Interim Report on Sediment Contamination in the South Fork of Acid Canyon

LA-UR-00-1903

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April 27, 2000

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Date: April 28, 2000
Refer to: ER2000-0214

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Mr. Ted Taylor
Department of Energy
Los Alamos Area Office, MS A316
Los Alamos, NM 87545

SUBJECT: INTERIM REPORT ON ACID CANYON

Dear Ted:

Enclosed are two copies of the report entitled "Interim Report on Sediment Contamination in the South Fork of Acid Canyon." This report was prepared following the assessment approach agreed upon in meetings with the Department of Energy (DOE)-Los Alamos Area Office and DOE-Albquerque, and incorporates input on specific risk assessment parameters by the New Mexico Environment Department. This report also incorporates review comments by Joe Mose. If you have any questions or comments, please contact Allyn Pratt at (505) 667-4308 or Steven Reneau at (505) 665-3151.

Sincerely,

Julie A. Canepa, Program Manager
Environmental Restoration

JC/RB/ev

Attachment 22

Enclosure: Interim Report on Sediment Contamination in the South Fork of Acid Canyon LA-UR-00-1903

Cy (w/enc.):
R. Bohn, E/ER, MS M992
R. Borders, LAAO, MS A316
M. Buksa, E/ER, MS M992
D. Katzman, EES-13, MS M992
J. Mose, LAAO, MS A316
R. Perona, E/ER, MS M969
A. Pratt, EES-13, MS M992
S. Reneau, EES-1, MS D462
R. Ryti, E/ER, MS M969
L. Soholt, E/ER, MS M992
M. Tardiff, E/ER, MS M969
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E/ER File, MS M992
RPF, MS M707

Cy (w/o enc.):
J. Canepa, E/ER, MS M992

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Executive Summary

The purpose of this interim report is to present results of an investigation of sediment contamination in the South Fork of Acid Canyon and to present a preliminary human-health radiation dose assessment to evaluate if there is a need for immediate remedial action to protect human health. This report is restricted to radionuclide contaminants to address specific concerns raised by stakeholders in Fall 1999. Results from samples collected in 1999 by the Los Alamos National Laboratory Environmental Restoration Project, the New Mexico Environment Department (NMED) Oversight Bureau, and the Environmental Protection Agency (EPA) are presented and evaluated.

RESRAD software was used in this assessment to be consistent with Department of Energy (DOE) guidelines for evaluating potential radiation dose. Reasonable maximum exposure estimates were prepared for "extended backyard" and "trail user" scenarios, incorporating appropriate upper-bound parameter values recommended in EPA guidance documents and input from NMED. Based on EPA's proposed 40CFR196 regulations and DOE guidance, a dose less than 15 mrem/year above background is considered protective of human health.

Single radionuclide soil guidelines (SRSGs) were calculated using RESRAD software for "extended backyard" and "trail user" scenarios with the dose set at 15 mrem/year. Maximum values for two radionuclides, plutonium-239,240 and americium-241, exceed SRSGs for one or more exposure scenarios. Average concentrations of plutonium-239,240 exceed extended backyard SRSGs for geomorphic units that comprise an area of 50 m^2 out of the total area of sediments in the canyon bottom of 1100 m^2. Calculated dose based on average concentrations along the South Fork is less than 15 mrem/year for all scenarios, but concentrations in the most contaminated areas fail a "hot spot" criterion and indicate a need for further site-specific dose assessment. Application of site-specific inhomogeneous contamination calculations produces a realistic upper bound estimate of dose at less than 15 mrem/year. Thus, the assessment shows that there is no immediate or unacceptable dose to recreational users of the South Fork of Acid Canyon from radionuclides in sediments.

Although the assessment shows doses that are below EPA-recommended limits, if remediation was desired for other reasons, then the "hot spot" criterion could provide one possible basis for selecting sites for cleanup. DOE is committed to protecting human health and the environment. DOE will evaluate reasonable alternative actions which

could be taken to reduce contamination of sediments in the South Fork of Acid Canyon to further reduce doses to as low as reasonably achievable. Assessment of the risk from non-radionuclides, impacts on ecological receptors, and risk from contamination in surface water are pending further data analysis and interpretation.

Introduction

This report presents a preliminary human-health radiation dose assessment for radioactive contaminants in sediments in the South Fork of Acid Canyon. This report is not intended to be a final assessment of the potential risk from contaminants in Acid Canyon, but instead to be an interim report to address specific concerns raised by stakeholders in Fall 1999 and to evaluate the need for immediate remedial action. Assessment of non-radionuclides, assessment of potential ecological risk, and formal documentation of potential dose from radionuclides will be included in a future Surface Aggregate Report for Los Alamos Canyon and Pueblo Canyon. The dose assessment approach used in this report was designed to be consistent with requirements and guidance in Department of Energy (DOE) Orders and companion materials (e.g., RESRAD software), and to incorporate relevant Environmental Protection Agency (EPA) risk assessment guidance. This approach also incorporates specific input from the DOE Los Alamos Area Office, the DOE Albuquerque Operations Office, the Analysis and Assessments Focus Area of the Environmental Restoration (ER) Project, the New Mexico Environment Department (NMED), and EPA Region VI.

Background

Acid Canyon received radioactive liquid waste from Laboratory operations between 1944 and 1964 (Stoker et al. 1981, LANL 1992). From 1944 to 1951, untreated radioactive effluent from former Technical Area (TA) 1 was discharged into the head of the South Fork of Acid Canyon. From 1951 to 1964, effluent from a radioactive liquid waste treatment plant at former TA-45 was discharged into the South Fork. In 1966, structures at TA-45 were demolished and contaminated soils on the mesa top were excavated, and the area was transferred to Los Alamos County in 1967. The site of TA-45 is now the location of a County Skateboard Park, and Acid Canyon contains several trails and is used for dispersed outdoor recreation Figure 1 shows the location of the South Fork and trails, roads, and buildings in nearby areas.

Radioactive contaminants in Acid Canyon sediments were first investigated in 1946 (Kingsley, 1947), and subsequently in a series of different programs. Annual sampling of channel-bed sediments occurred at the mouth of Acid Canyon from 1951 to 1961 (Stoker et al. 1981), and from 1970 to present as part of the Laboratory's Environmental Surveillance Program (e.g., Environmental Surveillance Program 1999). Extensive sampling of channel-bed sediment occurred in 1972 and 1973 by the Laboratory's Environmental Science Group (e.g., Hakonson et al. 1973, Hakonson and Bostick 1976, Nyhan et al. 1976a, Nyhan et al. 1976b). Sampling of both channel and bank sediments occurred in 1977 under the Formerly Utilized Sites Remedial Action Program (FUSRAP), and this work concluded that there was no significant health risk from

sediments in Acid Canyon and no need for remediation of the canyon bottom (Stoker et al. 1981). Additional sampling occurred in 1992 and 1993 by the ER Project, following an EPA-approved work plan (LANL 1992), and this work also concluded that there was no significant health risk and no need for remediation (LANL 1995, 1996).

In January 1999, the DOE Oversight Bureau of the NMED (NMED-OB) collected a sample of fine-grained floodplain sediment in the South Fork of Acid Canyon and found levels of some radionuclides higher than previously reported, raising questions about the adequacy of prior characterization. The Canyons Focus Area (CFA) of the ER Project then added investigations in Acid Canyon to its baseline to fill in data gaps and reduce uncertainties about potential human-health and ecological risk. In August 1999, the NMED-OB collected additional fine-grained sediment samples in the South Fork and found one value of plutonium-239,240 higher than previously reported, raising additional concerns about potential human-health risks in Acid Canyon (Yanicak et al. 1999). In November 1999, the CFA conducted phase 1 investigations in Acid Canyon following the technical approach in the NMED-approved *Core Document for Canyons Investigations* (LANL 1997). Additional samples were collected by a subcontractor to EPA Region VI in December 1999.

Canyons Focus Area Field Investigations

The CFA sediment investigations follow a science-based characterization approach that is designed to iteratively reduce uncertainties in levels of contamination and risk, and to cost-effectively focus sampling activities (LANL 1997). Sediment sampling is preceded by a thorough geomorphic characterization that includes mapping the distribution of potentially-contaminated sediment deposits, describing the nature and thickness of these deposits, and extensive field radiological screening where appropriate. Sample sites are then selected to evaluate the general variations in contaminants between different geomorphic units, biasing samples towards sediment where contaminant concentrations are expected to be highest as well as sampling more representative units. Phase 1 sampling typically includes a relatively small number of samples for an extensive "full-suite" of potential contaminants, including radionuclides, inorganic chemicals, and organic chemicals, to allow subsequent sampling to be focused on analytes that are most important for evaluating risk. If sufficient data already exists in a canyon to identify which contaminants are the main risk drivers, then phase 1 sampling may also include a larger number of samples for these "key contaminants." Following assessment of phase 1 data, phase 2 sampling is then tailored to reduce remaining uncertainties, focusing on a "limited-suite" of analytes that include identified contaminants as well as samples for key contaminant analyses. Phase 3 sampling may also occur in some areas to address uncertainties identified by assessment of phase 2 data.

The phase 1 activities conducted in Acid Canyon in November 1999 included work in both the South Fork of Acid Canyon and main Acid Canyon upstream and downstream of the South Fork. The most extensive work was conducted in the South Fork (reach ACS) because this is the area where NMED-OB had expressed concerns about potential human-health risk. Field work in reach ACS included mapping the entire 290 m long canyon

between the base of the hillslope and the confluence with main Acid Canyon, and collecting field radiological data for alpha, beta, and gamma radiation at 48 locations, including the NMED-OB sample sites. The radiological data were collected at 10 cm intervals from the surface to as deep as 1.5 m. Detailed descriptions of sediment layers were made at these same locations. The radiological data and field descriptions were used to subdivide the area of potentially contaminated sediment into six different geomorphic units based on variations in sediment grain size, age, and levels of radiation. The geomorphic map and the locations of field measurements and samples are shown in Figure 2, and descriptions of these geomorphic units are presented in Table 1.

Table 1
Geomorphic Units in the South Fork of Acid Canyon (Reach ACS)

Geomorphic Unit	Description
c1	active channel; coarse sand and gravel or bare tuff bedrock
c1b	areas of fine-grained sediment deposition adjacent to active channel
c2	abandoned channel units containing fine-grained sediment deposits with relatively low levels of alpha radiation
c3	abandoned channel units containing fine-grained sediment deposits with relatively high levels of alpha radiation
f1	floodplain units containing fine-grained sediment deposits with relatively low levels of alpha radiation
f1a	floodplain units containing fine-grained sediment deposits with relatively high levels of alpha radiation

Data on the area, thickness, field radiation levels, and estimated average plutonium concentrations in each geomorphic unit were used to select phase 1 sample locations in reach ACS. Estimated plutonium concentrations in each unit were based on the analyses previously obtained by LANL (1996) and Yanicak et al. (1999). Samples were allocated to each geomorphic unit and to both fine-grained and coarse-grained layers in these units, biased to fine-grained sediments and to units where the highest field radiation was measured. A total of 31 samples were collected from eleven sampling locations in contaminated geomorphic units along the stream channel, including two field duplicates, and samples were collected at up to five depth intervals. Six samples were collected for an extensive analytical suite that included all analytes previously identified as chemicals of potential concern (COPCs) in either the South Fork or downstream in Acid Canyon or Pueblo Canyon. These samples included the sediment layers where the highest field alpha, beta, and gamma radiation were measured, as well as more representative locations with lower levels of radiation. The remaining 25 samples were collected solely for isotopic plutonium analyses because available data from Pueblo Canyon (e.g., Reneau et al. 1998a) and Acid Canyon (e.g., Yanicak et al. 1999) indicated that plutonium-239,240 was the main risk driver. In addition, two samples were collected from nearby trails to evaluate possible wind transport of plutonium away from the channel, including locations both up-canyon and down-canyon from the site of highest field alpha radiation.

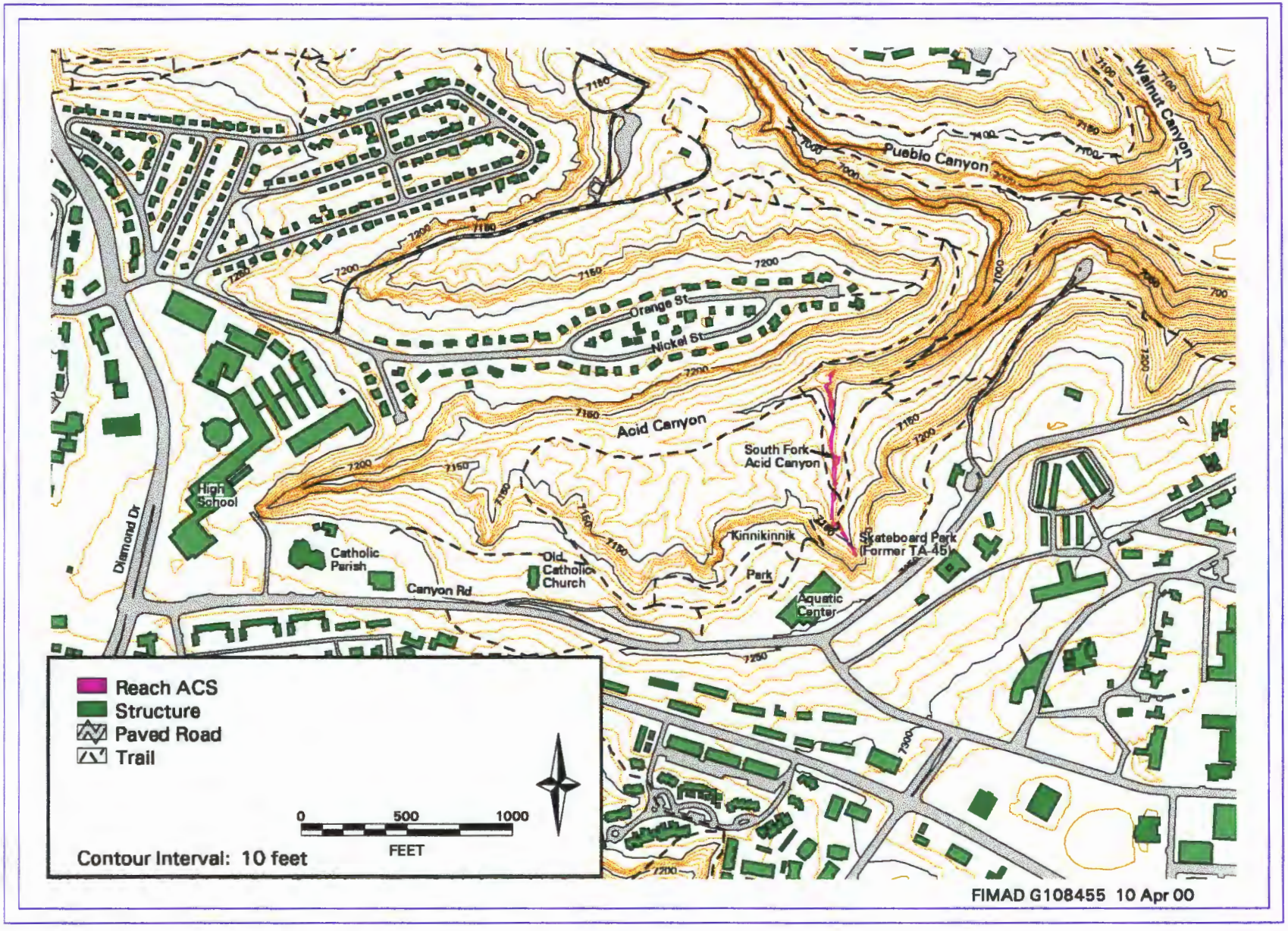

Figure 1. Acid Canyon Area

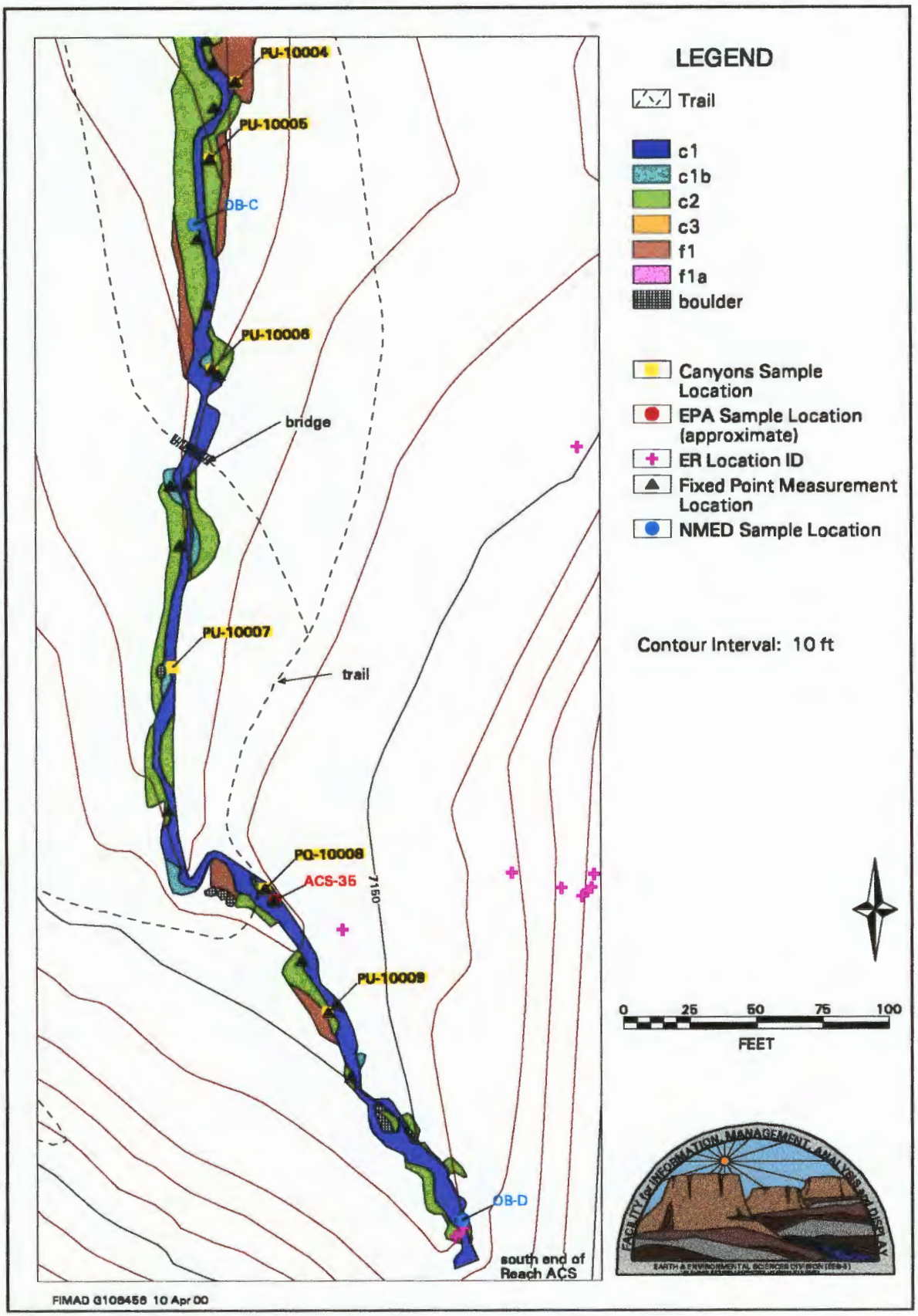

Figure 2a. Reach ACS (South) Geomorphology

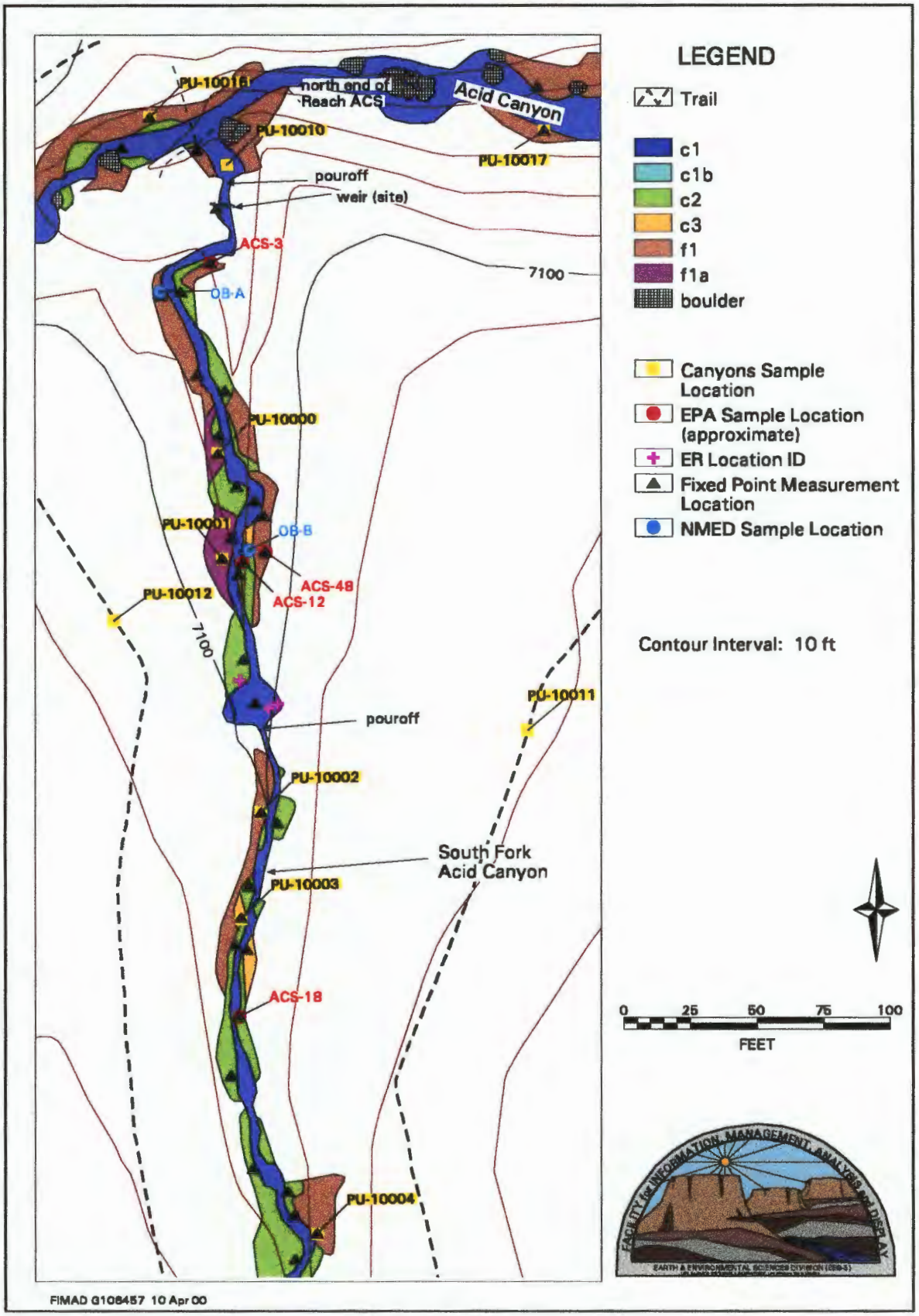

Figure 2b. Reach ACS (North) Geomorphology

Eleven additional samples were collected for an extensive analytical suite by subcontractors to EPA Region VI in December 1999, including five locations and up to four depths, and one field duplicate. Sample locations were chosen in collaboration with the CFA and NMED-OB to supplement the prior sampling. In total, 48 individual sediment layers at 20 locations along reach ACS were sampled in 1999 by the CFA, EPA, and NMED-OB, plus three field duplicates and two samples from adjacent trails. The analytical data were consistent with the field radiological measurements and supported the validity of using the field measurements to identify the areas with highest levels of radionuclide contamination and to guide sampling.

Assessment Approach

Radioactive chemicals of potential concern (COPCs) are identified if the reach-specific concentrations exceed naturally-occurring background concentrations or concentrations resulting from atmospheric fallout. Initial risk-based screening of human-health dose for this assessment is based on a comparison of maximum values for each of the radionuclide COPCs with human health screening values for a child playing along the stream channel (an "extended backyard" scenario) and for an adult using trails in the area (a "trail user" scenario). In previous reports on canyon sediments such screening values were called preliminary remediation goal (PRG) values (Reneau et al. 1998a, Reneau et al. 1998b, Reneau et al. 1998c, Katzman et al. 1999). The PRGs for radionuclides are replaced in this document by single radionuclide soil guidelines (SRSGs) calculated with RESRAD version 5.95 (Yu et al. 1993). This replacement of PRGs with SRSGs makes this preliminary dose assessment directly comparable to assessments performed for other sites administered by DOE/Albuquerque Operations Office. Radionuclides that contribute to a sum of quotients exceeding unity (sum of the ratio of maximum value to SRSG for all radionuclide COPCs) are considered further using area-weighted average calculations and elevated measurement comparisons.

The SRSGs are generated by using the exposure parameters associated with the extended backyard and trail user scenarios, as described below, and computing the contaminant concentration that would result in a dose of 15 mrem/year. The radiation dose limit of 15 mrem/yr follows proposed Environmental Protection Agency (EPA) guidelines (EPA 1997a), and is more protective of possible human health effects than the dose limit of 25 mrem/yr proposed by the US Nuclear Regulatory Commission for unrestricted use of a site (10 CFR 20, *Standards for Protection Against Radiation*) and the limit of 100 mrem/yr in US Department of Energy (DOE) Order 5400.5, *Radiation Protection of the Public and the Environment*. The dose limit of 15 mrem/year is also consistent with developing guidance from DOE/Albuquerque Operations Office. DOE has the additional policy of reducing all radiation exposures to levels that are as low as reasonably achievable (ALARA) and ALARA will be considered in any risk management evaluations that follow this preliminary assessment.

Reasonable Maximum Exposure Scenarios

There are five human exposure scenarios (resident, Laboratory worker, construction worker, trail user, and resource user) that have been previously developed by the ER Project for assessing potential effects from exposure to contaminated soil and sediments (Mirenda and Soholt 1999). The Laboratory worker scenario was developed for Laboratory Technical Areas and does not apply to Acid Canyon because it is Los Alamos County property. There are no edible plants in the area of contaminated sediments that would make a "resource user" scenario a reasonable selection, and there is no hunting permitted in this area. There are no residences in the canyon nor planned for the canyon, and therefore a standard residential exposure scenario is also not reasonable. Lastly, there are no utilities in the area of the contaminated sediments, nor are there any foreseeable trenching activities that would be consistent with a "construction worker" scenario.

Of the five standard human exposure scenarios, only the trail user is applicable to Acid Canyon. A well-used public trail crosses the contaminated sediments in one location, crosses the stream on a bridge in a second location, and lies within 10 m of the contaminated sediments for approximately 200 m. To account for the specific activities of jogging or hiking on this trail two variations of the trail user scenario have been developed for Acid Canyon.

Residential areas occur near Acid Canyon and it is possible that children could use the canyon as an extension to their backyard and play along the stream channel. Therefore, an "extended backyard" scenario for children was developed to supplement the trail user scenario. Because dose conversion factors for populations other than adult workers have not been published by DOE, adult dose conversion factors are applied to children in this assessment.

Both trail users and individuals off the trail along the stream channel could potentially be exposed to contaminated sediments through incidental ingestion, inhalation of suspended particles, and external gamma radiation. This preliminary assessment therefore identifies three exposure routes for radionuclide contaminants in sediments for both scenarios; soil ingestion, dust inhalation, and external irradiation. Water-related exposure pathways are not assessed because of the lack of surface water data from Acid Canyon. As noted above, the absence of edible plants or plant products in Acid Canyon precludes use of a plant ingestion pathway, and hunting of animals is prohibited in the area. Consistent with EPA guidance (*Risk Assessment Guidance for Superfund*, EPA 1989), a dermal absorption pathway is not evaluated for radionuclides.

The extended backyard and trail user exposure scenarios were developed using EPA-recommended upper-bound parameter values, when available and applicable, and constitute reasonable maximum exposure estimates. Primary sources for obtaining exposure parameter values include *Use of Standard Default Exposure Factors* (EPA 1991) and the *Exposure Factors Handbook* (EPA 1997b and 1997c). The extended backyard scenario assumes the use is entirely along the stream channel and in adjacent contaminated sediments (i.e., largely off trail use), and includes potential exposure to the

most contaminated sediments. For the trail user scenarios, exposure is based on concentrations observed in units present where the existing trail crosses the contaminated sediments.

The extended backyard scenario assumes that a child plays in the canyon bottom, or reach, for 200 hours each year, equivalent to 1 hour per day for approximately seven months out of each year. This exposure frequency is based on professional judgement, incorporating input from NMED. The greater exposure time used here (200 hours compared to 100 hours per year) than used in the child recreational scenario described by Mirenda and Soholt (1999, Table 22, "Values for Mesa-Top Scenario-Specific RESRAD Parameters"), is consistent with the assumption that the canyon may serve as extension of a residential play area for some children.

The jogger variation of the trail user scenario assumes that an adult is exposed for 10 minutes per daily jogging event to trailside contaminated sediments for 200 days each year (equivalent to 33.3 hours per year). The hiker variation of the trail user scenario assumes that an adult is exposed for 20 minutes per daily hiking event to trailside contaminated sediments for 200 days each year (equivalent to 66.7 hours per year). These exposure frequencies are based on professional judgement, incorporating input from NMED, and assume relatively high use because of proximity to residential areas and downtown Los Alamos. EPA Region VI, for comparison, recommends an exposure frequency of 60 days per year for recreational activities (EPA 1995). The 33 and 67 hours per year used here for the trail user scenarios are considered more appropriate than the 100 hours per year described by Mirenda and Soholt (1999) since the latter pertains to a mesa top recreational environment supporting activities additional to hiking and jogging and because reach ACS includes only a small part of an extensive trail system. For both trail user and extended backyard scenarios, the contaminated area is assumed to be 10,000 m^2, which is consistent with an infinite source for the external radiation and soil ingestion pathways and the default area assumption cited in the RESRAD documentation (Yu et al. 1993).

Changes to Default RESRAD Version 5.95 Parameters for Extended Backyard Scenario to Derive Single Radionuclide Soil Guidelines

Dose Limit: 15 mrem/year, consistent with EPA (1997a), Mirenda and Soholt (1999), and developing guidance from DOE/Albuquerque Operations Office. Note that 15 mrem/year is approximately equal to a carcinogenic risk of 3E-4 for an exposure duration of 30 years (EPA 1997a).

Radionuclides: Am-241, Cs-137, H-3, Pu-238, Pu-239, Sr-90, U-234, U-235, U-238

Pathways: External irradiation, soil ingestion, and dust inhalation. Other pathways (plant ingestion, meat consumption, fish consumption, radon inhalation, and water consumption) are not complete for the extended backyard scenario.

Leaching: The evapotranspiration coefficient was set at maximum value of 0.999. The irrigation rate was set to zero. Disabling irrigation and setting evapotranspiration to 0.999 results in no leaching of radionuclides into the vadose zone over time. This maximizes future surface dose (potentially important for the uranium isotopes) and maintains consistency with the approach used in the reach reports (Reneau et al. 1998a, Reneau et al. 1998b, Reneau et al. 1998c, Katzman et al. 1999). Using a maximum value for evapotranspiration also has the effect of maximizing the tritium flux and therefore minimizing the tritium SRSG, although this is not of significant concern because tritium is not present at levels high enough to affect dose.

Occupancy: RESRAD requires input for the annual fraction of time spent in indoor and outdoor environments on-site. The fraction of a year on-site spent indoors was set to zero. The fraction of a year on-site spent outdoors was set to 0.0228 for the extended backyard scenario (200 days per year for 1 hour per day, divided by 8760 hours in a year). The exposure frequency of 200 days per year is based on professional judgement and an assumption that outdoor activity occurs daily primarily during seven months of the year (April to October), following input from NMED. The exposure duration of one hour per day is also based on professional judgement, following input from NMED.

Inhalation Rate: The extended backyard input of 1.2 m^3/hour for a child corresponds to 10,500 m^3/year. This inhalation rate was also assumed for the child recreational scenario (Mirenda and Soholt 1999) and pertains to short-term exposures of children under moderate activity levels (EPA 1997b; Table 5-23). Moderate activity is appropriate based on the presence of physical obstacles (like downed trees and cliffs) along the stream channel that make high physical activity (like running) impractical for an entire hour. The assumption of moderate activity is also more consistent with assuming that the child spends all of their time within a 10,000 m^2 area, because high respiration rate activities such as running would presumably take the child over a broader spatial area.

Dust Mass Loading: The extended backyard input of 0.0002 g/m^3 was chosen to represent dusty conditions that could occur if children playing in the canyon stirred up dust during their activities. This value is based on the geometric mean of three values (0.002, 0.0001, and 0.00002) which include reasonable bounding limits. The highest value is a bounding value that considers the extreme case of mechanical disturbance, and is consistent with maximum values obtained by monitoring of heavy equipment operators excavating disposal pits at TA-54 (unpublished LANL data). The middle value was calculated using the Particulate Emission Factor model presented in EPA's *Soil Screening Guidance* (EPA 1996a, EPA 1996b), and is the same value used in the reach reports (Reneau et al. 1998a, Reneau et al. 1998b, Reneau et al. 1998c, Katzman et al. 1999) and in Mirenda and Soholt (1999). The lowest value is based on the average of Laboratory-specific dust mass loading values (PM-10, or particulate matter <10 μm in aerodynamic diameter), measured from 1990 to 1998 and presented in Environmental Surveillance Reports, which included measurements during fires when particulate concentrations were above average. The use of a geometric mean is based on the presumption that episodically high levels of dust are relatively infrequent, and therefore actual dust loading levels based on these three estimates may be well-characterized by a skewed (i.e.,

lognormal) distribution. The extended backyard input of 0.0002 g/m^3 is also equal to a value reported for farmyards that includes short periods at high dust loading (Gilbert et al. 1983).

Wind Speed: The wind speed used in the RESRAD calculations was 3 m/s based on Laboratory meteorological records (Bowen 1990; www.weather.lanl.gov/htmls/climatology.html), which is consistent with the value used in the reach reports (Reneau et al. 1998a, Reneau et al. 1998b, Reneau et al. 1998c, Katzman et al. 1999) and Mirenda and Soholt (1999).

Humidity: The humidity used in the RESRAD calculations was 5.5 g/m^3 (based on Laboratory meteorological records (Bowen 1990; www.weather.lanl.gov/htmls/climatology.html).

Soil Ingestion Rate: The on-site soil ingestion rate was set at 626 g/year, which compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. The value of 626 g for yearly soil intake was calculated as ([0.4 g/day soil ingestion rate / 5.6 hours/day outdoor activity] x 200 hours/year exposure frequency) / 0.0228 year site utilization fraction. The daily soil ingestion of 0.4 g/day is the upper percentile child soil ingestion value from EPA (1997b). We conservatively assume that 100% of the soil ingested comes from outdoor activity, although EPA recommends in the blood lead model that 45% of the dust comes from indoor sources and 55% comes from outdoor sources (EPA 1994). The amount of time a child spends outdoors, 5.6 hours/day, is an EPA-recommended value for use in exposure assessment (EPA 1997c). We note that the one hour per day assumed for the extended backyard implies that a child spends about 18% of their daily outdoor activity time in the reach.

The complete RESRAD summary report for the extended backyard scenario is provided as Appendix A.

Changes to Default RESRAD Version 5.95 Parameters for Trail User [Jogger] Scenario to Derive Single Radionuclide Soil Guidelines

Dose Limit: Same as for the extended backyard scenario.

Radionuclides: Same as for the extended backyard scenario.

Pathways: Same as for the extended backyard scenario.

Leaching: Same as for the extended backyard scenario.

Occupancy: The fraction of a year on-site spent indoors was set to zero. The fraction of a year on-site spent outdoors was set to 0.00381 (200 days per year for 1/6 hour per day, divided by 8760 hours in a year) for a total of 33.3 hours in a year. The exposure frequency of 200 days per year is based on professional judgement and an assumption

that outdoor activity occurs daily primarily during seven months of the year (April to October), following input from NMED. The exposure duration of 1/6 hour (or 10 minutes) per day is based on professional judgement of the amount of time needed to jog 600 m (300 m length of reach doubled to account for a roundtrip).

Inhalation Rate: The trail user [jogger] input of 3.2 m^3/hour for an adult corresponds to 28,000 m^3/year[1]. This inhalation rate is based on the final version of EPA's Exposure Factors Handbook (EPA 1997b) for adult short-term exposure under high activity levels to be consistent with running or jogging as the activity.

Dust Mass Loading: Same as for the extended backyard scenario, to be consistent with the possible physical disturbance of sediments from running or jogging.

Wind Speed: Same as for the extended backyard scenario.

Humidity: Same as for the extended backyard scenario.

Soil Ingestion Rate: The on-site soil ingestion rate was set at 584 g/year, which compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. The value of 584 g for yearly soil intake was calculated as ([0.1 g/day soil ingestion rate / 1.5 hours/day outdoor activity] x 33.3 hours/year exposure frequency) / 0.00381 year site utilization fraction. The daily soil ingestion of 0.1 g/day is the upper end of daily adult soil ingestion values reported in EPA (1997b). We conservatively assume that 100% of the soil ingested comes from outdoor activity. The outdoor time value of 1.5 hours/day for adults is recommended for exposure assessment in EPA (1997c) for the "most reliable" of the studies pertaining to adult soil ingestion. We note that the 1/6 hour (10 minutes) per day assumed for the jogger implies that the receptor spends about 11% of their average daily outdoor activity time in the reach.

The complete RESRAD summary report for the trail user [jogger] scenario is provided as Appendix B.

Changes to Default RESRAD Version 5.95 Parameters for Trail User [Hiker] Scenario to Derive Single Radionuclide Soil Guidelines

Dose Limit: Same as for the extended backyard scenario.

Radionuclides: Same as for the extended backyard scenario.

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[1] Because the maximum value in RESRAD for this parameter is 20,000 m^3/year, an adjustment was made to the dust mass loading value. Specifically one-half of the desired inhalation rate was used as the input to RESRAD (14,000 m^3/year) and twice the desired dust mass loading value was used (0.0004 g/m^3 instead of 0.0002 g/m^3). This adjustment corrects the inputs to the RESRAD model for the inhalation of particulate pathway, but has an unwanted effect on the calculation of the tritium SRSG. Because the tritium SRSG is minimized by use of the maximum evapotranspiration value, no other corrections to the inhalation rate to account for exposure to tritium in air are warranted.

Pathways: Same as for the extended backyard scenario.

Leaching: Same as for the extended backyard scenario.

Occupancy: The fraction of a year on-site spent indoors was set to zero. The fraction of a year on-site spent outdoors was set to 0.00761 (200 days per year for 1/3 hour per day, divided by 8760 hours in a year) for a total of 66.7 hours in a year. The exposure frequency of 200 days per year is based on professional judgement and an assumption that outdoor activity occurs daily primarily during seven months of the year (April to October), following input from NMED. The exposure duration of 1/3 hour (or 20 minutes) per day is based on professional judgement of the amount of time needed to walk 600 m (300 m length of reach doubled to account for a roundtrip).

Inhalation Rate: The trail user [hiker] input of 1.6 m^3/hour for an adult corresponds to 14,000 m^3/year. This inhalation rate is based on the final version of EPA's Exposure Factors Handbook (EPA 1997b) for adult short-term exposure under moderate activity levels to be consistent with walking or hiking as the activity.

Dust Mass Loading: The trail user [hiker] input of 0.00002 g/m^3 is based on values reported in Environmental Surveillance Reports for dust mass loading values (PM-10). These data represent average dust levels from several time periods to include measurements during dry, windy conditions (including samples collected during large fires). Thus, this dust mass loading value is viewed to represent the high end of ambient levels that could be encountered over a chronic exposure period without anthropogenic soil disturbance.

Wind Speed: Same as for the extended backyard scenario.

Humidity: Same as for the extended backyard scenario.

Soil Ingestion Rate: The on-site soil ingestion rate was set at 584 g/year, which compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. The value of 584 g for yearly soil intake was calculated as ([0.1 g/day soil ingestion rate / 1.5 hours/day outdoor activity] x 66.7 hours/year exposure frequency) / 0.00761 year site utilization fraction. The daily soil ingestion of 0.1 g/day is the upper end of daily adult soil ingestion values reported in EPA (1997b) for the "most reliable" of the studies pertaining to adult soil ingestion. We conservatively assume that 100% of the soil ingested comes from outdoor activity. The outdoor time value of 1.5 hours/day for adults is recommended for exposure assessment in EPA (1997c). We note that the 1/3 hour (20 minutes) per day assumed for the hiker implies that the receptor spends about 22% of their average daily outdoor activity time in the reach.

The complete RESRAD summary report for the trail user [hiker] scenario is provided as Appendix C.

The resulting SRSGs calculated for extended backyard and trail user scenarios using the preceding parameters are summarized in Table 2.

Table 2
RESRAD Single Radionuclide Soil Guidelines
for Extended Backyard and Trail User Scenarios Based on 15 mrem/year Dose

Radionuclide	Extended Backyard SRSG (pCi/g)	Trail User (Jogger) SRSG (pCi/g)	Trail User (Hiker) SRSG (pCi/g)
americium-241	270	1600	900
cesium-137+D	210	1200	620
tritium	38000	29000	29000
plutonium-238	310	1800	1100
plutonium-239,240	280	1600	950
strontium-90+D	5500	35000	18000
uranium-234	3000	14000	12000
Uranium-235+D	710	4000	2200
Uranium-238+D	2000	10000	6800

+D indicates "plus daughter radionuclides"

Results

Analytical Results: Radionuclide results were obtained by gamma spectroscopy, alpha spectroscopy, and beta counting for samples collected in reach ACS. Focused data validation was performed for all samples collected in 1999 to assure the quality of the data, following ER Project procedures. Appendix D provides the results and data qualifiers for reach ACS samples. There are no detected values for cesium-134, cobalt-60, europium-152, ruthenium-106, and sodium-22, and these radionuclides will not be considered in this preliminary dose assessment. Americium-241 was measured by both gamma and alpha spectroscopy, and for samples where results from both methods are available the higher value is used in the assessment. Uranium-235 was not detected by gamma spectroscopy so the uranium-235 results from alpha spectroscopy will be used in the dose assessment. The detected radionuclides include americium-241, cesium-137, tritium, plutonium-238, plutonium-239,240, uranium-234, uranium-235, uranium-238, and strontium-90. Each of these detected radionuclides was measured above the background value (Ryti et al. 1998) in at least one sample and are evaluated in this preliminary dose assessment. Statistical comparisons to background are not necessary for these radionuclides because all are clearly above background. The maximum values and background values for these detected radionuclides are summarized in Table 3. Gross alpha and beta radiation were also detected, because only specific radionuclides can be evaluated in dose assessment it is assumed that the specific radionuclides identified above background are also those associated with elevated gross radioactivity.

Table 3
Maximum Values for Reach ACS Samples and Background Values

Radionuclide	Maximum value (pCi/g)	Background value (pCi/g)
americium-241	278	0.04
cesium-137	148	0.9
tritium	1.86	0.093
plutonium-238	37.3	0.006
plutonium-239,240	7780	0.068
strontium-90	80	1.04
uranium-234	21.5	2.59
uranium-235	2	0.2
uranium-238	16.6	2.29

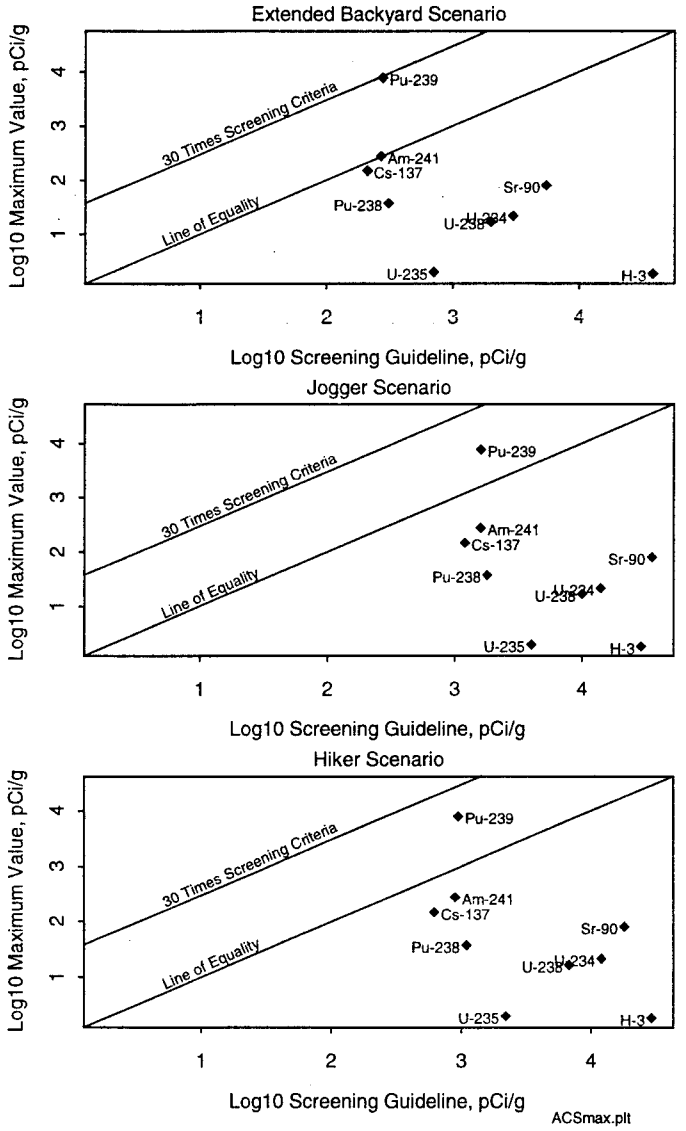
Comparison to SRSGs: The maximum values of the nine radionuclides present above background are compared with the SRSGs in Table 4 and Figure 3. The extended backyard SRSG is exceeded by the maximum values for americium-241 and plutonium-239,240. The maximum value for plutonium-239,240 also exceeds the trail user SRSGs. In addition, the maximum cesium-137 concentration is a significant fraction of the extended backyard SRSG. Because the maximum values for two radionuclides exceed SRSGs, further analysis of the data by geomorphic unit is needed to estimate receptor doses.

Table 4
Comparison of Maximum ACS Value to RESRAD Single Radionuclide Soil Guidelines for Extended Backyard and Trail User Scenarios

Radionuclide	Maximum value (pCi/g)	Extended Backyard SRSG (pCi/g)	Trail User Jogger SRSG (pCi/g)	Trail User Hiker SRSG (pCi/g)
americium-241	278	**270 ***	1600	900
cesium-137	148	210	1200	620
tritium	1.86	38000	29000	29000
plutonium-238	37.3	310	1800	1100
plutonium-239,240	7780	**280**	**1600**	**950**
strontium-90	80	5500	35000	18000
uranium-234	21.5	3000	14000	12000
uranium-235	2	710	4000	2200
uranium-238	16.6	2000	10000	6800

* Values in bold indicate SRSGs that are exceeded by maximum results.

Figure 3. Reach ACS Maximum Value Comparisons to Single Radionuclide Screening Guides and to 30 Times those Criteria



Calculation of Reach Average Concentrations: The exposure scenarios are intended to be applied to the entire length of reach ACS. Consequently, "most likely" concentrations must be calculated for each radionuclide. Weighted averages were calculated to provide an estimate of the "most likely" average concentrations in reach ACS. The average concentration in each geomorphic unit was calculated for all radionuclides above background, and concentrations were calculated separately for fine-grained sediment and coarse-grained sediment in the different units. Average concentrations for the fine-grained sediments are used in this assessment for units containing both fine-grained and coarse-grained sediment layers. The separation of data for fine-grained and coarse-grained sediments is made because the former generally have higher concentrations and

occur at or closer to the ground surface, and this separation provides a more realistic assessment of dose from those particles most susceptible to ingestion and inhalation. This information will also be useful in establishing the radionuclide contaminant inventory and its relative distribution, which will support evaluation of how various risk management options could affect dose. The geomorphic unit bins and the calculated averages are provided in Appendix E. Duplicate samples were not used in calculating averages to avoid overweighting specific locations, following the convention used previously in the reach reports (Reneau et al. 1998a, Reneau et al. 1998b, Reneau et al. 1998c, Katzman et al. 1999). The concentration for americium-241 from unit c1b is missing because this value was rejected during data validation. A surrogate value of 0.19 pCi/g was used from unit c1 because the plutonium-239,240 values were similar for these geomorphic units and americium-241 concentrations are related to plutonium-239,240 concentrations in reach ACS.

For radionuclides detected above background, area-weighted average concentrations were calculated combining data from all contaminated geomorphic units in reach ACS. These weighted averages are the combined products of the average concentration in each geomorphic unit and the fraction of the total reach area contained in that unit. For example, if ten samples were collected from a geomorphic unit that encompasses 5% of the total area, then the average of these ten sample results is multiplied by 0.05 in calculating an area-weighted average. This calculation is repeated for all geomorphic units and the results are summed to obtain the reach weighted average concentrations. Reach reports (Reneau et al. 1998a, Reneau et al. 1998b, Reneau et al. 1998b, Katzman et al. 1999) contain examples of this process of calculating weighted averages for canyon sediments. For the extended backyard scenario the weighted average calculations include all geomorphic units in the reach. However, the weighted average for the trail user scenarios only include the c1 and c2 geomorphic units because the trail only crosses these units. The weighted averages used in the preliminary dose calculations are provided in Tables 5, 6, and 7.

Homogeneous Contamination Dose Calculations: The sum of SRSG quotients for radionuclides was calculated based on the weighted averages described above. This assessment is equivalent to the homogeneous contamination calculations described in the RESRAD manual (Yu et al. 1993), which are designed for cases where contamination is approximately uniform across the contaminated area. A sum equal to 1 is equivalent to a dose of 15 mrem/yr from all radionuclide contributions to the sum. If the sum is less than 1, then there is typically no need for any further assessment of the potential dose from average reach concentrations.

Table 5 shows that the estimated dose for the extended backyard scenario is 12.7 mrem/year, and that about 89% of the dose comes from plutonium-239,240. In addition, about 55% of the dose from the reach comes from two geomorphic units (c3 and f1a) that comprise only 5% of the total reach area (Figure 4). The greatly disproportionate contribution of c3 and f1a to dose suggests that inhomogeneous contamination calculations, as described in the RESRAD manual, are appropriate for the reach. We also note that the average concentration of plutonium-239,240 in c3 and f1a are greater than

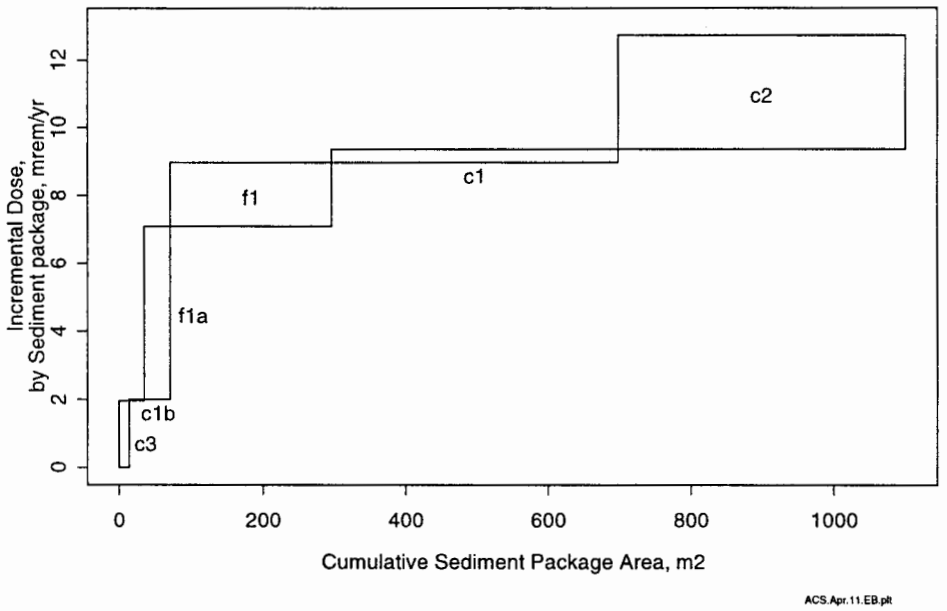
Table 5
Acid Canyon Estimated Dose for Extended Backyard Scenario Based on the Generic SRSGs

	Geomorphic Unit/Facies						
	c1/ coarse	c1b/ fine	c2/ fine	c3/ fine	f1/ fine	f1a/ fine	Total
Area (m^2)	402	21	402	14	225	36	1100
Fraction of Total Area	0.365	0.019	0.365	0.013	0.205	0.033	1.0

	Radionuclide Average Concentrations by Geomorphic Unit (pCi/g)								
Radionuclide	c1/ coarse	c1b/ fine	c2/ fine	c3/ fine	f1/ fine	f1a/ fine	ACS weighted average (pCi/g)	SRSG (pCi/g)	Dose (mrem/yr)
Am-241	0.19	0.19	14.1	126	14.1	126	13.8	270	0.77
Cs-137	0.16	0.12	12.4	8.2	12.4	8.2	7.50	210	0.54
H-3	0.0069	0.0048	0.93	0.047	0.93	0.047	0.53	38000	<0.01
Pu-238	0.058	0.12	0.81	10.6	0.81	10.6	0.97	310	0.05
Pu-239,240	18.6	26	139	2740	139	2740	211	280	11.3
Sr-90	0.55	0.38	6.91	59.7	6.91	59.7	6.86	5500	0.02
U-234	0.65	1.27	3.83	10.5	3.83	10.5	2.92	3000	0.01
U-235	0.035	0.076	0.34	1.03	0.34	1.03	0.25	710	0.01
U-238	0.54	1.00	2.42	7.06	2.42	7.06	1.92	2000	0.01

Estimated Dose for Geomorphic Unit (mrem/yr)						Total Dose (mrem/yr)
0.38	0.03	3.37	1.97	1.89	5.08	12.7

Figure 4. Reach ACS Sediment Package Contributions To Radiation Dose For The Extended Backyard Scenario



the SRSG. Contribution of dose by pathway can be evaluated by reviewing the RESRAD output file provided as Appendix A, which shows that that about 90% of the dose is from the soil ingestion pathway with about 5% coming from external gamma radiation and about 5% coming from the inhalation pathway.

The estimated dose for the trail user [jogger] is 0.9 mrem/year (Table 6), and about 89% of the dose comes from plutonium-239,240. The estimated dose for the jogger is less than 10% of the estimated dose for the extended backyard scenario. This difference is largely due to different exposure concentrations for these scenarios and the fewer hours per year assumed on-site for the jogger. Most of the dose comes from the c2 geomorphic unit because the concentrations in that unit are about seven times higher than in the c1 unit. However, none of the c1 or c2 average concentrations exceed the SRSGs. Contributions to dose by pathway can be evaluated by reviewing the RESRAD output file provided as Appendix B, which shows that about 82% of the dose is from the soil ingestion pathway with about 4% coming from external gamma radiation and about 14% coming from the inhalation pathway. A greater fraction comes from the inhalation pathway compared to the extended backyard scenario due to the higher activity level (and, therefore higher inhalation rate) assumed for the jogger.

Table 6
Acid Canyon Estimated Dose for Trail User [Jogger] Scenario
Based on the Generic SRSGs

	Geomorphic Unit		
	c1/ coarse	c2/ fine	Total
Area (m2)	402	402	804
Fraction of Total Area	0.500	0.500	1.0

	Radionuclide Average Concentrations by Geomorphic Unit (pCi/g)		c1/c2 weighted average (pCi/g)	SRSG (pCi/g)	Dose (mrem/yr)
Radionuclide	c1/ coarse	c2/ fine			
Am-241	0.19	14.1	7.1	1600	0.067
Cs-137	0.16	12.4	6.3	1200	0.079
H-3	0.0069	0.93	0.5	29000	0.000
Pu-238	0.058	0.81	0.4	1800	0.004
Pu-239,240	18.6	139	78.8	1600	0.739
Sr-90	0.55	6.91	3.7	35000	0.002
U-234	0.65	3.83	2.2	14000	0.002
U-235	0.035	0.34	0.2	4000	0.001
U-238	0.54	2.42	1.5	10000	0.002

Estimated Dose for Geomorphic Unit (mrem/yr)		Total Dose (mrem/yr)
0.090	0.805	0.9

The estimated dose for the trail user [hiker] is 1.5 mrem/year (Table 7), and about 88% of the dose comes from plutonium-239,240. The estimated dose for the hiker is somewhat more than 10% of the estimated dose for the extended backyard scenario based on the difference in the exposure concentration for these scenarios and the fewer hours per year assumed on-site for the hiker. Most of the dose comes from the c2 geomorphic unit because the concentrations in that unit are about seven times higher than in the c1 unit. None of the c1 or c2 average concentrations exceed the SRSGs. Contribution of dose by pathway can be evaluated by reviewing the RESRAD output file provided as Appendix C, which shows that that about 94% of the dose is from the soil ingestion pathway with about 5% coming from external gamma radiation and less than 1% coming from the inhalation pathway. A smaller fraction comes from the inhalation pathway compared to the jogger scenario due to the lower activity level (and therefore lower inhalation rate) assumed for the hiker.

Table 7
Acid Canyon Estimated Dose for Trail User [Hiker] Scenario
Based on the Generic SRSGs

	Geomorphic Unit		
	c1/ coarse	c2/ fine	Total
Area (m2)	402	402	804
Fraction of Total Area	0.500	0.500	1.0

	Radionuclide Average Concentrations by Geomorphic Unit (pCi/g)		c1/c2 weighted average (pCi/g)	SRSG (pCi/g)	Dose (mrem/yr)
Radionuclide	c1/ coarse	c2/ fine			
Am-241	0.19	14.1	7.1	900	0.119
Cs-137	0.16	12.4	6.3	620	0.152
H-3	0.0069	0.93	0.5	29000	0.000
Pu-238	0.058	0.81	0.4	1100	0.006
Pu-239,240	18.6	139	78.8	950	1.244
Sr-90	0.55	6.91	3.7	18000	0.003
U-234	0.65	3.83	2.2	12000	0.003
U-235	0.035	0.34	0.2	2200	0.001
U-238	0.54	2.42	1.5	6800	0.003

Estimated Dose for Geomorphic Unit (mrem/yr)		Total Dose (mrem/yr)
0.152	1.380	1.5

Hot Spot/Elevated Measurement Comparisons: The phrase "hot spot" has been used to describe small areas that have levels of residual radioactive material that are considerably above levels in surrounding areas, and DOE provides specific criterion for evaluating such areas of elevated radioactivity. This evaluation includes use of an "area adjustment factor" that adjusts SRSGs dependant on the actual size of a "hot spot". The "hot spot" area adjustment factor from DOE Order 5400.5 was applied to each geomorphic unit where at least one radionuclide has an average concentration that exceeds the SRSG. The adjustment factor (AF) is $1/(\frac{A}{100})^{0.5}$, where A is area of a geomorphic unit in m^2 if the area is less than 25 m^2 (for areas >25 m^2, the AF is 1). For each of the radionuclides above background, the generic SRSG was modified and the adjusted sum of quotients total was calculated, and the sum was evaluated relative to 1. If the sum is less than 1, then there is no need for any further assessment of the potential dose from "hot spots." Plutonium-239,240 concentrations in the c3 and f1a geomorphic units are the only average concentrations that exceed the generic extended backyard SRSG (see Appendix E). None of the c1 and c2 average concentrations exceed the trail user SRSGs. Thus, the "hot spot" analysis is only needed for the c3 and f1a geomorphic units. There are five polygons (discrete areas) in the c3 and f1a geomorphic units (Figure 2b, Table 8). The areas of these polygons range from 3 to 25 m^2, which means that the adjustment factor ranges from 2 to 5.2 (Table 8). The average concentrations of plutonium-239,240 in the fine fraction of the c3 and f1a geomorphic units were evaluated in the "hot spot" analysis because the average concentration in these units were greater than the extended backyard SRSG. The average concentration of plutonium-239,240 in the coarse fraction of the c3 and f1a geomorphic units also exceeded the extended backyard SRSG, so the hot spot analysis was conducted for the coarse fraction in addition to the fine fraction of these units. The results are provided in Table 8 and show that the sum of quotients for the fine fraction of all five polygons exceeds 1, and that the coarse fraction for one of the f1a polygon exceeds 1. Thus, further site-specific dose assessment is needed, which is presented below.

The maximum value of each radionuclide was also compared to the SRSG following the DOE Order 5400.5 recommendation of taking reasonable actions whenever any location exceeds 30 times the authorized limit (interpreted to be SRSG for the purposes of this preliminary dose assessment). For example, the plutonium-239,240 SRSG is 280 pCi/g and 30 times the SRSG is 8,400 pCi/g. A line corresponding to 30 times the plutonium-239,240 SRSG is depicted on Figure 3, and shows that none of the maximum values are greater than 30 times the SRSG, although the maximum value for plutonium-239,240 is close for the extended backyard scenario (28 times the SRSG).

Table 8
Extended Backyard Scenario "Hot Spot" Analysis
Based on the Generic SRSGs

	Radionuclide								
	Am-241	Cs-137	H-3	Pu-238	Pu-239,240	Sr-90	U-234	U-235	U-238
SRSGs (pCi/g)	270	210	38000	310	280	5500	3000	710	2000
Average concentrations for c3, f1a "fines" bin (pCi/g)	126	8.2	0.047	10.6	**2740**	59.7	10.5	1.03	7.06

Unit/ Facies	Polygon	Area (m^2)	AF[1]	Am-241 ratio[2]	Cs-137 ratio	H-3 ratio	Pu-238 ratio	Pu-239, 240 ratio	Sr-90 ratio	U-234 ratio	U-235 ratio	U-238 ratio	Sum[3]
f1a/fine	north	11	3.1	0.15	0.01	0.00	0.01	3.20	0.00	0.00	0.00	0.00	3.4
f1a/fine	south	25	2.0	0.24	0.02	0.00	0.02	4.94	0.01	0.00	0.00	0.00	5.2
c3/fine	north	4	5.2	0.09	0.01	0.00	0.01	1.90	0.00	0.00	0.00	0.00	2.0
c3/fine	middle	3	5.4	0.09	0.01	0.00	0.01	1.80	0.00	0.00	0.00	0.00	1.9
c3/fine	south	7	3.7	0.13	0.01	0.00	0.01	2.62	0.00	0.00	0.00	0.00	2.8
	Total	**50**											

	Radionuclide								
	Am-241	Cs-137	H-3	Pu-238	Pu-239,240	Sr-90	U-234	U-235	U-238
SRSGs (pCi/g)	270	210	38000	310	280	5500	3000	710	2000
Average concentrations for c3, f1a "coarse" bin (pCi/g)	126	8.2	0.047	1.77	**574**	59.7	10.5	1.03	7.06

Unit/ Facies	Polygon	Area (m^2)	AF[2]	Am-241 ratio	Cs-137 ratio	H-3 ratio	Pu-238 ratio	Pu-239, 240 ratio	Sr-90 ratio	U-234 ratio	U-235 ratio	U-238 ratio	Sum
f1a coarse	north	11	3.1	0.15	0.01	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.8
f1a coarse	south	25	2.0	0.24	0.02	0.00	0.00	1.03	0.01	0.00	0.00	0.00	1.3
c3 coarse	north	4	5.2	0.09	0.01	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.5
c3 coarse	middle	3	5.4	0.09	0.01	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.5
c3 coarse	south	7	3.7	0.13	0.01	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.7
Total		**50**											

[1]AF is the adjustment factor ($1 \Big/ \left(\frac{A}{100}\right)^{0.5}$, where A is area of a geomorphic unit in m^2)

[2]The ratio is calculated as the average concentration divided by the adjusted generic SRSG (or SRSG * AF)

[3]The sum is the sum of ratios for all nine radionuclides.

Inhomogeneous Contamination Dose Calculations: The results of the "hot spot" analysis and the disproportionate contribution of c3 and f1a to dose indicate that a site-specific dose assessment for reach ACS should involve inhomogeneous contamination calculations for the extended backyard scenario. The basic concept of the inhomogeneous contamination calculations is provided in section 3.3 of the RESRAD manual (Yu et al. 1993), which also provides the calculations for dose from two concentration bins. The inhomogeneous area must be subdivided into areas of relatively homogeneous contamination to support dose assessment calculations. Reach ACS was subdivided into

three geomorphic unit bins based on the plutonium-239,240 concentrations (bin 1: c1, c1b; bin 2: c2, f1; and bin 3: c3, f1a). Bin 1 has the lowest concentrations and reflects the base conditions for the reach. Bin 2 and bin 3 have higher concentrations. The following equation shows the modification to the RESRAD inhomogeneous contamination calculations that was made to account for three concentration bins.

$$Dose = Dose_{base} + Dose_{bin2} + Dose_{bin3}$$

where:

$$Dose_{base} = \sum_{i=1}^{9} \frac{average_{bin1,i}}{SRSG_{ACS,i}},$$

$$Dose_{bin2} = \sum_{i=1}^{9} \frac{\left(average_{bin2,i} - average_{bin1,i}\right)}{SRSG_{bin2,i}},$$

$$Dose_{bin3} = \sum_{i=1}^{9} \frac{\left(average_{bin3,i} - average_{bin1,i}\right)}{SRSG_{bin3,i}},$$

and i is the radionuclide index variable.

SRSGs were calculated for the three bins, adjusting occupancy proportionate to the area of the geomorphic unit bin. The factors varied to calculate these site-specific SRSGs are summarized in Table 9. This table shows that occupancy was varied for each bin based on the relative surface area, and that the area assumed for each bin was equal to the entire reach area of 1,100 m^2. The RESRAD output files that document these SRSGs are provided as Appendices F, G, and H. The average concentrations for bin 1, which are used as the reach ACS base concentrations, are summarized in Table 10. Using these inhomogeneous contamination calculations, the total estimated dose is 12.6 mrem/year (Table 11), with about 37% of the dose coming from exposure to bin 2 (c2 and f1) and 56% coming from exposure to bin 3 (c3 and f1a). The dose estimated by the inhomogeneous contamination calculations is basically identical to the reach weighted average dose calculation. This suggests that the weighted average is an appropriate method for estimating dose from heterogeneous contamination. The reason that the inhomogeneous contamination dose estimate mirrors the reach weighted average is that only the site occupancy was varied. The size of the contaminated area bins could also have been varied, and this would also have affected the estimated dose. An initial run of the RESRAD model with bin-specific areas (e.g., area of bin 3 was 50 m^2) led to estimating about 4 mrem/year dose for reach ACS, and the reason for this lower dose estimate is the way that RESRAD scales soil ingestion with area. The basis for the RESRAD soil ingestion area factor is an assumed residential lot of 1,000 m^2, and thus is not directly relevant to the extended backyard scenario. For the purposes of the reach-specific ACS inhomogeneous contamination calculations, it was decided that only varying occupancy was more appropriate and also presented a more conservative estimate of dose. Because the extended backyard inhomogeneous dose calculations basically repeated the reach weighted average calculation, it is not necessary to perform inhomogeneous dose calculations for the trail user scenarios.

Review of the results for the trail user scenarios shows that estimated doses are far less than the value estimated for the extended backyard scenario (less than 2 mrem/year). The trail user scenarios employ very protective assumptions of 10 or 20 minutes time daily directly on the contaminated sediments. In reality, the trail crosses only about a 3 m width of contaminated sediments and the remainder of the trail is away from the sediments. The concentration of isotopic plutonium on the trail away from the sediments is extremely low, as shown by analysis of samples collected from the trail (see Appendix D). A more realistic, but still conservative, estimate of the exposure time to the contaminated sediments would be a minute per day for the hiker. Because dose scales directly with exposure time, a better estimate of the trail user dose is less than 0.1 mrem/year (or 1.5/20), which is more relevant to the current population of hikers and joggers using Acid Canyon.

Table 9
Modifications to the RESRAD Inputs for the Extended Backyard Scenario Inhomogeneous Contamination Dose Calculations

SRSG calculation scenario	Area (m^2)	Exposure time (hours/year)	Occupancy (unitless fraction)
Generic	10,000	200	0.0228
ACS Base Condition (Bin 1)	1,100	200	0.0228
ACS Bin 2	1,100	114	0.0130
ACS Bin 3	1,100	9.1	0.00104

Table 10
Calculation of Average Concentration in c1/c1b

	Geomorphic Unit		
	c1/ coarse	c1b/ fine	Total
Area (m2)	402	21	423
Fraction of Total Area	0.950	0.050	1.0

	Radionuclide Average Concentration in Geomorphic Unit (pCi/g)		
Radionuclide	c1/ coarse	c1b/ fine	c1/c1b weighted average (pCi/g)
Am-241	0.19	0.19	0.19
Cs-137	0.16	0.12	0.16
H-3	0.0069	0.0048	0.01
Pu-238	0.058	0.12	0.06
Pu-239,240	18.6	26	19.0
Sr-90	0.55	0.38	0.54
U-234	0.65	1.27	0.68
U-235	0.035	0.076	0.04
U-238	0.54	1.00	0.56

Table 11
Acid Canyon Estimated Dose for Extended Backyard Scenario
Based on Inhomogeneous Contamination Calculations

Radionuclide	c1/c1b weighted average (pCi/g)	ACS Base SRSG (pCi/g)	ACS Base Dose (mrem/yr)	Bin 2 average (pCi/g)	Adjusted Bin 2 Concentra-tion (pCi/g)	Bin 2 SRSG (pCi/g)	Bin 2 Dose (mrem/yr)	Bin 3 average (pCi/g)	Adjusted Bin 3 Concentra-tion (pCi/g)	Bin 3 SRSG (pCi/g)	Bin 3 Dose (mrem/yr)	Total Dose (mrem/yr)
Am-241	0.19	270	0.011	14.1	13.9	480	0.435	126	126	5900	0.320	0.760
Cs-137	0.16	220	0.011	12.4	12.2	380	0.483	8.2	8.0	4800	0.025	0.519
H-3	0.01	110000	0.000	0.9	0.9	120000	0.000	0.05	0.04	120000	0.000	0.000
Pu-238	0.06	310	0.003	0.8	0.8	550	0.020	10.6	10.5	6900	0.023	0.046
Pu-239,240	19.0	280	1.018	139	120	500	3.600	2740	2720	6200	6.581	11.199
Sr-90	0.54	5500	0.001	6.9	6.4	9700	0.010	59.7	59.2	120000	0.007	0.019
U-234	0.68	3100	0.003	3.8	3.2	5500	0.009	10.5	9.8	69000	0.002	0.014
U-235	0.04	740	0.001	0.3	0.3	1300	0.003	1.0	1.0	16000	0.001	0.005
U-238	0.56	2100	0.004	2.4	1.9	3600	0.008	7.1	6.5	45000	0.002	0.014
			1.1				**4.6**				**7.0**	**12.6**

Uncertainty Analysis

As described in previous sections of this report, the dose assessment incorporates numerous assumptions that are intended to simplify calculations and produce reasonably protective estimates (*i.e.*, "conservative" rather than "best" estimates) of potential human doses. The focus of this uncertainty analysis, therefore, is not to reiterate the intentional protective assumptions introduced in the calculations but instead to identify key uncertainties associated with the dose assessment framework underlying the calculations.

Three issues are particularly worthy of discussion. First is the application of dose conversion factors developed for adults to children envisioned as the exposed population in the extended backyard scenario. There are no data to estimate the dose conversion factors for children so this uncertainty must remain qualitative. However, because of their higher metabolism it can be surmised that children are more sensitive to the carcinogenic effects of ionizing radiation than are adults. Therefore, action may be warranted at lower dose environmental concentrations of radionuclides for children than for adults. It is also worthwhile noting that DOE Order 5400.5 specifies a total dose of 100 mrem/year to a member of the population, and evaluating risk relative to 15 mrem/year provides an added level of protection.

The second uncertainty is the adequacy of the characterization of the maximum and average concentration of radionuclides in Acid Canyon sediments. Data support is greatest for isotopic plutonium, and the laboratory data correlate with field alpha measurements that were used to refine the geomorphic units and select sample sites. Thus, maximum and average values for isotopic plutonium are supported by the field characterization that included detailed geomorphic mapping and extensive field radiation measurements. Information for other radionuclides is not as detailed, but other radionuclides contribute a small percentage to estimated dose and therefore uncertainty in the maximum and average values for other radionuclides are relatively unimportant and should not significantly affect estimated dose.

A third uncertainty is the application of the RESRAD model for assessing dose associated with a low-occupancy, non-residential scenario. Because of uncertainty in the spatial characteristics of potential receptor contact with contaminated sediments, the RESRAD model was used in a screening manner assuming a circular contaminated area and ignoring the fact that sediment packages are not all contiguous. The use of environmental and exposure information associated with exposure periods different from those being modeled (for example, annual average wind speed and daily soil ingestion rates applied to exposure periods of 10 minutes to one hour) also contributes to uncertainty in interpreting the results of the dose calculations. Although we did not perform a quantitative uncertainty analysis on these parameters it is highly likely that actual doses would be less than those calculated in this evaluation because upper end exposure assumptions were made for key parameters (like exposure time).

Conclusions

Maximum values for two radionuclides exceed the SRSGs for one or more exposure scenarios. Calculated dose based on average concentrations is less than 15 mrem/year for all scenarios, but concentrations in the most contaminated geomorphic units fail the "hot spot" criterion and indicated a need for further assessment. Application of inhomogeneous contamination calculations produces a realistic upper bound estimate of dose that is less than 15 mrem/year. Thus, the assessment shows that there is no immediate or unacceptable dose to recreational users of the South Fork of Acid Canyon from radionuclides in sediments within the scenarios evaluated.

Although the assessment shows doses that are below EPA-recommended limits, if remediation was desired for other reasons, then the "hot spot" criterion could provide one possible basis for selecting sites for cleanup. DOE is committed to protecting human health and the environment. DOE will evaluate reasonable alternative actions which could be taken to reduce contamination of sediments in the South Fork of Acid Canyon to further reduce doses to as low as reasonably achievable. Assessment of the risk from non-radionuclides, impacts on ecological receptors, and risk from contamination in surface water are pending further data analysis and interpretation.

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Appendix A
Summary of RESRAD Parameters for the Extended Backyard Scenario

Parameter	Value Selected	Notes
Dose conversion factors	Default	RESRAD contains current information on the dose conversion factors
Concentration ratios, food intake ratios, and bioconcentration factors	Not used	Food pathways were turned off
Area of contaminated zone (m**2)	10,000	Default value, maximizes exposure via soil ingestion and external gamma
Thickness of contaminated zone (m)	2	Default value, maximizes exposure via external gamma
Basic radiation dose limit (mrem/yr)	15	Based on EPA guidance
Time since placement of material (yr)	0	Default value, does not allow for any radiological decay
Initial concentrations of principal radionuclides	See Table 5 for values	Set to the weighted reach average value
Cover depth (m)	0	Default value, assumes exposure to surface geomorphic units
Density of contaminated zone (g/cm**3)	1.5	Default value, parameter is used in the tritium submodel
Physical parameters of the contaminated zone	Default	Transport is not being modeled
Evapotranspiration coefficient	0.999	Minimizes net infiltration and minimizes the tritium SRSG
Precipitation (m/yr)	0.35	Los Alamos value
Irrigation (m/yr)	0	Gardening pathway disabled
Watershed parameters	Not used	
Physical parameters of the saturated zone	Not used	Transport is not being modeled
Distribution coefficients	Not used	Transport is not being modeled
Inhalation rate (m**3/yr)	10,500	Assumes child respiration rate for moderate activity of 1.2 m**3/hr
Mass loading for inhalation (g/m**3)	0.0002	Agricultural value of 0.0002
Exposure duration (yr)	6	Assumes child 6-12 years old
Shielding factors	Not used	Parameter applies to indoor time fraction only
Fraction of time spent outdoors (on site)	0.0228	Assume 200 hours out of 8760 in a year
Shape factor flag, external gamma	Default value	For circular contaminated zone - will overestimate external dose for non-circular contaminated areas
Soil ingestion rate (g/yr)	626	After adjusting for occupancy this equals 14.3 g/yr
Depth of soil mixing layer (m)	Not used	Plant pathway is turned off
Storage times of contaminated foodstuffs (days)	Not used	Food pathways are turned off

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Dose Conversion Factor (and Related) Parameter Summary
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Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	H-3	6.400E-08	6.400E-08	DCF2(4)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(5)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(6)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(7)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(8)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(9)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(10)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(11)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(12)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(13)
B-1	U-233	1.350E-01	1.350E-01	DCF2(14)
B-1	U-234	1.320E-01	1.320E-01	DCF2(15)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(16)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(17)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	H-3	6.400E-08	6.400E-08	DCF3(4)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(5)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(6)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(7)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(8)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(9)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(10)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(11)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(12)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(13)
D-1	U-233	2.890E-04	2.890E-04	DCF3(14)
D-1	U-234	2.830E-04	2.830E-04	DCF3(15)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(16)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(17)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(4,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(4,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(5,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(7,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(7,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(7,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(8,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(8,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(17,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(17,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(4,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(4,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(5,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(6,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(7,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(8,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(17,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(17,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	3.000E+01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	not used	3.000E+00	---	T(3)
R011	Times for calculations (yr)	not used	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	1.380E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): H-3	5.300E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Pu-238	9.700E-01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Pu-239	2.110E+02	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Sr-90	6.860E+00	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): U-234	2.920E+00	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-235	2.500E-01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): U-238	1.920E+00	0.000E+00	---	S1(17)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(17)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	5.500E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	3.500E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.332E-08	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.000E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.097E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.624E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.321E-07	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.331E-06	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R017	Inhalation rate (m**3/yr)	1.050E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	6.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.280E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	6.260E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10000.00 square meters	Am-241	1.380E+01
Thickness:	2.00 meters	Cs-137	7.500E+00
Cover Depth:	0.00 meters	H-3	5.300E-01
		Pu-238	9.700E-01
		Pu-239	2.110E+02
		Sr-90	6.860E+00
		U-234	2.920E+00
		U-235	2.500E-01
		U-238	1.920E+00

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	3.000E+01
TDOSE(t):	1.272E+01	1.238E+01
M(t):	8.479E-01	8.253E-01

Maximum TDOSE(t): 1.272E+01 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.333E-02	0.0010	4.316E-02	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.164E-01	0.0563
Cs-137	5.395E-01	0.0424	1.667E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.291E-03	0.0004
H-3	0.000E+00	0.0000	2.076E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.395E-07	0.0000
Pu-238	3.294E-06	0.0000	2.670E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.413E-02	0.0035
Pu-239	1.363E-03	0.0001	6.382E-01	0.0502	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.066E+01	0.8382
Sr-90	3.802E-03	0.0003	6.261E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.480E-02	0.0012
U-234	2.594E-05	0.0000	2.717E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.179E-02	0.0009
U-235	4.108E-03	0.0003	2.168E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.531E-04	0.0001
U-238	5.656E-03	0.0004	1.597E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.372E-03	0.0006
Total	5.678E-01	0.0446	6.888E-01	0.0542	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.146E+01	0.9012

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.729E-01	0.0608
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.448E-01	0.0428
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.079E-04	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.680E-02	0.0037
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.130E+01	0.8885
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.867E-02	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.454E-02	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.278E-03	0.0004
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.462E-02	0.0011
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.272E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.271E-02	0.0010	4.113E-02	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.826E-01	0.0551
Cs-137	2.698E-01	0.0218	8.337E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.645E-03	0.0002
H-3	0.000E+00	0.0000	2.028E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.316E-17	0.0000
Pu-238	2.600E-06	0.0000	2.107E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.482E-02	0.0028
Pu-239	1.362E-03	0.0001	6.376E-01	0.0515	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.065E+01	0.8604
Sr-90	1.862E-03	0.0002	3.065E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.248E-03	0.0006
U-234	2.723E-05	0.0000	2.719E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.180E-02	0.0010
U-235	4.111E-03	0.0003	2.210E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.893E-04	0.0001
U-238	5.656E-03	0.0005	1.597E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.372E-03	0.0006
Total	2.955E-01	0.0239	6.854E-01	0.0554	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.140E+01	0.9208

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.365E-01	0.0595
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.724E-01	0.0220
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.031E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.693E-02	0.0030
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.129E+01	0.9120
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.140E-03	0.0007
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.455E-02	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.321E-03	0.0004
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.462E-02	0.0012
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.238E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) t= 0.000E+00	(mrem/yr)/(pCi/g) 3.000E+01
Am-241	Am-241	1.000E+00	5.601E-02	5.337E-02
Am-241	Np-237	1.000E+00	0.000E+00	8.767E-07
Am-241	U-233	1.000E+00	0.000E+00	3.310E-12
Am-241	Th-229	1.000E+00	0.000E+00	6.699E-14
Am-241	äDSR(j)		5.601E-02	5.337E-02
Cs-137	Cs-137	1.000E+00	7.264E-02	3.632E-02
H-3	H-3	1.000E+00	3.923E-04	3.833E-14
Pu-238	Pu-238	1.000E+00	4.825E-02	3.807E-02
Pu-238	U-234	1.000E+00	0.000E+00	3.825E-07
Pu-238	Th-230	1.000E+00	0.000E+00	1.113E-10
Pu-238	Ra-226	1.000E+00	0.000E+00	1.275E-11
Pu-238	Pb-210	1.000E+00	0.000E+00	1.025E-12
Pu-238	äDSR(j)		4.825E-02	3.807E-02
Pu-239	Pu-239	1.000E+00	5.356E-02	5.351E-02
Pu-239	U-235	1.000E+00	0.000E+00	6.338E-10
Pu-239	Pa-231	1.000E+00	0.000E+00	1.593E-12
Pu-239	Ac-227	1.000E+00	0.000E+00	7.556E-13
Pu-239	äDSR(j)		5.356E-02	5.351E-02
Sr-90	Sr-90	1.000E+00	2.721E-03	1.332E-03
U-234	U-234	1.000E+00	4.979E-03	4.978E-03
U-234	Th-230	1.000E+00	0.000E+00	2.785E-06
U-234	Ra-226	1.000E+00	0.000E+00	4.686E-07
U-234	Pb-210	1.000E+00	0.000E+00	4.766E-08
U-234	äDSR(j)		4.979E-03	4.981E-03
U-235	U-235	1.000E+00	2.111E-02	2.111E-02
U-235	Pa-231	1.000E+00	0.000E+00	1.061E-04
U-235	Ac-227	1.000E+00	0.000E+00	7.017E-05
U-235	äDSR(j)		2.111E-02	2.128E-02
U-238	U-238	1.000E+00	7.617E-03	7.617E-03
U-238	U-234	1.000E+00	0.000E+00	4.304E-07
U-238	Th-230	1.000E+00	0.000E+00	1.204E-10
U-238	Ra-226	1.000E+00	0.000E+00	1.352E-11
U-238	Pb-210	1.000E+00	0.000E+00	1.076E-12
U-238	äDSR(j)		7.617E-03	7.617E-03

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter:
CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 15 mrem/yr

Nuclide (i)	t= 0.000E+00	3.000E+01
Am-241	2.678E+02	2.811E+02
Cs-137	2.065E+02	4.130E+02
H-3	3.823E+04	3.914E+14
Pu-238	3.109E+02	3.940E+02
Pu-239	2.801E+02	2.803E+02
Sr-90	5.512E+03	1.126E+04
U-234	3.013E+03	3.011E+03
U-235	7.105E+02	7.047E+02
U-238	1.969E+03	1.969E+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 = 0.000E+00 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	1.380E+01	0.000E+00	5.601E-02	2.678E+02	5.601E-02	2.678E+02
Cs-137	7.500E+00	0.000E+00	7.264E-02	2.065E+02	7.264E-02	2.065E+02
H-3	5.300E-01	0.000E+00	3.923E-04	3.823E+04	3.923E-04	3.823E+04
Pu-238	9.700E-01	0.000E+00	4.825E-02	3.109E+02	4.825E-02	3.109E+02
Pu-239	2.110E+02	0.000E+00	5.356E-02	2.801E+02	5.356E-02	2.801E+02
Sr-90	6.860E+00	0.000E+00	2.721E-03	5.512E+03	2.721E-03	5.512E+03
U-234	2.920E+00	3.000E+01	4.981E-03	3.011E+03	4.979E-03	3.013E+03
U-235	2.500E-01	3.000E+01	2.128E-02	7.047E+02	2.111E-02	7.105E+02
U-238	1.920E+00	0.000E+00	7.617E-03	1.969E+03	7.617E-03	1.969E+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	3.000E+01
Am-241	Am-241	1.000E+00	7.729E-01	7.365E-01
Np-237	Am-241	1.000E+00	2.031E-07	1.210E-05
U-233	Am-241	1.000E+00	1.663E-14	4.568E-11
Th-229	Am-241	1.000E+00	8.261E-18	9.245E-13
Cs-137	Cs-137	1.000E+00	5.448E-01	2.724E-01
H-3	H-3	1.000E+00	2.079E-04	2.031E-14
Pu-238	Pu-238	1.000E+00	4.680E-02	3.693E-02
U-234	Pu-238	1.000E+00	6.827E-09	3.710E-07
U-234	U-234	1.000E+00	1.454E-02	1.454E-02
U-234	U-238	1.000E+00	1.355E-08	8.265E-07
U-234	äDOSE(j):		1.454E-02	1.454E-02
Th-230	Pu-238	1.000E+00	4.178E-14	1.080E-10
Th-230	U-234	1.000E+00	1.334E-07	8.133E-06
Th-230	U-238	1.000E+00	8.286E-14	2.312E-10
Th-230	äDOSE(j):		1.334E-07	8.133E-06
Ra-226	Pu-238	1.000E+00	1.158E-16	1.236E-11
Ra-226	U-234	1.000E+00	4.925E-10	1.368E-06
Ra-226	U-238	1.000E+00	2.604E-16	2.597E-11
Ra-226	äDOSE(j):		4.925E-10	1.368E-06
Pb-210	Pu-238	1.000E+00	2.854E-19	9.943E-13
Pb-210	U-234	1.000E+00	1.525E-12	1.392E-07
Pb-210	U-238	1.000E+00	0.000E+00	2.067E-12
Pb-210	äDOSE(j):		1.525E-12	1.392E-07
Pu-239	Pu-239	1.000E+00	1.130E+01	1.129E+01
U-235	Pu-239	1.000E+00	2.193E-09	1.337E-07
U-235	U-235	1.000E+00	5.277E-03	5.277E-03
U-235	äDOSE(j):		5.277E-03	5.277E-03
Pa-231	Pu-239	1.000E+00	1.205E-13	3.362E-10
Pa-231	U-235	1.000E+00	4.349E-07	2.652E-05
Pa-231	äDOSE(j):		4.349E-07	2.652E-05
Ac-227	Pu-239	1.000E+00	1.749E-15	1.594E-10
Ac-227	U-235	1.000E+00	8.409E-09	1.754E-05
Ac-227	äDOSE(j):		8.409E-09	1.754E-05
Sr-90	Sr-90	1.000E+00	1.867E-02	9.140E-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	3.000E+01
U-238	U-238	1.000E+00	1.462E-02	1.462E-02

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	3.000E+01
Am-241	Am-241	1.000E+00	1.380E+01	1.315E+01
Np-237	Am-241	1.000E+00	0.000E+00	1.309E-04
U-233	Am-241	1.000E+00	0.000E+00	8.656E-09
Th-229	Am-241	1.000E+00	0.000E+00	8.201E-12
Cs-137	Cs-137	1.000E+00	7.500E+00	3.750E+00
H-3	H-3	1.000E+00	5.300E-01	5.226E-11
Pu-238	Pu-238	1.000E+00	9.700E-01	7.653E-01
U-234	Pu-238	1.000E+00	0.000E+00	7.344E-05
U-234	U-234	1.000E+00	2.920E+00	2.920E+00
U-234	U-238	1.000E+00	0.000E+00	1.633E-04
U-234	äS(j):		2.920E+00	2.920E+00
Th-230	Pu-238	1.000E+00	0.000E+00	1.031E-08
Th-230	U-234	1.000E+00	0.000E+00	7.884E-04
Th-230	U-238	1.000E+00	0.000E+00	2.205E-08
Th-230	äS(j):		0.000E+00	7.884E-04
Ra-226	Pu-238	1.000E+00	0.000E+00	4.537E-11
Ra-226	U-234	1.000E+00	0.000E+00	5.101E-06
Ra-226	U-238	1.000E+00	0.000E+00	9.520E-11
Ra-226	äS(j):		0.000E+00	5.102E-06
Pb-210	Pu-238	1.000E+00	0.000E+00	8.972E-12
Pb-210	U-234	1.000E+00	0.000E+00	1.277E-06
Pb-210	U-238	1.000E+00	0.000E+00	1.863E-11
Pb-210	äS(j):		0.000E+00	1.277E-06
Pu-239	Pu-239	1.000E+00	2.110E+02	2.108E+02
U-235	Pu-239	1.000E+00	0.000E+00	6.231E-06
U-235	U-235	1.000E+00	2.500E-01	2.500E-01
U-235	äS(j):		2.500E-01	2.500E-01
Pa-231	Pu-239	1.000E+00	0.000E+00	1.978E-09
Pa-231	U-235	1.000E+00	0.000E+00	1.586E-04
Pa-231	äS(j):		0.000E+00	1.586E-04
Ac-227	Pu-239	1.000E+00	0.000E+00	5.040E-10
Ac-227	U-235	1.000E+00	0.000E+00	5.645E-05
Ac-227	äS(j):		0.000E+00	5.645E-05
Sr-90	Sr-90	1.000E+00	6.860E+00	3.359E+00

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	3.000E+01
U-238	U-238	1.000E+00	1.920E+00	1.920E+00

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

RESMAIN5.EXE execution time = 83.39 seconds

Appendix B
Summary of RESRAD Parameters for the Trail User [Jogger] Scenario

Parameter	Value Selected	Notes
Dose conversion factors	Default	RESRAD contains current information on the dose conversion factors
Concentration ratios, food intake ratios, and bioconcentration factors	Not used	Food pathways were turned off
Area of contaminated zone (m**2)	10,000	Default value, maximizes exposure via soil ingestion and external gamma
Thickness of contaminated zone (m)	2	Default value, maximizes exposure via external gamma
Basic radiation dose limit (mrem/yr)	15	Based on EPA guidance
Time since placement of material (yr)	0	Default value, does not allow for any radiological decay
Initial concentrations of principal radionuclides	See Table 6 for values	Set to the weighted reach average value
Cover depth (m)	0	Default value, assumes exposure to surface geomorphic units
Density of contaminated zone (g/cm**3)	1.5	Default value, parameter is used in the tritium submodel
Physical parameters of the contaminated zone	Default	Transport is not being modeled
Evapotranspiration coefficient	0.999	Minimizes net infiltration and minimizes the tritium SRSG
Precipitation (m/yr)	0.35	Los Alamos value
Irrigation (m/yr)	0	Gardening pathway disabled
Watershed parameters	Not used	
Physical parameters of the saturated zone	Not used	Transport is not being modeled
Distribution coefficients	Not used	Transport is not being modeled
Inhalation rate (m**3/yr)	14,000	Assumes adult respiration rate for heavy activity of 3.2 m**3/hr - because maximum value is 20,000, mass loading was doubling and this input was halved
Mass loading for inhalation (g/m**3)	0.0004	Agricultural value of 0.0002 was doubled to account for constraint on maximum inhalation rate
Exposure duration (yr)	30	Assumes adult averaging time
Shielding factors	Not used	Parameter applies to indoor time fraction only
Fraction of time spent outdoors (on site)	0.00381	Assume 33 and 1/3rd hours out of 8760 in a year
Shape factor flag, external gamma	Default value	For circular contaminated zone - will overestimate external dose for non-circular contaminated areas
Soil ingestion rate (g/yr)	584	After adjusting for occupancy this equals 2.22 g/yr
Depth of soil mixing layer (m)	Not used	Plant pathway is turned off
Storage times of contaminated foodstuffs (days)	Not used	Food pathways are turned off

Summary : Trail User, Jogger, 33 hrs/yr, 67 mg/hr soil ingestion
File : TUJ.RAD

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Dose Conversion Factor (and Related) Parameter Summary
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	H-3	6.400E-08	6.400E-08	DCF2(4)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(5)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(6)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(7)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(8)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(9)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(10)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(11)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(12)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(13)
B-1	U-233	1.350E-01	1.350E-01	DCF2(14)
B-1	U-234	1.320E-01	1.320E-01	DCF2(15)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(16)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(17)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	H-3	6.400E-08	6.400E-08	DCF3(4)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(5)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(6)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(7)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(8)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(9)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(10)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(11)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(12)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(13)
D-1	U-233	2.890E-04	2.890E-04	DCF3(14)
D-1	U-234	2.830E-04	2.830E-04	DCF3(15)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(16)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(17)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(4,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(4,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(5,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(7,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(7,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(7,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(8,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(8,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(17,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(17,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(4,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(4,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(5,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(6,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(7,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(8,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(17,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(17,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	3.000E+01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	not used	3.000E+00	---	T(3)
R011	Times for calculations (yr)	not used	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	7.100E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	6.300E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): H-3	5.000E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Pu-238	4.000E-01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Pu-239	7.880E+01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.700E+00	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): U-234	2.200E+00	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-235	2.000E-01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+00	0.000E+00	---	S1(17)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(17)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	5.500E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	3.500E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.332E-08	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.000E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.097E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.624E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.321E-07	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.331E-06	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R017	Inhalation rate (m**3/yr)	1.400E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	4.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	3.810E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	5.840E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	10000.00 square meters
Thickness:	2.00 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
Am-241	7.100E+00
Cs-137	6.300E+00
H-3	5.000E-01
Pu-238	4.000E-01
Pu-239	7.880E+01
Sr-90	3.700E+00
U-234	2.200E+00
U-235	2.000E-01
U-238	1.500E+00

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	3.000E+01
TDOSE(t):	8.823E-01	8.385E-01
M(t):	5.882E-02	5.590E-02

Maximum TDOSE(t): 8.823E-01 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.146E-03	0.0013	9.896E-03	0.0112	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.746E-02	0.0651
Cs-137	7.573E-02	0.0858	6.241E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.929E-04	0.0008
H-3	0.000E+00	0.0000	2.611E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.993E-08	0.0000
Pu-238	2.270E-07	0.0000	4.907E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.837E-03	0.0032
Pu-239	8.505E-05	0.0001	1.062E-01	0.1204	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.207E-01	0.7035
Sr-90	3.427E-04	0.0004	1.505E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.245E-03	0.0014
U-234	3.266E-06	0.0000	9.123E-04	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.385E-03	0.0016
U-235	5.492E-04	0.0006	7.729E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-04	0.0001
U-238	7.384E-04	0.0008	5.561E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.978E-04	0.0010
Total	7.860E-02	0.0891	1.184E-01	0.1342	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.853E-01	0.7767

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.850E-02	0.0776
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.643E-02	0.0866
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.612E-04	0.0003
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.328E-03	0.0038
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.270E-01	0.8239
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.602E-03	0.0018
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.301E-03	0.0026
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.453E-04	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.192E-03	0.0025
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.823E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.093E-03	0.0013	9.430E-03	0.0112	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.475E-02	0.0653
Cs-137	3.787E-02	0.0452	3.121E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.464E-04	0.0004
H-3	0.000E+00	0.0000	2.551E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.877E-18	0.0000
Pu-238	1.791E-07	0.0000	3.871E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.238E-03	0.0027
Pu-239	8.498E-05	0.0001	1.061E-01	0.1266	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.201E-01	0.7396
Sr-90	1.678E-04	0.0002	7.367E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.094E-04	0.0007
U-234	3.428E-06	0.0000	9.128E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.386E-03	0.0017
U-235	5.496E-04	0.0007	7.878E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.234E-04	0.0001
U-238	7.383E-04	0.0009	5.561E-04	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.978E-04	0.0011
Total	4.050E-02	0.0483	1.175E-01	0.1401	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.805E-01	0.8116

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.527E-02	0.0778
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.821E-02	0.0456
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.551E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.626E-03	0.0031
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.263E-01	0.8663
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.845E-04	0.0009
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.302E-03	0.0027
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.517E-04	0.0009
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.192E-03	0.0026
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.385E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) t= 0.000E+00	(mrem/yr)/(pCi/g) 3.000E+01
Am-241	Am-241	1.000E+00	9.648E-03	9.193E-03
Am-241	Np-237	1.000E+00	0.000E+00	1.499E-07
Am-241	U-233	1.000E+00	0.000E+00	6.950E-13
Am-241	Th-229	1.000E+00	0.000E+00	1.344E-14
Am-241	äDSR(j)		9.648E-03	9.194E-03
Cs-137	Cs-137	1.000E+00	1.213E-02	6.066E-03
H-3	H-3	1.000E+00	5.224E-04	5.103E-14
Pu-238	Pu-238	1.000E+00	8.319E-03	6.564E-03
Pu-238	U-234	1.000E+00	0.000E+00	8.036E-08
Pu-238	Th-230	1.000E+00	0.000E+00	2.466E-11
Pu-238	Ra-226	1.000E+00	0.000E+00	2.121E-12
Pu-238	Pb-210	1.000E+00	0.000E+00	1.603E-13
Pu-238	äDSR(j)		8.319E-03	6.564E-03
Pu-239	Pu-239	1.000E+00	9.225E-03	9.217E-03
Pu-239	U-235	1.000E+00	0.000E+00	1.119E-10
Pu-239	Pa-231	1.000E+00	0.000E+00	2.741E-13
Pu-239	Ac-227	1.000E+00	0.000E+00	1.533E-13
Pu-239	äDSR(j)		9.225E-03	9.217E-03
Sr-90	Sr-90	1.000E+00	4.331E-04	2.120E-04
U-234	U-234	1.000E+00	1.046E-03	1.046E-03
U-234	Th-230	1.000E+00	0.000E+00	6.171E-07
U-234	Ra-226	1.000E+00	0.000E+00	7.796E-08
U-234	Pb-210	1.000E+00	0.000E+00	7.452E-09
U-234	äDSR(j)		1.046E-03	1.046E-03
U-235	U-235	1.000E+00	3.726E-03	3.726E-03
U-235	Pa-231	1.000E+00	0.000E+00	1.825E-05
U-235	Ac-227	1.000E+00	0.000E+00	1.424E-05
U-235	äDSR(j)		3.726E-03	3.759E-03
U-238	U-238	1.000E+00	1.462E-03	1.461E-03
U-238	U-234	1.000E+00	0.000E+00	9.042E-08
U-238	Th-230	1.000E+00	0.000E+00	2.668E-11
U-238	Ra-226	1.000E+00	0.000E+00	2.250E-12
U-238	Pb-210	1.000E+00	0.000E+00	1.683E-13
U-238	äDSR(j)		1.462E-03	1.462E-03

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter:
CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 15 mrem/yr

Nuclide (i)	t= 0.000E+00	3.000E+01
Am-241	1.555E+03	1.632E+03
Cs-137	1.236E+03	2.473E+03
H-3	2.872E+04	2.939E+14
Pu-238	1.803E+03	2.285E+03
Pu-239	1.626E+03	1.627E+03
Sr-90	3.463E+04	7.074E+04
U-234	1.434E+04	1.433E+04
U-235	4.025E+03	3.991E+03
U-238	1.026E+04	1.026E+04

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

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	7.100E+00	0.000E+00	9.648E-03	1.555E+03	9.648E-03	1.555E+03
Cs-137	6.300E+00	0.000E+00	1.213E-02	1.236E+03	1.213E-02	1.236E+03
H-3	5.000E-01	0.000E+00	5.224E-04	2.872E+04	5.224E-04	2.872E+04
Pu-238	4.000E-01	0.000E+00	8.319E-03	1.803E+03	8.319E-03	1.803E+03
Pu-239	7.880E+01	0.000E+00	9.225E-03	1.626E+03	9.225E-03	1.626E+03
Sr-90	3.700E+00	0.000E+00	4.331E-04	3.463E+04	4.331E-04	3.463E+04
U-234	2.200E+00	3.000E+01	1.046E-03	1.433E+04	1.046E-03	1.434E+04
U-235	2.000E-01	3.000E+01	3.759E-03	3.991E+03	3.727E-03	4.025E+03
U-238	1.500E+00	3.000E+01	1.462E-03	1.026E+04	1.462E-03	1.026E+04

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	3.000E+01
Am-241	Am-241	1.000E+00	6.850E-02	6.527E-02
Np-237	Am-241	1.000E+00	1.787E-08	1.064E-06
U-233	Am-241	1.000E+00	1.797E-15	4.935E-12
Th-229	Am-241	1.000E+00	8.527E-19	9.543E-14
Cs-137	Cs-137	1.000E+00	7.643E-02	3.821E-02
H-3	H-3	1.000E+00	2.612E-04	2.551E-14
Pu-238	Pu-238	1.000E+00	3.328E-03	2.626E-03
U-234	Pu-238	1.000E+00	5.914E-10	3.214E-08
U-234	U-234	1.000E+00	2.301E-03	2.301E-03
U-234	U-238	1.000E+00	2.224E-09	1.356E-07
U-234	äDOSE(j):		2.301E-03	2.301E-03
Th-230	Pu-238	1.000E+00	3.817E-15	9.864E-12
Th-230	U-234	1.000E+00	2.226E-08	1.358E-06
Th-230	U-238	1.000E+00	1.434E-14	4.002E-11
Th-230	äDOSE(j):		2.226E-08	1.358E-06
Ra-226	Pu-238	1.000E+00	7.941E-18	8.482E-13
Ra-226	U-234	1.000E+00	6.172E-11	1.715E-07
Ra-226	U-238	1.000E+00	3.384E-17	3.375E-12
Ra-226	äDOSE(j):		6.172E-11	1.715E-07
Pb-210	Pu-238	1.000E+00	1.841E-20	6.411E-14
Pb-210	U-234	1.000E+00	1.797E-13	1.640E-08
Pb-210	U-238	1.000E+00	0.000E+00	2.525E-13
Pb-210	äDOSE(j):		1.797E-13	1.640E-08
Pu-239	Pu-239	1.000E+00	7.270E-01	7.263E-01
U-235	Pu-239	1.000E+00	1.446E-10	8.816E-09
U-235	U-235	1.000E+00	7.453E-04	7.452E-04
U-235	äDOSE(j):		7.453E-04	7.452E-04
Pa-231	Pu-239	1.000E+00	7.744E-15	2.160E-11
Pa-231	U-235	1.000E+00	5.987E-08	3.651E-06
Pa-231	äDOSE(j):		5.987E-08	3.651E-06
Ac-227	Pu-239	1.000E+00	1.326E-16	1.208E-11
Ac-227	U-235	1.000E+00	1.365E-09	2.848E-06
Ac-227	äDOSE(j):		1.365E-09	2.848E-06
Sr-90	Sr-90	1.000E+00	1.602E-03	7.845E-04

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	3.000E+01
U-238	U-238	1.000E+00	2.192E-03	2.192E-03

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	3.000E+01
Am-241	Am-241	1.000E+00	7.100E+00	6.766E+00
Np-237	Am-241	1.000E+00	0.000E+00	6.735E-05
U-233	Am-241	1.000E+00	0.000E+00	4.453E-09
Th-229	Am-241	1.000E+00	0.000E+00	4.219E-12
Cs-137	Cs-137	1.000E+00	6.300E+00	3.150E+00
H-3	H-3	1.000E+00	5.000E-01	4.930E-11
Pu-238	Pu-238	1.000E+00	4.000E-01	3.156E-01
U-234	Pu-238	1.000E+00	0.000E+00	3.029E-05
U-234	U-234	1.000E+00	2.200E+00	2.200E+00
U-234	U-238	1.000E+00	0.000E+00	1.276E-04
U-234	äS(j):		2.200E+00	2.200E+00
Th-230	Pu-238	1.000E+00	0.000E+00	4.251E-09
Th-230	U-234	1.000E+00	0.000E+00	5.940E-04
Th-230	U-238	1.000E+00	0.000E+00	1.722E-08
Th-230	äS(j):		0.000E+00	5.940E-04
Ra-226	Pu-238	1.000E+00	0.000E+00	1.871E-11
Ra-226	U-234	1.000E+00	0.000E+00	3.844E-06
Ra-226	U-238	1.000E+00	0.000E+00	7.437E-11
Ra-226	äS(j):		0.000E+00	3.844E-06
Pb-210	Pu-238	1.000E+00	0.000E+00	3.700E-12
Pb-210	U-234	1.000E+00	0.000E+00	9.619E-07
Pb-210	U-238	1.000E+00	0.000E+00	1.456E-11
Pb-210	äS(j):		0.000E+00	9.620E-07
Pu-239	Pu-239	1.000E+00	7.880E+01	7.873E+01
U-235	Pu-239	1.000E+00	0.000E+00	2.327E-06
U-235	U-235	1.000E+00	2.000E-01	2.000E-01
U-235	äS(j):		2.000E-01	2.000E-01
Pa-231	Pu-239	1.000E+00	0.000E+00	7.385E-10
Pa-231	U-235	1.000E+00	0.000E+00	1.269E-04
Pa-231	äS(j):		0.000E+00	1.269E-04
Ac-227	Pu-239	1.000E+00	0.000E+00	1.882E-10
Ac-227	U-235	1.000E+00	0.000E+00	4.516E-05
Ac-227	äS(j):		0.000E+00	4.516E-05
Sr-90	Sr-90	1.000E+00	3.700E+00	1.811E+00

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	3.000E+01
U-238	U-238	1.000E+00	1.500E+00	1.500E+00

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

RESMAIN5.EXE execution time = 386.66 seconds

Appendix C
Summary of RESRAD Parameters for the Trail User [Hiker] Scenario

Parameter	Value Selected	Notes
Dose conversion factors	Default	RESRAD contains current information on the dose conversion factors
Concentration ratios, food intake ratios, and bioconcentration factors	Not used	Food pathways were turned off
Area of contaminated zone (m**2)	10,000	Default value, maximizes exposure via soil ingestion and external gamma
Thickness of contaminated zone (m)	2	Default value, maximizes exposure via external gamma
Basic radiation dose limit (mrem/yr)	15	Based on EPA guidance
Time since placement of material (yr)	0	Default value, does not allow for any radiological decay
Initial concentrations of principal radionuclides	See Table 7 for values	Set to the weighted reach average value
Cover depth (m)	0	Default value, assumes exposure to surface geomorphic units
Density of contaminated zone (g/cm**3)	1.5	Default value, parameter is used in the tritium submodel
Physical parameters of the contaminated zone	Default	Transport is not being modeled
Evapotranspiration coefficient	0.999	Minimizes net infiltration and minimizes the tritium SRSG
Precipitation (m/yr)	0.35	Los Alamos value
Irrigation (m/yr)	0	Gardening pathway disabled
Watershed parameters	Not used	
Physical parameters of the saturated zone	Not used	Transport is not being modeled
Distribution coefficients	Not used	Transport is not being modeled
Inhalation rate (m**3/yr)	14,000	Assumes adult respiration rate for moderate activity of 1.6 m**3/hr
Mass loading for inhalation (g/m**3)	0.00002	Measured value from Laboratory Environmental Surveillance reports
Exposure duration (yr)	30	Assumes adult averaging time
Shielding factors	Not used	No residences on site
Fraction of time spent outdoors (on site)	0.00761	Assume 66.7 hours out of 8760 in a year
Shape factor flag, external gamma	Default value	For circular contaminated zone - will overestimate external dose for non-circular contaminated areas
Soil ingestion rate (g/yr)	584	After adjusting for occupancy this equals 4.44 g/yr
Depth of soil mixing layer (m)	Not used	Plant pathway is turned off
Storage times of contaminated foodstuffs (days)	Not used	Food pathways are turned off

Summary : Trail User, Hiker, 67 hrs/yr, 67 mg/hr soil ingestion
File : TUH.RAD

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Dose Conversion Factor (and Related) Parameter Summary
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	H-3	6.400E-08	6.400E-08	DCF2(4)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(5)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(6)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(7)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(8)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(9)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(10)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(11)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(12)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(13)
B-1	U-233	1.350E-01	1.350E-01	DCF2(14)
B-1	U-234	1.320E-01	1.320E-01	DCF2(15)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(16)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(17)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	H-3	6.400E-08	6.400E-08	DCF3(4)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(5)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(6)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(7)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(8)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(9)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(10)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(11)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(12)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(13)
D-1	U-233	2.890E-04	2.890E-04	DCF3(14)
D-1	U-234	2.830E-04	2.830E-04	DCF3(15)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(16)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(17)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(4,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(4,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(5,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(7,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(7,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(7,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(8,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(8,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(17,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(17,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D ; crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(4,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(4,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(5,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(6,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(7,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(8,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(17,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(17,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	3.000E+01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	not used	3.000E+00	---	T(3)
R011	Times for calculations (yr)	not used	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	7.100E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	6.300E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): H-3	5.000E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Pu-238	4.000E-01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Pu-239	7.880E+01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Sr-90	3.700E+00	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): U-234	2.200E+00	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-235	2.000E-01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+00	0.000E+00	---	S1(17)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(17)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	5.500E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	3.500E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.332E-08	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.000E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.097E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.624E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.321E-07	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.331E-06	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R017	Inhalation rate (m**3/yr)	1.400E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-05	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	7.610E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	5.840E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10000.00 square meters	Am-241	7.100E+00
Thickness:	2.00 meters	Cs-137	6.300E+00
Cover Depth:	0.00 meters	H-3	5.000E-01
		Pu-238	4.000E-01
		Pu-239	7.880E+01
		Sr-90	3.700E+00
		U-234	2.200E+00
		U-235	2.000E-01
		U-238	1.500E+00

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	3.000E+01
TDOSE(t):	1.538E+00	1.452E+00
M(t):	1.025E-01	9.679E-02

Maximum TDOSE(t): 1.538E+00 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.289E-03	0.0015	9.883E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.148E-01	0.0746
Cs-137	1.513E-01	0.0984	6.233E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.384E-03	0.0009
H-3	0.000E+00	0.0000	2.611E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.972E-08	0.0000
Pu-238	4.534E-07	0.0000	4.900E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.666E-03	0.0037
Pu-239	1.699E-04	0.0001	1.061E-02	0.0069	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E+00	0.8061
Sr-90	6.845E-04	0.0004	1.503E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.486E-03	0.0016
U-234	6.524E-06	0.0000	9.111E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.767E-03	0.0018
U-235	1.097E-03	0.0007	7.719E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.374E-04	0.0002
U-238	1.475E-03	0.0010	5.553E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.793E-03	0.0012
Total	1.570E-01	0.1021	1.206E-02	0.0078	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.369E+00	0.8901

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.180E-01	0.0768
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-01	0.0993
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.612E-04	0.0002
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.716E-03	0.0037
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E+00	0.8131
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.172E-03	0.0021
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.865E-03	0.0019
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.342E-03	0.0009
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.324E-03	0.0022
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.538E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.182E-03	0.0015	9.417E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.094E-01	0.0753
Cs-137	7.563E-02	0.0521	3.117E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.919E-04	0.0005
H-3	0.000E+00	0.0000	2.551E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.741E-18	0.0000
Pu-238	3.578E-07	0.0000	3.866E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.471E-03	0.0031
Pu-239	1.697E-04	0.0001	1.060E-02	0.0073	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.239E+00	0.8532
Sr-90	3.351E-04	0.0002	7.357E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.217E-03	0.0008
U-234	6.847E-06	0.0000	9.116E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.768E-03	0.0019
U-235	1.098E-03	0.0008	7.868E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.464E-04	0.0002
U-238	1.475E-03	0.0010	5.554E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.793E-03	0.0012
Total	8.090E-02	0.0557	1.173E-02	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E+00	0.9362

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.125E-01	0.0775
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.633E-02	0.0526
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.552E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.510E-03	0.0031
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E+00	0.8606
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.553E-03	0.0011
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.866E-03	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.352E-03	0.0009
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.324E-03	0.0023
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.452E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	3.000E+01
Am-241	Am-241	1.000E+00	1.663E-02	1.584E-02
Am-241	Np-237	1.000E+00	0.000E+00	2.683E-07
Am-241	U-233	1.000E+00	0.000E+00	8.666E-13
Am-241	Th-229	1.000E+00	0.000E+00	1.881E-14
Am-241	äDSR(j)		1.663E-02	1.584E-02
Cs-137	Cs-137	1.000E+00	2.423E-02	1.212E-02
H-3	H-3	1.000E+00	5.225E-04	5.104E-14
Pu-238	Pu-238	1.000E+00	1.429E-02	1.127E-02
Pu-238	U-234	1.000E+00	0.000E+00	1.000E-07
Pu-238	Th-230	1.000E+00	0.000E+00	2.794E-11
Pu-238	Ra-226	1.000E+00	0.000E+00	4.233E-12
Pu-238	Pb-210	1.000E+00	0.000E+00	3.188E-13
Pu-238	äDSR(j)		1.429E-02	1.127E-02
Pu-239	Pu-239	1.000E+00	1.587E-02	1.586E-02
Pu-239	U-235	1.000E+00	0.000E+00	2.015E-10
Pu-239	Pa-231	1.000E+00	0.000E+00	4.737E-13
Pu-239	Ac-227	1.000E+00	0.000E+00	2.061E-13
Pu-239	äDSR(j)		1.587E-02	1.586E-02
Sr-90	Sr-90	1.000E+00	8.573E-04	4.197E-04
U-234	U-234	1.000E+00	1.302E-03	1.302E-03
U-234	Th-230	1.000E+00	0.000E+00	6.990E-07
U-234	Ra-226	1.000E+00	0.000E+00	1.556E-07
U-234	Pb-210	1.000E+00	0.000E+00	1.482E-08
U-234	äDSR(j)		1.302E-03	1.303E-03
U-235	U-235	1.000E+00	6.710E-03	6.709E-03
U-235	Pa-231	1.000E+00	0.000E+00	3.154E-05
U-235	Ac-227	1.000E+00	0.000E+00	1.914E-05
U-235	äDSR(j)		6.710E-03	6.760E-03
U-238	U-238	1.000E+00	2.216E-03	2.216E-03
U-238	U-234	1.000E+00	0.000E+00	1.126E-07
U-238	Th-230	1.000E+00	0.000E+00	3.023E-11
U-238	Ra-226	1.000E+00	0.000E+00	4.491E-12
U-238	Pb-210	1.000E+00	0.000E+00	3.347E-13
U-238	äDSR(j)		2.216E-03	2.216E-03

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter:
CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 15 mrem/yr

Nuclide (i)	t= 0.000E+00	3.000E+01
Am-241	9.022E+02	9.468E+02
Cs-137	6.190E+02	1.238E+03
H-3	2.871E+04	2.939E+14
Pu-238	1.050E+03	1.330E+03
Pu-239	9.452E+02	9.460E+02
Sr-90	1.750E+04	3.574E+04
U-234	1.152E+04	1.151E+04
U-235	2.235E+03	2.219E+03
U-238	6.770E+03	6.770E+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 = 0.000E+00 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	7.100E+00	0.000E+00	1.663E-02	9.022E+02	1.663E-02	9.022E+02
Cs-137	6.300E+00	0.000E+00	2.423E-02	6.190E+02	2.423E-02	6.190E+02
H-3	5.000E-01	0.000E+00	5.225E-04	2.871E+04	5.225E-04	2.871E+04
Pu-238	4.000E-01	0.000E+00	1.429E-02	1.050E+03	1.429E-02	1.050E+03
Pu-239	7.880E+01	0.000E+00	1.587E-02	9.452E+02	1.587E-02	9.452E+02
Sr-90	3.700E+00	0.000E+00	8.573E-04	1.750E+04	8.573E-04	1.750E+04
U-234	2.200E+00	3.000E+01	1.303E-03	1.151E+04	1.302E-03	1.152E+04
U-235	2.000E-01	3.000E+01	6.760E-03	2.219E+03	6.710E-03	2.235E+03
U-238	1.500E+00	0.000E+00	2.216E-03	6.770E+03	2.216E-03	6.770E+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	3.000E+01
Am-241	Am-241	1.000E+00	1.180E-01	1.125E-01
Np-237	Am-241	1.000E+00	3.199E-08	1.905E-06
U-233	Am-241	1.000E+00	2.240E-15	6.153E-12
Th-229	Am-241	1.000E+00	1.193E-18	1.335E-13
Cs-137	Cs-137	1.000E+00	1.527E-01	7.633E-02
H-3	H-3	1.000E+00	2.612E-04	2.552E-14
Pu-238	Pu-238	1.000E+00	5.716E-03	4.510E-03
U-234	Pu-238	1.000E+00	7.363E-10	4.002E-08
U-234	U-234	1.000E+00	2.865E-03	2.864E-03
U-234	U-238	1.000E+00	2.769E-09	1.689E-07
U-234	äDOSE(j):		2.865E-03	2.864E-03
Th-230	Pu-238	1.000E+00	4.324E-15	1.118E-11
Th-230	U-234	1.000E+00	2.522E-08	1.538E-06
Th-230	U-238	1.000E+00	1.625E-14	4.534E-11
Th-230	äDOSE(j):		2.522E-08	1.538E-06
Ra-226	Pu-238	1.000E+00	1.585E-17	1.693E-12
Ra-226	U-234	1.000E+00	1.232E-10	3.424E-07
Ra-226	U-238	1.000E+00	6.755E-17	6.737E-12
Ra-226	äDOSE(j):		1.232E-10	3.424E-07
Pb-210	Pu-238	1.000E+00	3.661E-20	1.275E-13
Pb-210	U-234	1.000E+00	3.573E-13	3.261E-08
Pb-210	U-238	1.000E+00	0.000E+00	5.021E-13
Pb-210	äDOSE(j):		3.573E-13	3.261E-08
Pu-239	Pu-239	1.000E+00	1.250E+00	1.249E+00
U-235	Pu-239	1.000E+00	2.604E-10	1.587E-08
U-235	U-235	1.000E+00	1.342E-03	1.342E-03
U-235	äDOSE(j):		1.342E-03	1.342E-03
Pa-231	Pu-239	1.000E+00	1.338E-14	3.732E-11
Pa-231	U-235	1.000E+00	1.034E-07	6.308E-06
Pa-231	äDOSE(j):		1.034E-07	6.308E-06
Ac-227	Pu-239	1.000E+00	1.782E-16	1.624E-11
Ac-227	U-235	1.000E+00	1.835E-09	3.828E-06
Ac-227	äDOSE(j):		1.835E-09	3.828E-06
Sr-90	Sr-90	1.000E+00	3.172E-03	1.553E-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	3.000E+01
U-238	U-238	1.000E+00	3.324E-03	3.323E-03

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	3.000E+01
Am-241	Am-241	1.000E+00	7.100E+00	6.766E+00
Np-237	Am-241	1.000E+00	0.000E+00	6.735E-05
U-233	Am-241	1.000E+00	0.000E+00	4.453E-09
Th-229	Am-241	1.000E+00	0.000E+00	4.219E-12
Cs-137	Cs-137	1.000E+00	6.300E+00	3.150E+00
H-3	H-3	1.000E+00	5.000E-01	4.930E-11
Pu-238	Pu-238	1.000E+00	4.000E-01	3.156E-01
U-234	Pu-238	1.000E+00	0.000E+00	3.029E-05
U-234	U-234	1.000E+00	2.200E+00	2.200E+00
U-234	U-238	1.000E+00	0.000E+00	1.276E-04
U-234	äS(j):		2.200E+00	2.200E+00
Th-230	Pu-238	1.000E+00	0.000E+00	4.251E-09
Th-230	U-234	1.000E+00	0.000E+00	5.940E-04
Th-230	U-238	1.000E+00	0.000E+00	1.722E-08
Th-230	äS(j):		0.000E+00	5.940E-04
Ra-226	Pu-238	1.000E+00	0.000E+00	1.871E-11
Ra-226	U-234	1.000E+00	0.000E+00	3.844E-06
Ra-226	U-238	1.000E+00	0.000E+00	7.437E-11
Ra-226	äS(j):		0.000E+00	3.844E-06
Pb-210	Pu-238	1.000E+00	0.000E+00	3.700E-12
Pb-210	U-234	1.000E+00	0.000E+00	9.619E-07
Pb-210	U-238	1.000E+00	0.000E+00	1.456E-11
Pb-210	äS(j):		0.000E+00	9.620E-07
Pu-239	Pu-239	1.000E+00	7.880E+01	7.873E+01
U-235	Pu-239	1.000E+00	0.000E+00	2.327E-06
U-235	U-235	1.000E+00	2.000E-01	2.000E-01
U-235	äS(j):		2.000E-01	2.000E-01
Pa-231	Pu-239	1.000E+00	0.000E+00	7.385E-10
Pa-231	U-235	1.000E+00	0.000E+00	1.269E-04
Pa-231	äS(j):		0.000E+00	1.269E-04
Ac-227	Pu-239	1.000E+00	0.000E+00	1.882E-10
Ac-227	U-235	1.000E+00	0.000E+00	4.516E-05
Ac-227	äS(j):		0.000E+00	4.516E-05
Sr-90	Sr-90	1.000E+00	3.700E+00	1.811E+00

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	3.000E+01
U-238	U-238	1.000E+00	1.500E+00	1.500E+00

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

RESMAIN5.EXE execution time = 381.14 seconds

APPENDIX D – ANALYTICAL RESULTS

The following tables present the analytical sample results and data qualifiers applied to each analyte for a given sample. Data qualifiers are defined in Table D-1. Individual sample results and qualifiers for reach ACS data are presented in Table D-2.

Table D-1
Data Qualifiers for Data Validation Procedure

Qualifier	Explanation
U	Analyte was analyzed for but not detected. Reported value is the sample-specific estimated quantitation limit or detection limit. For radionuclide analyses, the reported value is the best estimate of the analyte concentration, even when that estimate is less than the detection limit. For statistical reasons, the estimates sometimes may be negative values.
J	Reported value should be regarded as estimated.
J+	Reported value should be regarded as estimated and biased high.
J-	Reported value should be regarded as estimated and biased low.
UJ	Analyte was analyzed for but not detected. Reported value is an estimate of the sample-specific quantitation limit or detection limit.
UJ+	Analyte was analyzed for but not detected. Reported value is an estimate of the sample-specific quantitation limit or reporting limit with a high bias.
UJ-	Analyte was analyzed for but not detected. Reported value is an estimate of the sample-specific quantitation limit or reporting limit with a low bias.
R	Sample results were rejected because of serious deficiencies in the ability to analyze the sample and meet QC criteria; presence or absence cannot be verified.

Table D-2

SAMPLE_ID	LOCATION_ID	Source	Geomorphic Unit	Sediment Facies	Start Depth (cm)	End Depth (cm)	Bin	Type	Gross-alpha (pCi/g)	Gross-beta (pCi/g)	Americium-241 (a-spec) (pCi/g)	Americium-241 (g-spec) (pCi/g)	Cesium-137 (pCi/g)	Tritium (pCi/g)	Plutonium-238 (pCi/g)	Plutonium-239 (pCi/g)	Uranium-234 (pCi/g)
CAPU-99-1005	PU-10000	ER-CFA	f1a	fine	39	49	3f	sample	.	.	.	64	-0.007 (U)	0.045 (U)	17.8	6780	21.5
CAPU-99-1006	PU-10002	ER-CFA	f1	fine	0	10	2f	sample	.	.	.	4.4	0.57	0.0058 (U)	0.46	94.2	4.63
CAPU-99-1007	PU-10003	ER-CFA	c3	fine	19	35	3f	sample	.	.	.	93	0.11 (U)	0.049 (U)	16.8	4990	5 (U)
CAPU-99-1008	PU-10005	ER-CFA	c2	fine	45	58	2f	sample	.	.	.	67	148	1.86	3.19	393	4.64
CAPU-99-1009	PU-10006	ER-CFA	c1b	fine	0	10	1f	sample	.	.	.	0.67 (R)	0.12 (U)	0.0048 (U)	0.12	26	1.27
CAPU-99-1010	PU-10010	ER-CFA	c1	coarse	0	20	1c	sample	.	.	.	0.38 (R)	0.25	0.0069 (U)	0.058 (U)	14.74	0.648
CAPU-99-1023	PU-10000	ER-CFA	f1a	fine	0	10	3f	sample	.	.	.	.	.	.	2 (U)	1002	.
CAPU-99-1024	PU-10000	ER-CFA	f1a	fine	14	29	3f	sample	.	.	.	.	.	.	37.3	7780	.
CAPU-99-1025	PU-10000	ER-CFA	f1a	coarse	29	39	3c	sample	.	.	.	.	.	.	4.5 (U)	1660	.
CAPU-99-1026	PU-10000	ER-CFA	f1a	coarse	58	86	3c	sample	.	.	.	.	.	.	0.91	234	.
CAPU-99-1027	PU-10001	ER-CFA	f1a	fine	0	30	3f	sample	.	.	.	.	.	.	13	2780	.
CAPU-99-1028	PU-10001	ER-CFA	f1a	fine	30	53	3f	sample	.	.	.	.	.	.	3.8 (U)	1620	.
CAPU-99-1029	PU-10001	ER-CFA	f1a	coarse	64	84	3c	sample	.	.	.	.	.	.	0.8	134.4	.
CAPU-99-1030	PU-10002	ER-CFA	f1 (pre-lab)	fine	25	41	4	sample	.	.	.	.	.	.	0.074 (U)	9.57	.
CAPU-99-1031	PU-10002	ER-CFA	f1 (pre-lab)	fine	41	65	4	sample	.	.	.	.	.	.	0.27 (U)	37.4	.
CAPU-99-1032	PU-10003	ER-CFA	c3	fine	0	15	3f	sample	.	.	.	.	.	.	0.51	114.5	.
CAPU-99-1033	PU-10003	ER-CFA	c3	coarse	35	56	3c	sample	.	.	.	.	.	.	0.85	267	.
CAPU-99-1034	PU-10003	ER-CFA	c3	fine	56	68	3f	sample	.	.	.	.	.	.	0.25 (U)	112.1	.
CAPU-99-1035	PU-10004	ER-CFA	f1	fine	5	35	2f	sample	.	.	.	.	.	.	0.114 (U)	23.9	.
CAPU-99-1036	PU-10004	ER-CFA	f1 (pre-lab?)	coarse	42	61	4	sample	.	.	.	.	.	.	0.009 (U)	9.51	.
CAPU-99-1037	PU-10005	ER-CFA	c2	fine	5	14	2f	sample	.	.	.	.	.	.	2.3	218	.
CAPU-99-1038	PU-10005	ER-CFA	c2	coarse	27	45	2c	sample	.	.	.	.	.	.	0.81	82.9	.
CAPU-99-1039	PU-10005	ER-CFA	c2	coarse	58	68	2c	sample	.	.	.	.	.	.	4.5	548	.
CAPU-99-1040	PU-10005	ER-CFA	c2	fine	68	77	2f	sample	.	.	.	.	.	.	1.58	277	.
CAPU-99-1041	PU-10007	ER-CFA	c1	coarse	0	26	1c	sample	.	.	.	.	.	.	-0.004 (U)	13.5	.
CAPU-99-1042	PU-10008	ER-CFA	c2	fine	0	20	2f	sample	.	.	.	.	.	.	0.124	17.4	.
CAPU-99-1043	PU-10008	ER-CFA	c2	fine	20	33	2f	sample	.	.	.	.	.	.	0.183	46.1	.
CAPU-99-1044	PU-10009	ER-CFA	c2	fine	5	23	2f	sample	.	.	.	.	.	.	0.445	129.7	.
CAPU-99-1045	PU-10009	ER-CFA	c2	coarse	40	55	2c	sample	.	.	.	.	.	.	0.098 (U)	20.6	.
CAPU-99-1046	PU-10011	ER-CFA	trail	na	0	0.5	5	sample	.	.	.	.	.	.	-0.007 (U)	0.123	.
CAPU-99-1047	PU-10012	ER-CFA	trail	na	0	0.5	5	sample	.	.	.	.	.	.	0.013 (U)	0.096	.
CAPU-99-1048	PU-10001	ER-CFA	f1a	fine	0	30	3f	dup	.	.	.	.	.	.	10	2640	.
CAPU-99-1049	PU-10001	ER-CFA	f1a	fine	30	53	3f	dup	.	.	.	.	.	.	2.1 (U)	1540	.
OB/A/0-18	.	NMED-OB	f1	fine	0	18	2f	sample	412	.	7.8	10.3	0.23 (U)	.	1.14	451	3.1
OB/A/24-53	.	NMED-OB	f1 (pre-lab?)	fine	24	53	4	sample	7	3.6	0.072	0.66 (U)	0.2 (U)	.	0.005 (U)	4.09	0.86
OB/A/59-69	.	NMED-OB	f1 (pre-lab?)	fine	59	69	4	sample	7.3	6.31	0.112	0.53 (U)	0.16 (U)	.	0.019 (U)	2.25	1.93
OB/A/74-84	.	NMED-OB	f1 (pre-lab?)	fine	74	84	4	sample	40.3	3.58	0.85	1.17 (U)	0.21 (U)	.	0.137	30.2	3.29
OB/B/0-15	.	NMED-OB	c3	fine	0	15	3f	sample	358	124	.	68	17.4	.	4.53	373	10.2
OB/B/15-36	.	NMED-OB	c3	fine	15	36	3f	sample	2040	.	278	228	15.2	.	9.6	1880	5.37
OB/C/0-12	.	NMED-OB	c2	fine	0	12	2f	sample	86.8	.	2.58	1.3 (U)	0.31 (U)	.	0.1 (U)	92	3.3
OB/C/12-24	.	NMED-OB	c2	fine	12	24	2f	sample	185	.	22.2	35.8	6.9	.	1.46	205	4.8
OB/D/0-14	.	NMED-OB	c2	fine	0	14	2f	sample	78	.	1.1	0.55 (U)	0.25 (U)	.	0.193	68.4	2.53
ACS-12-1	.	EPA	c2? (c3?)	coarse	0	30	2c	sample	.	.	.	12.8	3.19	.	-0.03635 (U)	0.1225 (U)	.
ACS-12-2	.	EPA	c2? (c3?)	fine	30	62	2f	sample	.	.	.	23.8	5.53	.	0.43	0.01797 (U)	.
ACS-18-1	.	EPA	c2	fine	0	26	2f	sample	.	.	.	4.01	0.51	.	0.27	77	.
ACS-18-2	.	EPA	c2	fine	26	46	2f	sample	.	.	.	3.35	0.65	.	0.65	112	.
ACS-18-3	.	EPA	c2	fine	0	26	2f	dup	.	.	.	3.3	0.74	.	0.21	82	.
ACS-3-1	.	EPA	f1	fine	0	28	2f	sample	.	.	.	1.71	0.25	.	0.48	137	.
ACS-3-2	.	EPA	f1	fine	37	62	2f	sample	.	.	.	0.0661 (U)	-0.0631 (U)	.	0.0621 (U)	2.73	.
ACS-3-3	.	EPA	f1	fine	62	89	2f	sample	.	.	.	29.3	2.84	.	1.06	117	.
ACS-3-4	.	EPA	f1	fine	89	104	2f	sample	.	.	.	10.6	7.1	.	0.84	140	.
ACS-35-0	.	EPA	c1	coarse	2	10	1c	sample	.	.	.	0.19	0.079 (U)	.	0.1211 (U)	27.5	.
ACS-48-0	.	EPA	f1	fine	0	12	2f	sample	.	.	.	3.7	0.93	.	1.02	184	.

Table D-2

SAMPLE_ID	LOCATION_ID	Uranium-235 (pCi/g)	Uranium-238 (pCi/g)	Strontium-90 (pCi/g)	Cesium-134 (pCi/g)	Cobalt-60 (pCi/g)	Europium-152 (pCi/g)	Ruthenium-106 (pCi/g)	Uranium-235 (by g-spec) (pCi/g)	Sodium-22 (pCi/g)
CAPU-99-1005	PU-10000	2 (U)	16.6	80	0.027 (U)	-0.021 (U)	0.04 (U)	0.13 (U)	0.99	-0.038 (U)
CAPU-99-1006	PU-10002	0.336	2.56	1.19	-0.023 (U)	-0.008 (U)	0.09 (U)	0.32 (U)	0.26 (R)	0.021 (U)
CAPU-99-1007	PU-10003	1.3 (U)	5.1 (U)	70	-0.073 (U)	0.06 (U)	-0.02 (U)	-0.31 (U)	0.273 (R)	-0.03 (U)
CAPU-99-1008	PU-10005	0.22 (U)	2.66	46.9	0.02 (U)	0.08 (U)	0.02 (U)	-0.6 (U)	0.3 (R)	-0.02 (U)
CAPU-99-1009	PU-10006	0.076 (U)	1	0.38 (U)	-0.007 (U)	0.026 (U)	0 (U)	-0.24 (U)	0.122 (R)	0.015 (U)
CAPU-99-1010	PU-10010	0.035 (U)	0.539	0.18 (U)	0.02 (U)	0.007 (U)	-0.11 (U)	-0.01 (U)	0.04 (U)	-0.05 (U)
CAPU-99-1023	PU-10000	.	.	.	.	.	.	.	.	.
CAPU-99-1024	PU-10000	.	.	.	.	.	.	.	.	.
CAPU-99-1025	PU-10000	.	.	.	.	.	.	.	.	.
CAPU-99-1026	PU-10000	.	.	.	.	.	.	.	.	.
CAPU-99-1027	PU-10001	.	.	.	.	.	.	.	.	.
CAPU-99-1028	PU-10001	.	.	.	.	.	.	.	.	.
CAPU-99-1029	PU-10001	.	.	.	.	.	.	.	.	.
CAPU-99-1030	PU-10002	.	.	.	.	.	.	.	.	.
CAPU-99-1031	PU-10002	.	.	.	.	.	.	.	.	.
CAPU-99-1032	PU-10003	.	.	.	.	.	.	.	.	.
CAPU-99-1033	PU-10003	.	.	.	.	.	.	.	.	.
CAPU-99-1034	PU-10003	.	.	.	.	.	.	.	.	.
CAPU-99-1035	PU-10004	.	.	.	.	.	.	.	.	.
CAPU-99-1036	PU-10004	.	.	.	.	.	.	.	.	.
CAPU-99-1037	PU-10005	.	.	.	.	.	.	.	.	.
CAPU-99-1038	PU-10005	.	.	.	.	.	.	.	.	.
CAPU-99-1039	PU-10005	.	.	.	.	.	.	.	.	.
CAPU-99-1040	PU-10005	.	.	.	.	.	.	.	.	.
CAPU-99-1041	PU-10007	.	.	.	.	.	.	.	.	.
CAPU-99-1042	PU-10008	.	.	.	.	.	.	.	.	.
CAPU-99-1043	PU-10008	.	.	.	.	.	.	.	.	.
CAPU-99-1044	PU-10009	.	.	.	.	.	.	.	.	.
CAPU-99-1045	PU-10009	.	.	.	.	.	.	.	.	.
CAPU-99-1046	PU-10011	.	.	.	.	.	.	.	.	.
CAPU-99-1047	PU-10012	.	.	.	.	.	.	.	.	.
CAPU-99-1048	PU-10001	.	.	.	.	.	.	.	.	.
CAPU-99-1049	PU-10001	.	.	.	.	.	.	.	.	.
OB/A/0-18	.	0.27 (U)	3.6	4.37	0.21 (U)	0.22 (U)	1.8 (U)	1.9 (U)	0.81 (U)	0.35 (U)
OB/A/24-53	.	0.082 (U)	0.76	0.53	0.2 (U)	0.3 (U)	1.3 (U)	1.8 (U)	0.59 (U)	0.3 (U)
OB/A/59-69	.	0.13	1.05	2.13	0.19 (U)	0.23 (U)	1.1 (U)	1.5 (U)	0.53 (U)	0.12 (U)
OB/A/74-84	.	0.199	1.71	2.07	0.19 (U)	0.26 (U)	1 (U)	1.8 (U)	0.63 (U)	0.2 (U)
OB/B/0-15	.	0.52	4.02	56	0.15 (U)	0.17 (U)	0.54 (U)	1.3 (U)	0.5 (U)	0.13 (U)
OB/B/15-36	.	0.285	2.53	32.7	0.24 (U)	0.33 (U)	1.7 (U)	1.8 (U)	0.68 (U)	0.29 (U)
OB/C/0-12	.	0.26 (U)	1.83	0.48	0.27 (U)	0.24 (U)	1.4 (U)	2.3 (U)	0.88 (U)	0.32 (U)
OB/C/12-24	.	0.85	2.35	1.04	0.2 (U)	0.22 (U)	1.1 (U)	1.4 (U)	0.48 (U)	0.24 (U)
OB/D/0-14	.	0.127	1.5	0.36 (U)	0.17 (U)	0.25 (U)	0.89 (U)	1.5 (U)	0.52 (U)	0.28 (U)
ACS-12-1	.	.	.	3.54	.	.	.	.	.	.
ACS-12-2	.	.	.	20.7	.	.	.	.	.	.
ACS-18-1	.	.	.	0.36 (U)	.	.	.	.	.	.
ACS-18-2	.	.	.	1.21	.	.	.	.	.	.
ACS-18-3	.	.	.	0.55 (U)	.	.	.	.	.	.
ACS-3-1	.	.	.	0.89	.	.	.	.	.	.
ACS-3-2	.	.	.	0.74 (U)	.	.	.	.	.	.
ACS-3-3	.	.	.	5.6	.	.	.	.	.	.
ACS-3-4	.	.	.	10.8	.	.	.	.	.	.
ACS-35-0	.	.	.	0.91 (U)	.	.	.	.	.	.
ACS-48-0	.	.	.	2.12	.	.	.	.	.	.

Appendix E

SAMPLE_ID	LOCATION_ID	Source	Geomorphic Unit	Sediment Facies	Start Depth (cm)	End Depth (cm)	Bin	Type	Americium-241 (a-spec) (pCi/g)	Americium-241 (g spec) (pCi/g)	Americium-241 maximum (pCi/g)	Cesium-137 (pCi/g)	Tritium (pCi/g)	Plutonium-238 (pCi/g)	Plutonium-239 (pCi/g)	Strontium-90 (pCi/g)	Uranium-234 (pCi/g)	Uranium-235 (pCi/g)	Uranium-238 (pCi/g)
ACS-12-1		EPA	c2? (c3?)	coarse	0	30	2c	sample		12.8	12.8	3.19		-0.03635	0.1225	3.54			
CAPU-99-1038	PU-10005	ER-CFA	c2	coarse	27	45	2c	sample						0.81	82.9				
CAPU-99-1039	PU-10005	ER-CFA	c2	coarse	58	68	2c	sample						4.5	548				
CAPU-99-1045	PU-10009	ER-CFA	c2	coarse	40	55	2c	sample						0.098	20.6				
								c2 coarse average	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**1.34**	**163**	**3.54**	**n/a**	**n/a**	**n/a**
CAPU-99-1025	PU-10000	ER-CFA	f1a	coarse	29	39	3c	sample						4.5	1660				
CAPU-99-1026	PU-10000	ER-CFA	f1a	coarse	58	86	3c	sample						0.91	234				
CAPU-99-1029	PU-10001	ER-CFA	f1a	coarse	64	84	3c	sample						0.8	134.4				
CAPU-99-1033	PU-10003	ER-CFA	c3	coarse	35	56	3c	sample						0.85	267				
								bin 3 coarse average (c3,f1a)	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**1.77**	**574**	**n/a**	**n/a**	**n/a**	**n/a**
CAPU-99-1036	PU-10004	ER-CFA	f1 (pre-lab?)	coarse	42	61	4	sample						0.009	9.51				
ACS-35-0		EPA	c1	coarse	2	10	1c	sample		0.19	0.19	0.079		0.1211	27.5	0.91			
CAPU-99-1010	PU-10010	ER-CFA	c1	coarse	0	20	1c	sample				0.25	0.0069	0.058	14.74	0.18	0.648	0.035	0.539
CAPU-99-1041	PU-10007	ER-CFA	c1	coarse	0	26	1c	sample						-0.004	13.5				
								bin 1 average (c1)	**n/a**	**n/a**	**0.19**	**0.16**	**0.0069**	**0.058**	**18.6**	**0.55**	**0.65**	**0.04**	**0.54**
CAPU-99-1009	PU-10006	ER-CFA	c1b	fine	0	10	1f	sample				0.12	0.0048	0.12	26	0.38	1.27	0.076	1
								bin 1b average (c1b)			**0.19**	**0.12**	**0.0048**	**0.12**	**26.0**	**0.38**	**1.27**	**0.08**	**1.00**
ACS-12-2		EPA	c2? (c3?)	fine	30	62	2f	sample		23.8	23.8	5.53		0.43	0.01797	20.7			
ACS-18-1		EPA	c2	fine	0	26	2f	sample		4.01	4.01	0.51		0.27	77	0.36			
ACS-18-2		EPA	c2	fine	26	46	2f	sample		3.35	3.35	0.65		0.65	112	1.21			
ACS-3-1		EPA	f1	fine	0	28	2f	sample		1.71	1.71	0.25		0.48	137	0.89			
ACS-3-2		EPA	f1	fine	37	62	2f	sample		0.0661	0.0661	-0.0631		0.0621	2.73	0.74			
ACS-3-3		EPA	f1	fine	62	89	2f	sample		29.3	29.3	2.84		1.06	117	5.6			
ACS-3-4		EPA	f1	fine	89	104	2f	sample		10.6	10.6	7.1		0.84	140	10.8			
ACS-48-0		EPA	f1	fine	0	12	2f	sample		3.7	3.7	0.93		1.02	184	2.12			
CAPU-99-1006	PU-10002	ER-CFA	f1	fine	0	10	2f	sample		4.4	4.4	0.57	0.0058	0.46	94.2	1.19	4.63	0.336	2.56
CAPU-99-1008	PU-10005	ER-CFA	c2	fine	45	58	2f	sample		67	67	148	1.86	3.19	393	46.9	4.64	0.22	2.66
CAPU-99-1035	PU-10004	ER-CFA	f1	fine	5	35	2f	sample						0.114	23.9				
CAPU-99-1037	PU-10005	ER-CFA	c2	fine	5	14	2f	sample						2.3	218				
CAPU-99-1040	PU-10005	ER-CFA	c2	fine	68	77	2f	sample						1.58	277				
CAPU-99-1042	PU-10008	ER-CFA	c2	fine	0	20	2f	sample						0.124	17.4				
CAPU-99-1043	PU-10008	ER-CFA	c2	fine	20	33	2f	sample						0.183	46.1				
CAPU-99-1044	PU-10009	ER-CFA	c2	fine	5	23	2f	sample						0.445	129.7				
OB/A/0-18		NMED-OB	f1	fine	0	18	2f	sample	7.8	10.3	10.3	0.23		1.14	451	4.37	3.1	0.27	3.6
OB/C/0-12		NMED-OB	c2	fine	0	12	2f	sample	2.58	1.3	2.58	0.31		0.1	92	0.48	3.3	0.26	1.83
OB/C/12-24		NMED-OB	c2	fine	12	24	2f	sample	22.2	35.8	35.8	6.9		1.46	205	1.04	4.8	0.85	2.35
OB/D/0-14		NMED-OB	c2	fine	0	14	2f	sample	1.1	0.55	1.1	0.25		0.193	68.4	0.36	2.53	0.127	1.5
								bin 2 fine average (c2,f1)	**n/a**	**n/a**	**14.1**	**12.4**	**0.93**	**0.81**	**139**	**6.91**	**3.83**	**0.34**	**2.42**
ACS-18-3		EPA	c2	fine	0	26	2f	dup		3.3	3.3	0.74		0.21	82	0.55			
CAPU-99-1005	PU-10000	ER-CFA	f1a	fine	39	49	3f	sample		64	64	-0.007	0.045	17.8	6780	80	21.5	2	16.6
CAPU-99-1007	PU-10003	ER-CFA	c3	fine	19	35	3f	sample		93	93	0.11	0.049	16.8	4990	70	5	1.3	5.1
CAPU-99-1023	PU-10000	ER-CFA	f1a	fine	0	10	3f	sample						2	1002				
CAPU-99-1024	PU-10000	ER-CFA	f1a	fine	14	29	3f	sample						37.3	7780				
CAPU-99-1027	PU-10001	ER-CFA	f1a	fine	0	30	3f	sample						13	2780				
CAPU-99-1028	PU-10001	ER-CFA	f1a	fine	30	53	3f	sample						3.8	1620				
CAPU-99-1032	PU-10003	ER-CFA	c3	fine	0	15	3f	sample						0.51	114.5				
CAPU-99-1034	PU-10003	ER-CFA	c3	fine	56	68	3f	sample						0.25	112.1				
OB/B/0-15		NMED-OB	c3	fine	0	15	3f	sample		68	68	17.4		4.53	373	56	10.2	0.52	4.02
OB/B/15-36		NMED-OB	c3	fine	15	36	3f	sample	278	228	278	15.2		9.6	1880	32.7	5.37	0.285	2.53
								bin 3 fine average (c3,f1a)	**n/a**	**n/a**	**126**	**8.18**	**0.047**	**10.6**	**2743**	**59.7**	**10.5**	**1.03**	**7.06**
CAPU-99-1048	PU-10001	ER-CFA	f1a	fine	0	30	3f	dup						10	2640				
CAPU-99-1049	PU-10001	ER-CFA	f1a	fine	30	53	3f	dup						2.1	1540				
CAPU-99-1030	PU-10002	ER-CFA	f1 (pre-lab)	fine	25	41	4	sample						0.074	9.57				
CAPU-99-1031	PU-10002	ER-CFA	f1 (pre-lab)	fine	41	65	4	sample						0.27	37.4				
OB/A/24-53		NMED-OB	f1 (pre-lab?)	fine	24	53	4	sample	0.072	0.66	0.66	0.2		0.005	4.09	0.53	0.86	0.082	0.76
OB/A/59-69		NMED-OB	f1 (pre-lab?)	fine	59	69	4	sample	0.112	0.53	0.53	0.16		0.019	2.25	2.13	1.93	0.13	1.05
OB/A/74-84		NMED-OB	f1 (pre-lab?)	fine	74	84	4	sample	0.85	1.17	1.17	0.21		0.137	30.2	2.07	3.29	0.199	1.71
								f1 (pre-lab) fine average	**n/a**	**n/a**	**0.79**	**0.19**	**n/a**	**0.10**	**16.7**	**1.58**	**2.03**	**0.14**	**1.17**
CAPU-99-1046	PU-10011	ER-CFA	trail	na	0	0.5	5	sample						-0.007	0.123				
CAPU-99-1047	PU-10012	ER-CFA	trail	na	0	0.5	5	sample						0.013	0.096				
								trail average	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**0.003**	**0.11**	**n/a**	**n/a**	**n/a**	**n/a**
								overall maximum value	**n/a**	**n/a**	**278**	**148**	**1.86**	**37.3**	**7780**	**80**	**21.5**	**2**	**16.6**

Appendix F
Summary of RESRAD Parameters for the Extended Backyard Scenario, ACS Base

Parameter	Value Selected	Notes
Dose conversion factors	Default	RESRAD contains current information on the dose conversion factors
Concentration ratios, food intake ratios, and bioconcentration factors	Not used	Food pathways were turned off
Area of contaminated zone (m**2)	1,100	Default value, maximizes exposure via soil ingestion and external gamma
Thickness of contaminated zone (m)	2	Default value, maximizes exposure via external gamma
Basic radiation dose limit (mrem/yr)	15	Based on EPA guidance
Time since placement of material (yr)	0	Default value, does not allow for any radiological decay
Initial concentrations of principal radionuclides	See Table 5 for values	Set to the weighted reach average value
Cover depth (m)	0	Default value, assumes exposure to surface geomorphic units
Density of contaminated zone (g/cm**3)	1.5	Default value, parameter is used in the tritium submodel
Physical parameters of the contaminated zone	Default	Transport is not being modeled
Evapotranspiration coefficient	0.999	Minimizes net infiltration and minimizes the tritium SRSG
Precipitation (m/yr)	0.35	Los Alamos value
Irrigation (m/yr)	0	Gardening pathway disabled
Watershed parameters	Not used	
Physical parameters of the saturated zone	Not used	Transport is not being modeled
Distribution coefficients	Not used	Transport is not being modeled
Inhalation rate (m**3/yr)	10,500	Assumes child respiration rate for moderate activity of 1.2 m**3/hr
Mass loading for inhalation (g/m**3)	0.0002	Agricultural value of 0.0002
Exposure duration (yr)	6	Assumes child 6-12 years old
Shielding factors	Not used	Parameter applies to indoor time fraction only
Fraction of time spent outdoors (on site)	0.0228	Assume 200 hours out of 8760 in a year
Shape factor flag, external gamma	Default value	For circular contaminated zone - will overestimate external dose for non-circular contaminated areas
Soil ingestion rate (g/yr)	626	After adjusting for occupancy this equals 14.3 g/yr
Depth of soil mixing layer (m)	Not used	Plant pathway is turned off
Storage times of contaminated foodstuffs (days)	Not used	Food pathways are turned off

Summary : Extended Backyard, 200 hrs/yr, 71 mg/hr soil ingestion, ACS Base
File : EB_ACS.RAD

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Dose Conversion Factor (and Related) Parameter Summary
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	H-3	6.400E-08	6.400E-08	DCF2(4)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(5)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(6)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(7)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(8)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(9)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(10)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(11)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(12)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(13)
B-1	U-233	1.350E-01	1.350E-01	DCF2(14)
B-1	U-234	1.320E-01	1.320E-01	DCF2(15)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(16)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(17)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	H-3	6.400E-08	6.400E-08	DCF3(4)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(5)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(6)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(7)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(8)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(9)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(10)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(11)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(12)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(13)
D-1	U-233	2.890E-04	2.890E-04	DCF3(14)
D-1	U-234	2.830E-04	2.830E-04	DCF3(15)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(16)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(17)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(4,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(4,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(5,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(7,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(7,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(7,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(8,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(8,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(17,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(17,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(4,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(4,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(5,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(6,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(7,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(8,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(17,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(17,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.100E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	3.000E+01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	not used	3.000E+00	---	T(3)
R011	Times for calculations (yr)	not used	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	1.900E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.600E-01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): H-3	1.000E-02	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Pu-238	6.000E-02	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.900E+01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Sr-90	5.400E-01	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): U-234	6.800E-01	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-235	4.000E-02	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): U-238	5.600E-01	0.000E+00	---	S1(17)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(17)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	5.500E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	3.500E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.332E-08	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.000E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.097E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.624E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.321E-07	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.331E-06	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R017	Inhalation rate (m**3/yr)	1.050E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	6.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.280E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	6.260E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1100.00 square meters	Am-241	1.900E-01
Thickness:	2.00 meters	Cs-137	1.600E-01
Cover Depth:	0.00 meters	H-3	1.000E-02
		Pu-238	6.000E-02
		Pu-239	1.900E+01
		Sr-90	5.400E-01
		U-234	6.800E-01
		U-235	4.000E-02
		U-238	5.600E-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	3.000E+01
TDOSE(t):	1.040E+00	1.032E+00
M(t):	6.932E-02	6.877E-02

Maximum TDOSE(t): 1.040E+00 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.743E-04	0.0002	4.724E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.863E-03	0.0095
Cs-137	1.092E-02	0.0105	2.828E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.129E-04	0.0001
H-3	0.000E+00	0.0000	1.299E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.405E-09	0.0000
Pu-238	2.002E-07	0.0000	1.313E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.730E-03	0.0026
Pu-239	1.186E-04	0.0001	4.568E-02	0.0439	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.600E-01	0.9232
Sr-90	2.987E-04	0.0003	3.918E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.165E-03	0.0011
U-234	5.795E-06	0.0000	5.030E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.747E-03	0.0026
U-235	6.324E-04	0.0006	2.758E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.525E-04	0.0001
U-238	1.573E-03	0.0015	3.703E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.150E-03	0.0021
Total	1.373E-02	0.0132	4.719E-02	0.0454	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.789E-01	0.9414

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-02	0.0101
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-02	0.0106
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.306E-06	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-03	0.0028
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.006E+00	0.9673
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.468E-03	0.0014
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.256E-03	0.0031
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.125E-04	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.094E-03	0.0039
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.040E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.661E-04	0.0002	4.501E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.399E-03	0.0091
Cs-137	5.462E-03	0.0053	1.414E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.644E-05	0.0001
H-3	0.000E+00	0.0000	1.269E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.257E-19	0.0000
Pu-238	1.580E-07	0.0000	1.036E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.154E-03	0.0021
Pu-239	1.186E-04	0.0001	4.564E-02	0.0442	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.591E-01	0.9298
Sr-90	1.463E-04	0.0001	1.918E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.705E-04	0.0006
U-234	6.081E-06	0.0000	5.033E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.748E-03	0.0027
U-235	6.329E-04	0.0006	2.811E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.583E-04	0.0002
U-238	1.573E-03	0.0015	3.703E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.150E-03	0.0021
Total	8.105E-03	0.0079	4.710E-02	0.0457	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.764E-01	0.9465

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.001E-02	0.0097
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.519E-03	0.0053
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.275E-16	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.257E-03	0.0022
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.005E+00	0.9741
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.187E-04	0.0007
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.257E-03	0.0032
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.193E-04	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.094E-03	0.0040
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.032E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) t= 0.000E+00	(mrem/yr)/(pCi/g) 3.000E+01
Am-241	Am-241	1.000E+00	5.531E-02	5.271E-02
Am-241	Np-237	1.000E+00	0.000E+00	8.590E-07
Am-241	U-233	1.000E+00	0.000E+00	3.183E-12
Am-241	Th-229	1.000E+00	0.000E+00	6.407E-14
Am-241	äDSR(j)		5.531E-02	5.271E-02
Cs-137	Cs-137	1.000E+00	6.898E-02	3.449E-02
H-3	H-3	1.000E+00	1.306E-04	1.275E-14
Pu-238	Pu-238	1.000E+00	4.768E-02	3.762E-02
Pu-238	U-234	1.000E+00	0.000E+00	3.678E-07
Pu-238	Th-230	1.000E+00	0.000E+00	1.061E-10
Pu-238	Ra-226	1.000E+00	0.000E+00	1.220E-11
Pu-238	Pb-210	1.000E+00	0.000E+00	1.025E-12
Pu-238	äDSR(j)		4.768E-02	3.762E-02
Pu-239	Pu-239	1.000E+00	5.294E-02	5.289E-02
Pu-239	U-235	1.000E+00	0.000E+00	6.098E-10
Pu-239	Pa-231	1.000E+00	0.000E+00	1.574E-12
Pu-239	Ac-227	1.000E+00	0.000E+00	7.264E-13
Pu-239	äDSR(j)		5.294E-02	5.289E-02
Sr-90	Sr-90	1.000E+00	2.718E-03	1.331E-03
U-234	U-234	1.000E+00	4.787E-03	4.787E-03
U-234	Th-230	1.000E+00	0.000E+00	2.656E-06
U-234	Ra-226	1.000E+00	0.000E+00	4.487E-07
U-234	Pb-210	1.000E+00	0.000E+00	4.764E-08
U-234	äDSR(j)		4.787E-03	4.790E-03
U-235	U-235	1.000E+00	2.031E-02	2.031E-02
U-235	Pa-231	1.000E+00	0.000E+00	1.048E-04
U-235	Ac-227	1.000E+00	0.000E+00	6.746E-05
U-235	äDSR(j)		2.031E-02	2.048E-02
U-238	U-238	1.000E+00	7.310E-03	7.310E-03
U-238	U-234	1.000E+00	0.000E+00	4.139E-07
U-238	Th-230	1.000E+00	0.000E+00	1.148E-10
U-238	Ra-226	1.000E+00	0.000E+00	1.295E-11
U-238	Pb-210	1.000E+00	0.000E+00	1.076E-12
U-238	äDSR(j)		7,310E-03	7.310E-03

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter:
CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 15 mrem/yr

Nuclide (i)	t= 0.000E+00	3.000E+01
Am-241	2.712E+02	2.846E+02
Cs-137	2.174E+02	4.349E+02
H-3	1.149E+05	1.176E+15
Pu-238	3.146E+02	3.987E+02
Pu-239	2.834E+02	2.836E+02
Sr-90	5.518E+03	1.127E+04
U-234	3.133E+03	3.132E+03
U-235	7.385E+02	7.323E+02
U-238	2.052E+03	2.052E+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 = 0.000E+00 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	1.900E-01	0.000E+00	5.531E-02	2.712E+02	5.531E-02	2.712E+02
Cs-137	1.600E-01	0.000E+00	6.898E-02	2.174E+02	6.898E-02	2.174E+02
H-3	1.000E-02	0.000E+00	1.306E-04	1.149E+05	1.306E-04	1.149E+05
Pu-238	6.000E-02	0.000E+00	4.768E-02	3.146E+02	4.768E-02	3.146E+02
Pu-239	1.900E+01	0.000E+00	5.294E-02	2.834E+02	5.294E-02	2.834E+02
Sr-90	5.400E-01	0.000E+00	2.718E-03	5.518E+03	2.718E-03	5.518E+03
U-234	6.800E-01	3.000E+01	4.790E-03	3.132E+03	4.788E-03	3.133E+03
U-235	4.000E-02	3.000E+01	2.048E-02	7.323E+02	2.031E-02	7.385E+02
U-238	5.600E-01	0.000E+00	7.310E-03	2.052E+03	7.310E-03	2.052E+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	3.000E+01
Am-241	Am-241	1.000E+00	1.051E-02	1.001E-02
Np-237	Am-241	1.000E+00	2.740E-09	1.632E-07
U-233	Am-241	1.000E+00	2.202E-16	6.048E-13
Th-229	Am-241	1.000E+00	1.088E-19	1.217E-14
Cs-137	Cs-137	1.000E+00	1.104E-02	5.519E-03
H-3	H-3	1.000E+00	1.306E-06	1.275E-16
Pu-238	Pu-238	1.000E+00	2.861E-03	2.257E-03
U-234	Pu-238	1.000E+00	4.061E-10	2.207E-08
U-234	U-234	1.000E+00	3.255E-03	3.255E-03
U-234	U-238	1.000E+00	3.800E-09	2.318E-07
U-234	äDOSE(j):		3.255E-03	3.255E-03
Th-230	Pu-238	1.000E+00	2.464E-15	6.368E-12
Th-230	U-234	1.000E+00	2.961E-08	1.806E-06
Th-230	U-238	1.000E+00	2.304E-14	6.430E-11
Th-230	äDOSE(j):		2.961E-08	1.806E-06
Ra-226	Pu-238	1.000E+00	6.855E-18	7.322E-13
Ra-226	U-234	1.000E+00	1.098E-10	3.051E-07
Ra-226	U-238	1.000E+00	7.271E-17	7.251E-12
Ra-226	äDOSE(j):		1.098E-10	3.051E-07
Pb-210	Pu-238	1.000E+00	1.765E-20	6.148E-14
Pb-210	U-234	1.000E+00	3.550E-13	3.240E-08
Pb-210	U-238	1.000E+00	0.000E+00	6.025E-13
Pb-210	äDOSE(j):		3.550E-13	3.240E-08
Pu-239	Pu-239	1.000E+00	1.006E+00	1.005E+00
U-235	Pu-239	1.000E+00	1.900E-10	1.159E-08
U-235	U-235	1.000E+00	8.124E-04	8.124E-04
U-235	äDOSE(j):		8.124E-04	8.124E-04
Pa-231	Pu-239	1.000E+00	1.072E-14	2.990E-11
Pa-231	U-235	1.000E+00	6.874E-08	4.191E-06
Pa-231	äDOSE(j):		6.874E-08	4.191E-06
Ac-227	Pu-239	1.000E+00	1.514E-16	1.380E-11
Ac-227	U-235	1.000E+00	1.294E-09	2.699E-06
Ac-227	äDOSE(j):		1.294E-09	2.699E-06
Sr-90	Sr-90	1.000E+00	1.468E-03	7.187E-04

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	3.000E+01
U-238	U-238	1.000E+00	4.094E-03	4.094E-03

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	3.000E+01
Am-241	Am-241	1.000E+00	1.900E-01	1.810E-01
Np-237	Am-241	1.000E+00	0.000E+00	1.802E-06
U-233	Am-241	1.000E+00	0.000E+00	1.192E-10
Th-229	Am-241	1.000E+00	0.000E+00	1.129E-13
Cs-137	Cs-137	1.000E+00	1.600E-01	8.000E-02
H-3	H-3	1.000E+00	1.000E-02	9.861E-13
Pu-238	Pu-238	1.000E+00	6.000E-02	4.734E-02
U-234	Pu-238	1.000E+00	0.000E+00	4.543E-06
U-234	U-234	1.000E+00	6.800E-01	6.799E-01
U-234	U-238	1.000E+00	0.000E+00	4.762E-05
U-234	äS(j):		6.800E-01	6.800E-01
Th-230	Pu-238	1.000E+00	0.000E+00	6.376E-10
Th-230	U-234	1.000E+00	0.000E+00	1.836E-04
Th-230	U-238	1.000E+00	0.000E+00	6.430E-09
Th-230	äS(j):		0.000E+00	1.836E-04
Ra-226	Pu-238	1.000E+00	0.000E+00	2.807E-12
Ra-226	U-234	1.000E+00	0.000E+00	1.188E-06
Ra-226	U-238	1.000E+00	0.000E+00	2.777E-11
Ra-226	äS(j):		0.000E+00	1.188E-06
Pb-210	Pu-238	1.000E+00	0.000E+00	5.550E-13
Pb-210	U-234	1.000E+00	0.000E+00	2.973E-07
Pb-210	U-238	1.000E+00	0.000E+00	5.434E-12
Pb-210	äS(j):		0.000E+00	2.973E-07
Pu-239	Pu-239	1.000E+00	1.900E+01	1.898E+01
U-235	Pu-239	1.000E+00	0.000E+00	5.611E-07
U-235	U-235	1.000E+00	4.000E-02	4.000E-02
U-235	äS(j):		4.000E-02	4.000E-02
Pa-231	Pu-239	1.000E+00	0.000E+00	1.781E-10
Pa-231	U-235	1.000E+00	0.000E+00	2.538E-05
Pa-231	äS(j):		0.000E+00	2.538E-05
Ac-227	Pu-239	1.000E+00	0.000E+00	4.538E-11
Ac-227	U-235	1.000E+00	0.000E+00	9.032E-06
Ac-227	äS(j):		0.000E+00	9.032E-06
Sr-90	Sr-90	1.000E+00	5.400E-01	2.644E-01

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	3.000E+01
U-238	U-238	1.000E+00	5.600E-01	5.600E-01

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

RESMAIN5.EXE execution time = 80.08 seconds

Appendix G
Summary of RESRAD Parameters for the Extended Backyard Scenario, ACS Bin 2

Parameter	Value Selected	Notes
Dose conversion factors	Default	RESRAD contains current information on the dose conversion factors
Concentration ratios, food intake ratios, and bioconcentration factors	Not used	Food pathways were turned off
Area of contaminated zone (m**2)	1,100	Default value, maximizes exposure via soil ingestion and external gamma
Thickness of contaminated zone (m)	2	Default value, maximizes exposure via external gamma
Basic radiation dose limit (mrem/yr)	15	Based on EPA guidance
Time since placement of material (yr)	0	Default value, does not allow for any radiological decay
Initial concentrations of principal radionuclides	See Table 5 for values	Set to the weighted reach average value
Cover depth (m)	0	Default value, assumes exposure to surface geomorphic units
Density of contaminated zone (g/cm**3)	1.5	Default value, parameter is used in the tritium submodel
Physical parameters of the contaminated zone	Default	Transport is not being modeled
Evapotranspiration coefficient	0.999	Minimizes net infiltration and minimizes the tritium SRSG
Precipitation (m/yr)	0.35	Los Alamos value
Irrigation (m/yr)	0	Gardening pathway disabled
Watershed parameters	Not used	
Physical parameters of the saturated zone	Not used	Transport is not being modeled
Distribution coefficients	Not used	Transport is not being modeled
Inhalation rate (m**3/yr)	10,500	Assumes child respiration rate for moderate activity of 1.2 m**3/hr
Mass loading for inhalation (g/m**3)	0.0002	Agricultural value of 0.0002
Exposure duration (yr)	6	Assumes child 6-12 years old
Shielding factors	Not used	Parameter applies to indoor time fraction only
Fraction of time spent outdoors (on site)	0.0130	Assume 114 hours out of 8760 in a year, based on assuming use is proportional to relative area of this bin (673/1100)
Shape factor flag, external gamma	Default value	For circular contaminated zone - will overestimate external dose for non-circular contaminated areas
Soil ingestion rate (g/yr)	626	After adjusting for occupancy this equals 14.3 g/yr
Depth of soil mixing layer (m)	Not used	Plant pathway is turned off
Storage times of contaminated foodstuffs (days)	Not used	Food pathways are turned off

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Dose Conversion Factor (and Related) Parameter Summary
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	H-3	6.400E-08	6.400E-08	DCF2(4)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(5)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(6)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(7)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(8)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(9)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(10)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(11)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(12)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(13)
B-1	U-233	1.350E-01	1.350E-01	DCF2(14)
B-1	U-234	1.320E-01	1.320E-01	DCF2(15)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(16)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(17)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	H-3	6.400E-08	6.400E-08	DCF3(4)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(5)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(6)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(7)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(8)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(9)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(10)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(11)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(12)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(13)
D-1	U-233	2.890E-04	2.890E-04	DCF3(14)
D-1	U-234	2.830E-04	2.830E-04	DCF3(15)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(16)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(17)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(4,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(4,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(5,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(7,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(7,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(7,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(8,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(8,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(17,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(17,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(4,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(4,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(5,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(6,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(7,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(8,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(17,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(17,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.100E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	3.000E+01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	not used	3.000E+00	---	T(3)
R011	Times for calculations (yr)	not used	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	1.390E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.220E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): H-3	9.000E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Pu-238	7.000E-01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.200E+02	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Sr-90	6.400E+00	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): U-234	3.100E+00	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-235	3.000E-01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): U-238	1.900E+00	0.000E+00	---	S1(17)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(17)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	5.500E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	3.500E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.332E-08	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.000E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.097E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.624E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.321E-07	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.331E-06	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R017	Inhalation rate (m**3/yr)	1.050E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	6.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.300E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	6.260E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1100.00 square meters	Am-241	1.390E+01
Thickness:	2.00 meters	Cs-137	1.220E+01
Cover Depth:	0.00 meters	H-3	9.000E-01
		Pu-238	7.000E-01
		Pu-239	1.200E+02
		Sr-90	6.400E+00
		U-234	3.100E+00
		U-235	3.000E-01
		U-238	1.900E+00

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	3.000E+01
TDOSE(t):	4.589E+00	4.316E+00
M(t):	3.059E-01	2.877E-01

Maximum TDOSE(t): 4.589E+00 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	7.271E-03	0.0016	1.971E-02	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.114E-01	0.0897
Cs-137	4.749E-01	0.1035	1.229E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.907E-03	0.0011
H-3	0.000E+00	0.0000	1.169E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.287E-07	0.0000
Pu-238	1.332E-06	0.0000	8.734E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.816E-02	0.0040
Pu-239	4.273E-04	0.0001	1.645E-01	0.0358	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.457E+00	0.7533
Sr-90	2.019E-03	0.0004	2.647E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.875E-03	0.0017
U-234	1.506E-05	0.0000	1.308E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.140E-03	0.0016
U-235	2.705E-03	0.0006	1.179E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.521E-04	0.0001
U-238	3.044E-03	0.0007	7.164E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.159E-03	0.0009
Total	4.904E-01	0.1069	1.874E-01	0.0408	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.911E+00	0.8523

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.384E-01	0.0955
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.798E-01	0.1046
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.173E-04	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-02	0.0041
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.622E+00	0.7892
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.920E-03	0.0022
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.462E-03	0.0018
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.475E-03	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.920E-03	0.0017
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.589E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	6.930E-03	0.0016	1.878E-02	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.920E-01	0.0908
Cs-137	2.375E-01	0.0550	6.147E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.454E-03	0.0006
H-3	0.000E+00	0.0000	1.142E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.211E-17	0.0000
Pu-238	1.051E-06	0.0000	6.891E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.433E-02	0.0033
Pu-239	4.269E-04	0.0001	1.644E-01	0.0381	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.454E+00	0.8002
Sr-90	9.883E-04	0.0002	1.296E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.855E-03	0.0009
U-234	1.581E-05	0.0000	1.308E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.142E-03	0.0017
U-235	2.706E-03	0.0006	1.202E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.769E-04	0.0002
U-238	3.044E-03	0.0007	7.164E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.159E-03	0.0010
Total	2.516E-01	0.0583	1.860E-01	0.0431	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.879E+00	0.8986

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.178E-01	0.0968
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.399E-01	0.0556
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-02	0.0035
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.619E+00	0.8384
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.857E-03	0.0011
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.466E-03	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.504E-03	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.920E-03	0.0018
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.316E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) t= 0.000E+00	(mrem/yr)/(pCi/g) 3.000E+01
Am-241	Am-241	1.000E+00	3.154E-02	3.005E-02
Am-241	Np-237	1.000E+00	0.000E+00	4.898E-07
Am-241	U-233	1.000E+00	0.000E+00	1.815E-12
Am-241	Th-229	1.000E+00	0.000E+00	3.653E-14
Am-241	äDSR(j)		3.154E-02	3.005E-02
Cs-137	Cs-137	1.000E+00	3.933E-02	1.967E-02
H-3	H-3	1.000E+00	1.303E-04	1.273E-14
Pu-238	Pu-238	1.000E+00	2.719E-02	2.145E-02
Pu-238	U-234	1.000E+00	0.000E+00	2.097E-07
Pu-238	Th-230	1.000E+00	0.000E+00	6.051E-11
Pu-238	Ra-226	1.000E+00	0.000E+00	6.958E-12
Pu-238	Pb-210	1.000E+00	0.000E+00	5.842E-13
Pu-238	äDSR(j)		2.719E-02	2.145E-02
Pu-239	Pu-239	1.000E+00	3.018E-02	3.016E-02
Pu-239	U-235	1.000E+00	0.000E+00	3.477E-10
Pu-239	Pa-231	1.000E+00	0.000E+00	8.973E-13
Pu-239	Ac-227	1.000E+00	0.000E+00	4.142E-13
Pu-239	äDSR(j)		3.018E-02	3.016E-02
Sr-90	Sr-90	1.000E+00	1.550E-03	7.588E-04
U-234	U-234	1.000E+00	2.730E-03	2.729E-03
U-234	Th-230	1.000E+00	0.000E+00	1.514E-06
U-234	Ra-226	1.000E+00	0.000E+00	2.558E-07
U-234	Pb-210	1.000E+00	0.000E+00	2.716E-08
U-234	äDSR(j)		2.730E-03	2.731E-03
U-235	U-235	1.000E+00	1.158E-02	1.158E-02
U-235	Pa-231	1.000E+00	0.000E+00	5.975E-05
U-235	Ac-227	1.000E+00	0.000E+00	3.847E-05
U-235	äDSR(j)		1.158E-02	1.168E-02
U-238	U-238	1.000E+00	4.168E-03	4.168E-03
U-238	U-234	1.000E+00	0.000E+00	2.360E-07
U-238	Th-230	1.000E+00	0.000E+00	6.547E-11
U-238	Ra-226	1.000E+00	0.000E+00	7.383E-12
U-238	Pb-210	1.000E+00	0.000E+00	6.135E-13
U-238	äDSR(j)		4.168E-03	4.168E-03

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter:
CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 15 mrem/yr

Nuclide (i)	t= 0.000E+00	3.000E+01
Am-241	4.756E+02	4.991E+02
Cs-137	3.814E+02	7.627E+02
H-3	1.151E+05	1.179E+15
Pu-238	5.517E+02	6.992E+02
Pu-239	4.970E+02	4.974E+02
Sr-90	9.678E+03	1.977E+04
U-234	5.495E+03	5.492E+03
U-235	1.295E+03	1.284E+03
U-238	3.599E+03	3.599E+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 = 0.000E+00 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	1.390E+01	0.000E+00	3.154E-02	4.756E+02	3.154E-02	4.756E+02
Cs-137	1.220E+01	0.000E+00	3.933E-02	3.814E+02	3.933E-02	3.814E+02
H-3	9.000E-01	0.000E+00	1.303E-04	1.151E+05	1.303E-04	1.151E+05
Pu-238	7.000E-01	0.000E+00	2.719E-02	5.517E+02	2.719E-02	5.517E+02
Pu-239	1.200E+02	0.000E+00	3.018E-02	4.970E+02	3.018E-02	4.970E+02
Sr-90	6.400E+00	0.000E+00	1.550E-03	9.678E+03	1.550E-03	9.678E+03
U-234	3.100E+00	3.000E+01	2.731E-03	5.492E+03	2.730E-03	5.495E+03
U-235	3.000E-01	3.000E+01	1.168E-02	1.284E+03	1.158E-02	1.295E+03
U-238	1.900E+00	0.000E+00	4.168E-03	3.599E+03	4.168E-03	3.599E+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	3.000E+01
Am-241	Am-241	1.000E+00	4.384E-01	4.177E-01
Np-237	Am-241	1.000E+00	1.143E-07	6.808E-06
U-233	Am-241	1.000E+00	9.184E-15	2.523E-11
Th-229	Am-241	1.000E+00	4.538E-18	5.078E-13
Cs-137	Cs-137	1.000E+00	4.798E-01	2.399E-01
H-3	H-3	1.000E+00	1.173E-04	1.145E-14
Pu-238	Pu-238	1.000E+00	1.903E-02	1.502E-02
U-234	Pu-238	1.000E+00	2.701E-09	1.468E-07
U-234	U-234	1.000E+00	8.462E-03	8.461E-03
U-234	U-238	1.000E+00	7.352E-09	4.484E-07
U-234	äDOSE(j):		8.462E-03	8.461E-03
Th-230	Pu-238	1.000E+00	1.639E-14	4.236E-11
Th-230	U-234	1.000E+00	7.696E-08	4.694E-06
Th-230	U-238	1.000E+00	4.458E-14	1.244E-10
Th-230	äDOSE(j):		7.696E-08	4.694E-06
Ra-226	Pu-238	1.000E+00	4.560E-17	4.871E-12
Ra-226	U-234	1.000E+00	2.854E-10	7.930E-07
Ra-226	U-238	1.000E+00	1.407E-16	1.403E-11
Ra-226	äDOSE(j):		2.854E-10	7.930E-07
Pb-210	Pu-238	1.000E+00	1.174E-19	4.090E-13
Pb-210	U-234	1.000E+00	9.228E-13	8.421E-08
Pb-210	U-238	1.000E+00	0.000E+00	1.166E-12
Pb-210	äDOSE(j):		9.228E-13	8.421E-08
Pu-239	Pu-239	1.000E+00	3.622E+00	3.619E+00
U-235	Pu-239	1.000E+00	6.843E-10	4.172E-08
U-235	U-235	1.000E+00	3.474E-03	3.474E-03
U-235	äDOSE(j):		3.474E-03	3.474E-03
Pa-231	Pu-239	1.000E+00	3.860E-14	1.077E-10
Pa-231	U-235	1.000E+00	2.939E-07	1.792E-05
Pa-231	äDOSE(j):		2.939E-07	1.792E-05
Ac-227	Pu-239	1.000E+00	5.453E-16	4.970E-11
Ac-227	U-235	1.000E+00	5.532E-09	1.154E-05
Ac-227	äDOSE(j):		5.532E-09	1.154E-05
Sr-90	Sr-90	1.000E+00	9.920E-03	4.857E-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	3.000E+01
U-238	U-238	1.000E+00	7.920E-03	7.919E-03

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	3.000E+01
Am-241	Am-241	1.000E+00	1.390E+01	1.325E+01
Np-237	Am-241	1.000E+00	0.000E+00	1.319E-04
U-233	Am-241	1.000E+00	0.000E+00	8.719E-09
Th-229	Am-241	1.000E+00	0.000E+00	8.261E-12
Cs-137	Cs-137	1.000E+00	1.220E+01	6.100E+00
H-3	H-3	1.000E+00	9.000E-01	8.875E-11
Pu-238	Pu-238	1.000E+00	7.000E-01	5.523E-01
U-234	Pu-238	1.000E+00	0.000E+00	5.300E-05
U-234	U-234	1.000E+00	3.100E+00	3.100E+00
U-234	U-238	1.000E+00	0.000E+00	1.616E-04
U-234	äS(j):		3.100E+00	3.100E+00
Th-230	Pu-238	1.000E+00	0.000E+00	7.439E-09
Th-230	U-234	1.000E+00	0.000E+00	8.370E-04
Th-230	U-238	1.000E+00	0.000E+00	2.182E-08
Th-230	äS(j):		0.000E+00	8.370E-04
Ra-226	Pu-238	1.000E+00	0.000E+00	3.274E-11
Ra-226	U-234	1.000E+00	0.000E+00	5.416E-06
Ra-226	U-238	1.000E+00	0.000E+00	9.421E-11
Ra-226	äS(j):		0.000E+00	5.416E-06
Pb-210	Pu-238	1.000E+00	0.000E+00	6.474E-12
Pb-210	U-234	1.000E+00	0.000E+00	1.355E-06
Pb-210	U-238	1.000E+00	0.000E+00	1.844E-11
Pb-210	äS(j):		0.000E+00	1.355E-06
Pu-239	Pu-239	1.000E+00	1.200E+02	1.199E+02
U-235	Pu-239	1.000E+00	0.000E+00	3.544E-06
U-235	U-235	1.000E+00	3.000E-01	3.000E-01
U-235	äS(j):		3.000E-01	3.000E-01
Pa-231	Pu-239	1.000E+00	0.000E+00	1.125E-09
Pa-231	U-235	1.000E+00	0.000E+00	1.904E-04
Pa-231	äS(j):		0.000E+00	1.904E-04
Ac-227	Pu-239	1.000E+00	0.000E+00	2.866E-10
Ac-227	U-235	1.000E+00	0.000E+00	6.774E-05
Ac-227	äS(j):		0.000E+00	6.774E-05
Sr-90	Sr-90	1.000E+00	6.400E+00	3.133E+00

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	3.000E+01
U-238	U-238	1.000E+00	1.900E+00	1.900E+00

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

RESMAIN5.EXE execution time = 81.46 seconds

Appendix H
Summary of RESRAD Parameters for the Extended Backyard Scenario, ACS Bin 3

Parameter	Value Selected	Notes
Dose conversion factors	Default	RESRAD contains current information on the dose conversion factors
Concentration ratios, food intake ratios, and bioconcentration factors	Not used	Food pathways were turned off
Area of contaminated zone (m**2)	1,100	Default value, maximizes exposure via soil ingestion and external gamma
Thickness of contaminated zone (m)	2	Default value, maximizes exposure via external gamma
Basic radiation dose limit (mrem/yr)	15	Based on EPA guidance
Time since placement of material (yr)	0	Default value, does not allow for any radiological decay
Initial concentrations of principal radionuclides	See Table 5 for values	Set to the weighted reach average value
Cover depth (m)	0	Default value, assumes exposure to surface geomorphic units
Density of contaminated zone (g/cm**3)	1.5	Default value, parameter is used in the tritium submodel
Physical parameters of the contaminated zone	Default	Transport is not being modeled
Evapotranspiration coefficient	0.999	Minimizes net infiltration and minimizes the tritium SRSG
Precipitation (m/yr)	0.35	Los Alamos value
Irrigation (m/yr)	0	Gardening pathway disabled
Watershed parameters	Not used	
Physical parameters of the saturated zone	Not used	Transport is not being modeled
Distribution coefficients	Not used	Transport is not being modeled
Inhalation rate (m**3/yr)	10,500	Assumes child respiration rate for moderate activity of 1.2 m**3/hr
Mass loading for inhalation (g/m**3)	0.0002	Agricultural value of 0.0002
Exposure duration (yr)	6	Assumes child 6-12 years old
Shielding factors	Not used	Parameter applies to indoor time fraction only
Fraction of time spent outdoors (on site)	0.00104	Assume 9.1 hours out of 8760 in a year, based on assuming use is proportional to relative area of this bin (50/1100)
Shape factor flag, external gamma	Default value	For circular contaminated zone - will overestimate external dose for non-circular contaminated areas
Soil ingestion rate (g/yr)	626	After adjusting for occupancy this equals 14.3 g/yr
Depth of soil mixing layer (m)	Not used	Plant pathway is turned off
Storage times of contaminated foodstuffs (days)	Not used	Food pathways are turned off

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Dose Conversion Factor (and Related) Parameter Summary
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	H-3	6.400E-08	6.400E-08	DCF2(4)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(5)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(6)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(7)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(8)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(9)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(10)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(11)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(12)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(13)
B-1	U-233	1.350E-01	1.350E-01	DCF2(14)
B-1	U-234	1.320E-01	1.320E-01	DCF2(15)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(16)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(17)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	H-3	6.400E-08	6.400E-08	DCF3(4)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(5)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(6)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(7)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(8)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(9)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(10)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(11)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(12)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(13)
D-1	U-233	2.890E-04	2.890E-04	DCF3(14)
D-1	U-234	2.830E-04	2.830E-04	DCF3(15)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(16)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(17)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(4,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(4,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(4,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(5,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(6,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(7,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(7,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(7,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(8,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(8,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(8,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(9,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(10,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(11,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(11,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(11,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(17,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(17,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(4,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(4,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(5,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(6,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(7,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(8,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(9,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(10,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(10,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(11,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(13,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(13,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: Default.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(17,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(17,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.100E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	2.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	3.000E+01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	not used	3.000E+00	---	T(3)
R011	Times for calculations (yr)	not used	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	1.260E+02	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	8.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): H-3	5.000E-02	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Pu-238	1.050E+01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Pu-239	2.720E+03	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Sr-90	5.920E+01	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): U-234	9.800E+00	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-235	1.000E+00	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): U-238	6.500E+00	0.000E+00	---	S1(17)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(17)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	5.500E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.990E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	3.500E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.332E-08	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	0.000E+00	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	0.000E+00	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.000E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	2.000E+03	2.000E+03	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+03	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+03	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.666E-08	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	3.000E+01	3.000E+01	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	not used	3.000E+01	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	not used	3.000E+01	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.097E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.636E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.624E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.321E-07	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.331E-06	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.556E-09	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.862E-06	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)
R017	Inhalation rate (m**3/yr)	1.050E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	6.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.040E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	6.260E+02	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1100.00 square meters	Am-241	1.260E+02
Thickness:	2.00 meters	Cs-137	8.000E+00
Cover Depth:	0.00 meters	H-3	5.000E-02
		Pu-238	1.050E+01
		Pu-239	2.720E+03
		Sr-90	5.920E+01
		U-234	9.800E+00
		U-235	1.000E+00
		U-238	6.500E+00

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	3.000E+01
TDOSE(t):	6.946E+00	6.904E+00
M(t):	4.631E-01	4.603E-01

Maximum TDOSE(t): 6.946E+00 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	5.273E-03	0.0008	1.429E-02	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.984E-01	0.0430
Cs-137	2.491E-02	0.0036	6.449E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.574E-04	0.0000
H-3	0.000E+00	0.0000	6.496E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.461E-09	0.0000
Pu-238	1.598E-06	0.0000	1.048E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.179E-02	0.0031
Pu-239	7.748E-04	0.0001	2.983E-01	0.0429	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.269E+00	0.9025
Sr-90	1.494E-03	0.0002	1.959E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.827E-03	0.0008
U-234	3.810E-06	0.0000	3.307E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.806E-03	0.0003
U-235	7.212E-04	0.0001	3.145E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.739E-04	0.0000
U-238	8.331E-04	0.0001	1.961E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.138E-03	0.0002
Total	3.402E-02	0.0049	3.142E-01	0.0452	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.598E+00	0.9499

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.179E-01	0.0458
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.517E-02	0.0036
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.497E-06	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-02	0.0033
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.568E+00	0.9455
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.341E-03	0.0011
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.140E-03	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.265E-04	0.0001
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.167E-03	0.0003
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.946E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	5.026E-03	0.0007	1.362E-02	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.843E-01	0.0412
Cs-137	1.246E-02	0.0018	3.224E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.287E-04	0.0000
H-3	0.000E+00	0.0000	6.345E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.427E-19	0.0000
Pu-238	1.261E-06	0.0000	8.269E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.719E-02	0.0025
Pu-239	7.741E-04	0.0001	2.980E-01	0.0432	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.263E+00	0.9071
Sr-90	7.314E-04	0.0001	9.591E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.853E-03	0.0004
U-234	3.997E-06	0.0000	3.309E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.806E-03	0.0003
U-235	7.217E-04	0.0001	3.205E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.805E-04	0.0000
U-238	8.330E-04	0.0001	1.961E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.138E-03	0.0002
Total	2.055E-02	0.0030	3.130E-01	0.0453	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.571E+00	0.9517

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.029E-01	0.0439
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-02	0.0018
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.347E-16	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-02	0.0026
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.562E+00	0.9504
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.594E-03	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.141E-03	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.343E-04	0.0001
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.167E-03	0.0003
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.904E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	3.000E+01
Am-241	Am-241	1.000E+00	2.523E-03	2.404E-03
Am-241	Np-237	1.000E+00	0.000E+00	3.918E-08
Am-241	U-233	1.000E+00	0.000E+00	1.452E-13
Am-241	Th-229	1.000E+00	0.000E+00	2.923E-15
Am-241	äDSR(j)		2.523E-03	2.404E-03
Cs-137	Cs-137	1.000E+00	3.147E-03	1.573E-03
H-3	H-3	1.000E+00	1.299E-04	1.269E-14
Pu-238	Pu-238	1.000E+00	2.175E-03	1.716E-03
Pu-238	U-234	1.000E+00	0.000E+00	1.678E-08
Pu-238	Th-230	1.000E+00	0.000E+00	4.841E-12
Pu-238	Ra-226	1.000E+00	0.000E+00	5.567E-13
Pu-238	Pb-210	1.000E+00	0.000E+00	4.674E-14
Pu-238	äDSR(j)		2.175E-03	1.716E-03
Pu-239	Pu-239	1.000E+00	2.415E-03	2.413E-03
Pu-239	U-235	1.000E+00	0.000E+00	2.782E-11
Pu-239	Pa-231	1.000E+00	0.000E+00	7.178E-14
Pu-239	Ac-227	1.000E+00	0.000E+00	3.313E-14
Pu-239	äDSR(j)		2.415E-03	2.413E-03
Sr-90	Sr-90	1.000E+00	1.240E-04	6.071E-05
U-234	U-234	1.000E+00	2.184E-04	2.183E-04
U-234	Th-230	1.000E+00	0.000E+00	1.211E-07
U-234	Ra-226	1.000E+00	0.000E+00	2.046E-08
U-234	Pb-210	1.000E+00	0.000E+00	2.173E-09
U-234	äDSR(j)		2.184E-04	2.185E-04
U-235	U-235	1.000E+00	9.265E-04	9.264E-04
U-235	Pa-231	1.000E+00	0.000E+00	4.780E-06
U-235	Ac-227	1.000E+00	0.000E+00	3.077E-06
U-235	äDSR(j)		9.265E-04	9.343E-04
U-238	U-238	1.000E+00	3.335E-04	3.334E-04
U-238	U-234	1.000E+00	0.000E+00	1.888E-08
U-238	Th-230	1.000E+00	0.000E+00	5.237E-12
U-238	Ra-226	1.000E+00	0.000E+00	5.906E-13
U-238	Pb-210	1.000E+00	0.000E+00	4.908E-14
U-238	äDSR(j)		3.335E-04	3.335E-04

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter:
CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 15 mrem/yr

Nuclide (i)	t= 0.000E+00	3.000E+01
Am-241	5.945E+03	6.239E+03
Cs-137	4.767E+03	9.534E+03
H-3	1.154E+05	1.182E+15
Pu-238	6.896E+03	8.741E+03
Pu-239	6.212E+03	6.218E+03
Sr-90	1.210E+05	2.471E+05
U-234	6.869E+04	6.865E+04
U-235	1.619E+04	1.606E+04
U-238	4.498E+04	4.498E+04

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

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	1.260E+02	0.000E+00	2.523E-03	5.945E+03	2.523E-03	5.945E+03
Cs-137	8.000E+00	0.000E+00	3.147E-03	4.767E+03	3.147E-03	4.767E+03
H-3	5.000E-02	0.000E+00	1.299E-04	1.154E+05	1.299E-04	1.154E+05
Pu-238	1.050E+01	0.000E+00	2.175E-03	6.896E+03	2.175E-03	6.896E+03
Pu-239	2.720E+03	0.000E+00	2.415E-03	6.212E+03	2.415E-03	6.212E+03
Sr-90	5.920E+01	0.000E+00	1.240E-04	1.210E+05	1.240E-04	1.210E+05
U-234	9.800E+00	3.000E+01	2.185E-04	6.865E+04	2.184E-04	6.869E+04
U-235	1.000E+00	3.000E+01	9.343E-04	1.606E+04	9.265E-04	1.619E+04
U-238	6.500E+00	0.000E+00	3.335E-04	4.498E+04	3.335E-04	4.498E+04

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	3.000E+01
Am-241	Am-241	1.000E+00	3.179E-01	3.029E-01
Np-237	Am-241	1.000E+00	8.289E-08	4.937E-06
U-233	Am-241	1.000E+00	6.660E-15	1.829E-11
Th-229	Am-241	1.000E+00	3.291E-18	3.683E-13
Cs-137	Cs-137	1.000E+00	2.517E-02	1.259E-02
H-3	H-3	1.000E+00	6.497E-06	6.347E-16
Pu-238	Pu-238	1.000E+00	2.284E-02	1.802E-02
U-234	Pu-238	1.000E+00	3.242E-09	1.762E-07
U-234	U-234	1.000E+00	2.140E-03	2.140E-03
U-234	U-238	1.000E+00	2.012E-09	1.227E-07
U-234	äDOSE(j):		2.140E-03	2.140E-03
Th-230	Pu-238	1.000E+00	1.967E-14	5.083E-11
Th-230	U-234	1.000E+00	1.946E-08	1.187E-06
Th-230	U-238	1.000E+00	1.220E-14	3.404E-11
Th-230	äDOSE(j):		1.946E-08	1.187E-06
Ra-226	Pu-238	1.000E+00	5.472E-17	5.845E-12
Ra-226	U-234	1.000E+00	7.218E-11	2.006E-07
Ra-226	U-238	1.000E+00	3.849E-17	3.839E-12
Ra-226	äDOSE(j):		7.218E-11	2.006E-07
Pb-210	Pu-238	1.000E+00	1.409E-19	4.908E-13
Pb-210	U-234	1.000E+00	2.334E-13	2.130E-08
Pb-210	U-238	1.000E+00	0.000E+00	3.190E-13
Pb-210	äDOSE(j):		2.334E-13	2.130E-08
Pu-239	Pu-239	1.000E+00	6.568E+00	6.562E+00
U-235	Pu-239	1.000E+00	1.241E-09	7.566E-08
U-235	U-235	1.000E+00	9.265E-04	9.264E-04
U-235	äDOSE(j):		9.265E-04	9.265E-04
Pa-231	Pu-239	1.000E+00	6.999E-14	1.952E-10
Pa-231	U-235	1.000E+00	7.839E-08	4.780E-06
Pa-231	äDOSE(j):		7.839E-08	4.780E-06
Ac-227	Pu-239	1.000E+00	9.889E-16	9.013E-11
Ac-227	U-235	1.000E+00	1.475E-09	3.077E-06
Ac-227	äDOSE(j):		1.475E-09	3.077E-06
Sr-90	Sr-90	1.000E+00	7.341E-03	3.594E-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	3.000E+01
U-238	U-238	1.000E+00	2.167E-03	2.167E-03

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	3.000E+01
Am-241	Am-241	1.000E+00	1.260E+02	1.201E+02
Np-237	Am-241	1.000E+00	0.000E+00	1.195E-03
U-233	Am-241	1.000E+00	0.000E+00	7.903E-08
Th-229	Am-241	1.000E+00	0.000E+00	7.488E-11
Cs-137	Cs-137	1.000E+00	8.000E+00	4.000E+00
H-3	H-3	1.000E+00	5.000E-02	4.930E-12
Pu-238	Pu-238	1.000E+00	1.050E+01	8.284E+00
U-234	Pu-238	1.000E+00	0.000E+00	7.950E-04
U-234	U-234	1.000E+00	9.800E+00	9.799E+00
U-234	U-238	1.000E+00	0.000E+00	5.528E-04
U-234	äS(j):		9.800E+00	9.800E+00
Th-230	Pu-238	1.000E+00	0.000E+00	1.116E-07
Th-230	U-234	1.000E+00	0.000E+00	2.646E-03
Th-230	U-238	1.000E+00	0.000E+00	7.463E-08
Th-230	äS(j):		0.000E+00	2.646E-03
Ra-226	Pu-238	1.000E+00	0.000E+00	4.912E-10
Ra-226	U-234	1.000E+00	0.000E+00	1.712E-05
Ra-226	U-238	1.000E+00	0.000E+00	3.223E-10
Ra-226	äS(j):		0.000E+00	1.712E-05
Pb-210	Pu-238	1.000E+00	0.000E+00	9.712E-11
Pb-210	U-234	1.000E+00	0.000E+00	4.285E-06
Pb-210	U-238	1.000E+00	0.000E+00	6.307E-11
Pb-210	äS(j):		0.000E+00	4.285E-06
Pu-239	Pu-239	1.000E+00	2.720E+03	2.718E+03
U-235	Pu-239	1.000E+00	0.000E+00	8.033E-05
U-235	U-235	1.000E+00	1.000E+00	9.999E-01
U-235	äS(j):		1.000E+00	1.000E+00
Pa-231	Pu-239	1.000E+00	0.000E+00	2.549E-08
Pa-231	U-235	1.000E+00	0.000E+00	6.345E-04
Pa-231	äS(j):		0.000E+00	6.345E-04
Ac-227	Pu-239	1.000E+00	0.000E+00	6.497E-09
Ac-227	U-235	1.000E+00	0.000E+00	2.258E-04
Ac-227	äS(j):		0.000E+00	2.258E-04
Sr-90	Sr-90	1.000E+00	5.920E+01	2.898E+01

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	3.000E+01
U-238	U-238	1.000E+00	6.500E+00	6.500E+00

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

RESMAIN5.EXE execution time = 90.26 seconds