02	0.8383	1.925E-03	0.1347	7.181E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
J-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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.138E-05	0.0022	1.029E-03	0.0720	7.967E-07	0.0001	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.610E-03	0.1826	4.366E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.342E-03	0.6534	8.526E-04	0.0596	6.983E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.198E-02	0.8382	1.925E-03	0.1347	7.967E-07	0.0001	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.267E-05	0.0023	1.029E-03	0.0720	7.139E-06	0.0005	0.000E+00	0.0000	0.000E+00	0.0000
235	2.612E-03	0.1826	4.431E-05	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	9.341E-03	0.6529	8.527E-04	0.0596	1.878E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.199E-02	0.8378	1.926E-03	0.1346	7.139E-06	0.0005	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	4.705E-05	0.0033	1.031E-03	0.0715	7.808E-05	0.0054	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.621E-03	0.1819	4.795E-05	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.340E-03	0.6483	8.527E-04	0.0592	6.865E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.201E-02	0.8335	1.931E-03	0.1341	7.809E-05	0.0054	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.692E-04	0.0112	1.034E-03	0.0682	6.679E-04	0.0440	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.651E-03	0.1748	5.978E-05	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
238	9.336E-03	0.6156	8.529E-04	0.0562	1.775E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.216E-02	0.8016	1.947E-03	0.1284	6.681E-04	0.0441	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

um of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.403E-03	0.0677	1.047E-03	0.0505	4.802E-03	0.2319	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.764E-03	0.1335	1.009E-04	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.319E-03	0.4500	8.535E-04	0.0412	4.358E-06	0.0002	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.349E-02	0.6512	2.001E-03	0.0966	4.806E-03	0.2321	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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
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
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
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

*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	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	2.488E-03	2.488E-03	2.488E-03	2.488E-03	2.487E-03	2.486E-03	2.484E-
234	Th-230	1.000E+00	0.000E+00	5.368E-08	1.610E-07	5.368E-07	1.610E-06	5.365E-06	1.607E-
234	Ra-226	1.000E+00	0.000E+00	1.890E-08	1.701E-07	1.887E-06	1.691E-05	1.851E-04	1.589E-
U-234	Pb-210	1.000E+00	0.000E+00	2.299E-13	6.111E-12	2.145E-10	5.015E-09	1.224E-07	1.562E-
U-234	∑DSR(j)		2.488E-03	2.488E-03	2.488E-03	2.490E-03	2.506E-03	2.677E-03	4.091E-
U-235	U-235	1.000E+00	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-
U-235	Pa-231	1.000E+00	0.000E+00	1.332E-06	3.997E-06	1.332E-05	3.996E-05	1.331E-04	3.982E-
235	Ac-227	1.000E+00	0.000E+00	1.400E-07	1.233E-06	1.275E-05	9.483E-05	6.204E-04	2.378E-
235	∑DSR(j)		1.157E-01	1.157E-01	1.157E-01	1.158E-01	1.159E-01	1.165E-01	1.184E-
238	U-238	1.000E+00	2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.206E-02	2.205E-
238	U-234	1.000E+00	0.000E+00	7.052E-09	2.116E-08	7.052E-08	2.116E-07	7.050E-07	2.113E-
U-238	Th-230	1.000E+00	0.000E+00	7.609E-14	6.849E-13	7.609E-12	6.848E-11	7.605E-10	6.837E-
U-238	Ra-226	1.000E+00	0.000E+00	2.041E-14	4.837E-13	1.784E-11	4.800E-10	1.756E-08	4.555E-
238	Pb-210	1.000E+00	0.000E+00	0.000E+00	9.680E-18	1.541E-15	1.113E-13	9.732E-12	4.093E-
U-238	∑DSR(j)		2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.207E-02	2.206E-02	2.206E-

ranch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
e 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 = 30 mrem/yr

clide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
234	1.206E+04	1.206E+04	1.206E+04	1.205E+04	1.197E+04	1.121E+04	7.333E+03
235	2.592E+02	2.592E+02	2.592E+02	2.591E+02	2.589E+02	2.576E+02	2.533E+02
U-238	1.359E+03	1.359E+03	1.359E+03	1.359E+03	1.360E+03	1.360E+03	1.360E+03

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 = 1.000E+03 years

clide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
-234	5.070E-01	1.000E+03	1.472E-02	2.037E+03	1.472E-02	2.037E+03
-235	2.300E-02	1.000E+03	1.257E-01	2.387E+02	1.257E-01	2.387E+02
U-238	4.700E-01	0.000E+00	2.207E-02	1.359E+03	2.203E-02	1.362E+03

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+
U-234	U-234	1.000E+00	1.261E-03	1.261E-03	1.261E-03	1.261E-03	1.261E-03	1.261E-03	1.259E-
U-234	U-238	1.000E+00	0.000E+00	3.315E-09	9.944E-09	3.315E-08	9.943E-08	3.313E-07	9.933E-
U-234	∑DOSE(j):		1.261E-03	1.261E-03	1.261E-03	1.261E-03	1.261E-03	1.261E-03	1.260E-
Th-230	U-234	1.000E+00	0.000E+00	2.722E-08	8.165E-08	2.722E-07	8.164E-07	2.720E-06	8.148E-
Th-230	U-238	1.000E+00	0.000E+00	3.576E-14	3.219E-13	3.576E-12	3.218E-11	3.575E-10	3.214E-
Th-230	∑DOSE(j):		0.000E+00	2.722E-08	8.165E-08	2.722E-07	8.164E-07	2.720E-06	8.151E-
Ra-226	U-234	1.000E+00	0.000E+00	9.584E-09	8.622E-08	9.567E-07	8.574E-06	9.386E-05	8.059E-
Ra-226	U-238	1.000E+00	0.000E+00	9.594E-15	2.273E-13	8.385E-12	2.256E-10	8.253E-09	2.141E-
Ra-226	∑DOSE(j):		0.000E+00	9.584E-09	8.622E-08	9.567E-07	8.575E-06	9.387E-05	8.061E-
Pb-210	U-234	1.000E+00	0.000E+00	1.166E-13	3.098E-12	1.088E-10	2.543E-09	6.207E-08	7.922E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	4.550E-18	7.244E-16	5.231E-14	4.574E-12	1.924E-
Pb-210	∑DOSE(j):		0.000E+00	1.166E-13	3.098E-12	1.088E-10	2.543E-09	6.208E-08	7.924E-
U-235	U-235	1.000E+00	2.662E-03	2.662E-03	2.662E-03	2.662E-03	2.662E-03	2.661E-03	2.660E-
Pa-231	U-235	1.000E+00	0.000E+00	3.065E-08	9.194E-08	3.064E-07	9.191E-07	3.061E-06	9.159E-
Ac-227	U-235	1.000E+00	0.000E+00	3.219E-09	2.837E-08	2.934E-07	2.181E-06	1.427E-05	5.470E-
U-238	U-238	1.000E+00	1.037E-02	1.037E-02	1.037E-02	1.037E-02	1.037E-02	1.037E-02	1.036E-

BRF(i) is the branch fraction of the parent nuclide.

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+
U-234	U-234	1.000E+00	5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.069E-01	5.067E-01	5.062E-
U-234	U-238	1.000E+00	0.000E+00	1.332E-06	3.997E-06	1.332E-05	3.997E-05	1.332E-04	3.993E-
U-234	∑S(j):		5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.070E-01	5.069E-01	5.066E-
Th-230	U-234	1.000E+00	0.000E+00	4.564E-06	1.369E-05	4.564E-05	1.369E-04	4.561E-04	1.366E-
Th-230	U-238	1.000E+00	0.000E+00	5.997E-12	5.397E-11	5.997E-10	5.397E-09	5.994E-08	5.389E-
Th-230	∑S(j):		0.000E+00	4.564E-06	1.369E-05	4.564E-05	1.369E-04	4.561E-04	1.367E-
Ra-226	U-234	1.000E+00	0.000E+00	9.884E-10	8.893E-09	9.871E-08	8.858E-07	9.740E-06	8.511E-
Ra-226	U-238	1.000E+00	0.000E+00	9.895E-16	2.345E-14	8.652E-13	2.330E-11	8.563E-10	2.261E-
Ra-226	∑S(j):		0.000E+00	9.884E-10	8.893E-09	9.871E-08	8.858E-07	9.740E-06	8.513E-
Pb-210	U-234	1.000E+00	0.000E+00	1.016E-11	2.701E-10	9.483E-09	2.217E-07	5.412E-06	6.907E-
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	3.967E-16	6.316E-14	4.561E-12	3.988E-10	1.677E-
Pb-210	∑S(j):		0.000E+00	1.016E-11	2.701E-10	9.483E-09	2.217E-07	5.412E-06	6.908E-
U-235	U-235	1.000E+00	2.300E-02	2.300E-02	2.300E-02	2.300E-02	2.300E-02	2.299E-02	2.298E-
Pa-231	U-235	1.000E+00	0.000E+00	4.866E-07	1.460E-06	4.866E-06	1.459E-05	4.860E-05	1.454E-
Ac-227	U-235	1.000E+00	0.000E+00	7.665E-09	6.755E-08	6.985E-07	5.193E-06	3.397E-05	1.302E-
U-238	U-238	1.000E+00	4.700E-01	4.700E-01	4.700E-01	4.700E-01	4.700E-01	4.699E-01	4.697E-

BRF(i) is the branch fraction of the parent nuclide.