RADIOLOGICAL ASSESSMENT

FOR

READING, PENNSYLVANIA SLAG PILE SITE

Prepared for:

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1.0 INTRODUCTION

The purpose of this Radiological Assessment is to calculate radiological doses (TEDE - total effective dose equivalent) for a group of potential future scenarios at the Reading, Pennsylvania Slag Pile Site. The new NRC rule specifying radiological criteria for decommissioning, 10 CFR Part 20, Subpart E, became effective on August 20, 1997 (FR, 1997). This Radiological Assessment is a complement to a Decommissioning Plan (STEP, 2000) being submitted to meet the requirements of the new rule. This report demonstrates that concentrations of radionuclides in materials on the Site are sufficiently low that the Site qualifies for release without restriction on use and are also as low as reasonably achievable (ALARA) without any additional decommissioning activities.

Cabot Corporation (Cabot) holds US Nuclear Regulatory Commission (NRC) License SMC-1562 for source materials at two locations, one at Reading, Pennsylvania and one at Revere, Pennsylvania. A separate Decommissioning Plan for the Revere site was submitted to the NRC in November 1997 (Cabot, 1997, STEP, 1997a). All portions of the Reading Site except for a slag pile on a steep embankment, described below, have been decommissioned (NES, 1995, USNRC, 1995a) and released for unrestricted use. This Radiological Assessment applies only to the slag pile remaining at the Reading Site and a relatively small quantity of slag in the River Road right-of-way (ROW) at the base of the slag pile.

Cabot has performed a comprehensive Site characterization and analysis including: surface gamma measurements, radiological analysis of surface and subsurface soil samples, radiological analysis of groundwater samples, characterization of the Site topography, climate, physiography, geology, hydrogeology and surface water hydrology, measurement of the leach rate of uranium from the slag, determination of the leach rates of thorium and radium, evaluation of the weathering rate of the slag, and analysis of the slag pile stability. The results of this work were reported to the NRC in several submittals (Cabot, 1996a, 1996b, 1996c, and 1996d, and NES, 1996a and 1996b). The NRC reviewed this information and approved the characterization work (USNRC, 1996). Supplemental decommissioning work has included the preparation of a Hydrologic and Geologic Assessment (STEP, 1997b) for the Reading Site, a Report on the Topographic and Radiological Surveys (STEP, 1999), this Radiological Assessment, and a Decommissioning Plan (STEP, 2000).

The Site characterization information was used as recommended in current NRC guidance documents to develop exposure scenarios and assumptions for the assessment of theoretical maximum radiation doses that might result from unrestricted use of the Site. The NRC guidance documents provide a framework for dose assessment that consists of using conservative assumptions modified as appropriate by Site-specific conditions (USNRC, 1999a, USNRC, 1999b, Beyeler, 1998a, and Beyeler, 1999b).

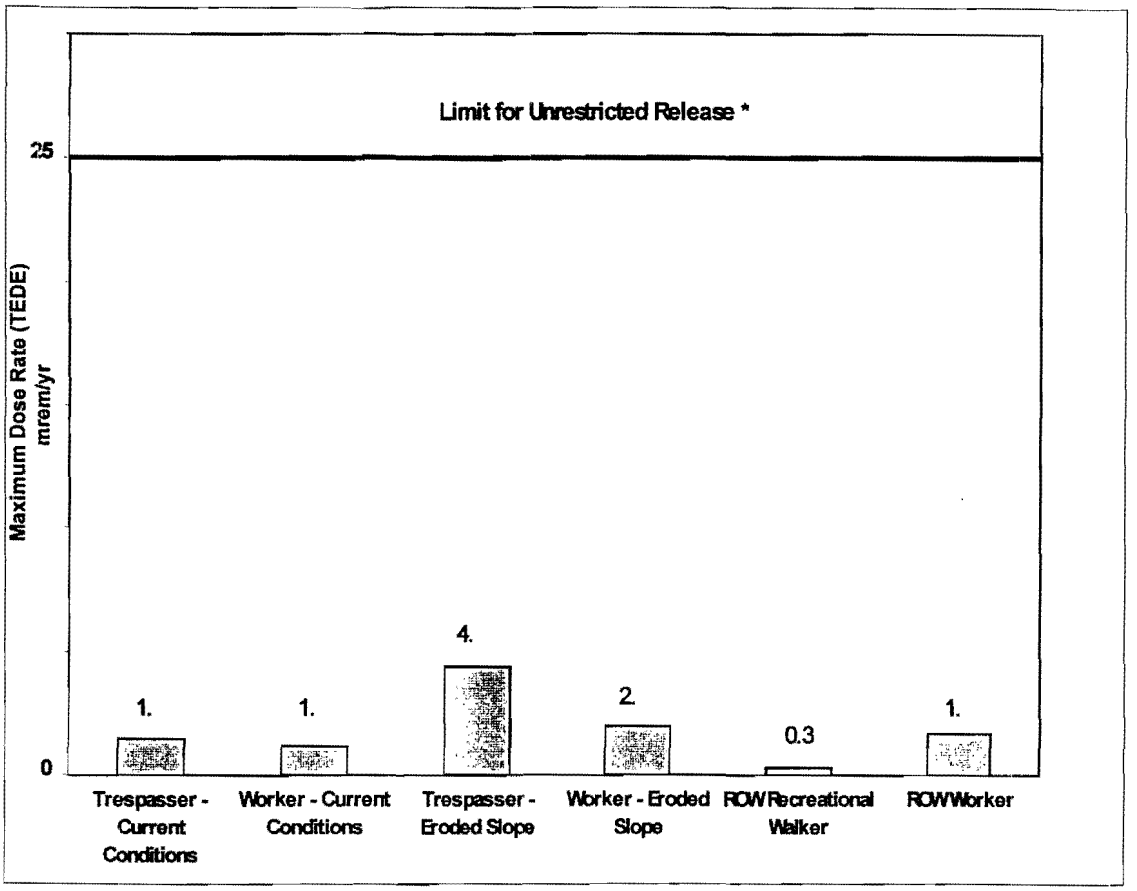
Two basic exposure scenarios were developed and evaluated as a base or primary analysis for the slag pile. The first of these was a trespasser who walks on the Site and the second a worker on the Site. Radionuclide concentrations in surface soils on the slope of the pile are likely to be significantly lower than concentrations in deeper soils on the slope because of the soil cover. The radiation dose that might be received by a person using the Site depends strongly on the radionuclide concentrations in soils near the surface. For this reason, two variations of each of the two basic scenarios were analyzed. In the first, the trespasser or worker was assumed to be exposed to concentrations representative of current conditions. In the second, the trespasser or worker was assumed to be exposed to soils bearing radionuclides expected to be more typical of deeper soils on the slope. This variant can be considered to be conservatively representative of possible future conditions at the Site, after some erosion has occurred. As presented in the Decommissioning Plan, (DP) the slope is stable and the eroded scenario is not likely to occur. Detailed descriptions of the modeling input parameters and results are contained in this Radiological Assessment.

At the request of the NRC, a separate analysis was performed for the River Road ROW Area. Development of scenarios for analysis recognizes the limited potential uses of the ROW segment. The most severe exposure scenarios would likely involve some kind of occasional recreational or some occupational use involving excavation. Even in those scenarios, exposure time would be small. Two basic exposure scenario types were developed for purposes of analysis. The first of these was a recreational walker who routinely walks on the ROW segment for exercise or pleasure. The second is a worker who participates in excavation in the ROW segment. For purposes of easy identification, they are named recreational walker and worker.

The maximum calculated dose for each scenario is presented below in both tabular and graphic form and is compared to the 25 mrem/y limit (10 CFR 20 Subpart E) for unrestricted release. As shown, the maximum calculated doses are all substantially less than the limit for unrestricted release.

CASE	MAXIMUM ANNUAL TOTAL DOSE (mrem/y TEDE)
Slag Pile; Trespasser—current conditions	1.5
Slag Pile; Trespasser—eroded slope	4.4
Slag Pile; Worker—current conditions	1.2
Slag Pile; Worker—eroded slope	2.0
ROW; Recreational Walker	0.32
ROW; Worker	1.7
The 10 CFR Part 20 dose criterion for license termination with no restrictions on use is 25 mrem/y.	

MAXIMUM ANNUAL RADIATION DOSE (TEDE) RESULTS - SUMMARY



* Unrestricted Release = Less Than 25 mrem/year (10 CFR 20 Subpart E)

The doses calculated above represent the maximum likely doses that might result from unrestricted use of the Site. Sensitivity analyses were also conducted to test the robustness of conclusions based on the primary analysis. Two approaches are useful in sensitivity analysis. In one approach, the exposure scenarios developed for the primary analysis are reevaluated using unrealistically conservative values for important input parameters—e.g., unreasonably long exposure durations. In the second approach, exposure scenarios that may be entirely implausible for site conditions, but which otherwise could result in greater potential for exposure than more plausible scenarios, are evaluated on a hypothetical basis. If the results of the sensitivity analyses also support the conclusions drawn from the primary analysis, assurance of the soundness of those conclusions is increased.

Both types of sensitivity analysis were included in this assessment. The first type, Variations on Expected Use scenarios, examines the effect of parameter value variation on the results obtained in the primary analysis described in the main report by using extremely conservative values for key parameters. The second type, is a single

scenario—the resident gardener scenario. This scenario is considered too unlikely for evaluation in the primary analysis, but evaluation as a sensitivity case permits examination of the scenario on a hypothetical basis. The resident gardener sensitivity analysis was included in the assessment at the request of NRC (USNRC, 1999c). The results for these sensitivity analyses were lower than the 10 CFR 20 Subpart E criteria for unrestricted release. A maximum dose of 13 millirem per year was calculated for the Variation on Expected Uses scenarios. A maximum dose of 15.4 millirem per year was calculated for the resident gardener scenario. These results provide additional assurance that the Site, including materials in the River Road ROW, qualifies for unrestricted release.

An analysis to demonstrate that maximum doses from unrestricted release of the Site would be as low as reasonably achievable (ALARA), is also included in this radiological assessment. The conclusion from this analysis is that release without restrictions meets ALARA criteria.

In summary, the potential exposure levels for the current conditions and any reasonable future conditions involving unrestricted use are all well below the 25 mrem/y criteria for unrestricted release and unrestricted release is ALARA. As a result no decommissioning activities are required.

Summary Site Description

Comprehensive information on the Site, operations at the Site, and the license termination in general is provided in the Decommissioning Plan. For that reason, only a summary description is provided here.

The Reading Slag Pile is located in Reading, Berks County, Pennsylvania. Figure 1-1 shows the location of the Reading Site. Slag materials from metal processing activities performed in the late 1960's were deposited on a preexisting slag pile. Kawecki Chemical (Kawecki), a predecessor to Cabot, leased a portion of the facility when the operations which lead to placement of the slag were conducted. Cabot has never owned or operated the Site.

The Kawecki process was designed to increase the percentage of tantalum in low grade ores by heating a mixture of iron ore, tantalum ore (tin slags), and coke in an electric arc furnace. The ores used by Kawecki contained naturally occurring uranium and thorium in concentrations defined as "source material" by the Atomic Energy Commission (AEC). The AEC is now the NRC. The possession and handling of these materials was performed under AEC/NRC license. The tantalum alloyed with the iron leaving a glass-like silica gangue in which the naturally occurring thorium and uranium remained. This operation was conducted during 1967 and 1968.

The glass-like slag residues from Kawecki's processing operations were placed on a pre-existing slag disposal area on an embankment at the southwest end of the property. This

same area had been used before 1967 for slag disposal from manufacturing operations conducted by one or more companies unaffiliated with Kawecki Chemical. Additional material was placed there in 1977 and 1978 as a result of building decontamination activities including sand mixed with tin slag from a location in Baltimore. The slag pile is located southwest of the former gas house shown as the 1-story block building on the Site Map (Figure 1-2). The slag extends approximately 160 feet along the length of the embankment.

As shown on Figure 1-1 and Figure 1-2, the slag pile is located east of the Schuylkill River. The area is urban with land use being primarily industrial or related to the transportation corridor along the river. Between the Slag Pile Area and the Schuylkill River are a currently undeveloped extension of the River Road right-of-way (ROW), a Norfolk Southern (Norfolk) railroad ROW and remnants of the former Schuylkill Canal. Another Norfolk ROW is located approximately 150 feet northwest of the slag pile. Buttonwood Street is located approximately 600 feet to the southeast of the pile. The larger industrial property which contains the small slag area extents northeast to Tulpehocken Street.

Topographic survey information and results of the Site-characterization efforts were used to refine the estimates of the dimensions of the radiological slag at the Site. The maximum cross sectional area of the slag pile was estimated to be approximately 1,000 ft^2. The approximate length of the slag pile, as reported in the NES Characterization Report (NES, 1996a), is 160 ft. The estimated volume of the slag pile and slag in the River Road ROW is approximately 180,000 ft^3. The top of the slag pile is a level area that is approximately 160 feet long and extends back a maximum of 15 feet from the top edge of the slag pile. Its elevation is approximately that of the much larger contiguous level area upon which industrial facilities are located.

Because the property is not owned by the licensee, the area encompassing the slag pile and associated materials has been defined as the "Site" for purposes of discussion in this Radiological Assessment. The Site consists of the area containing radiological slag and slag mixed with soil and debris. The areal extent of the Site is shown on the Site Map (Figure 1-2). Currently there are no buildings, structures or apparent use within the Site area. The Site is heavily vegetated with mature trees and brush.

Although the original Site characterization indicated the presence of some slag beyond the toe of the slag pile, the extent of those depositions appeared to be limited and the concentrations of radionuclides within the depositions were in the range of the concentrations of naturally occurring radionuclides. Consequently, at that time, explicit radiological assessment for these materials was considered unnecessary.

Supplementary characterization work was performed after submittal of the original Radiological Assessment and Decommissioning Plan (Revision 0, August 1998). This work included a topographic survey of the slag pile and additional radiological characterization of materials beyond the base of the slag pile (STEP, 1999 and STEP,

2000). This work indicates that the extent of the depositions and the concentrations of radionuclides, though quite limited, are somewhat greater than originally thought. The maximum volume of slag/soil mix in the River Road ROW area is estimated to be approximately 10,000 to 20,000 ft^3. In particular, the greater extent of slag depositions in the River Road ROW would seem to permit exposure scenarios that differ from those developed for evaluation of the slag pile. Although it is possible to infer from the slag pile analysis results that doses for exposure scenarios appropriate for evaluation of the River Road ROW materials are below NRC criteria for release for use without restrictions, the reasoning supporting that inference is not straightforward. Consequently, an explicit radiological assessment for materials in the River Road ROW to determine and document whether concentrations of radionuclides in materials in the ROW are sufficiently low that the ROW qualifies for unrestricted use is included in this assessment.

The Site topography, climate, physiography and geology, soils, surface water hydrology, and groundwater hydrology are described in detail in the Decommissioning Plan (STEP, 2000), the Hydrologic and Geologic Assessment Report (STEP, 1997b), and the Report on Topographic and Radiological Surveys (STEP, 1999).

Radiological Assessment

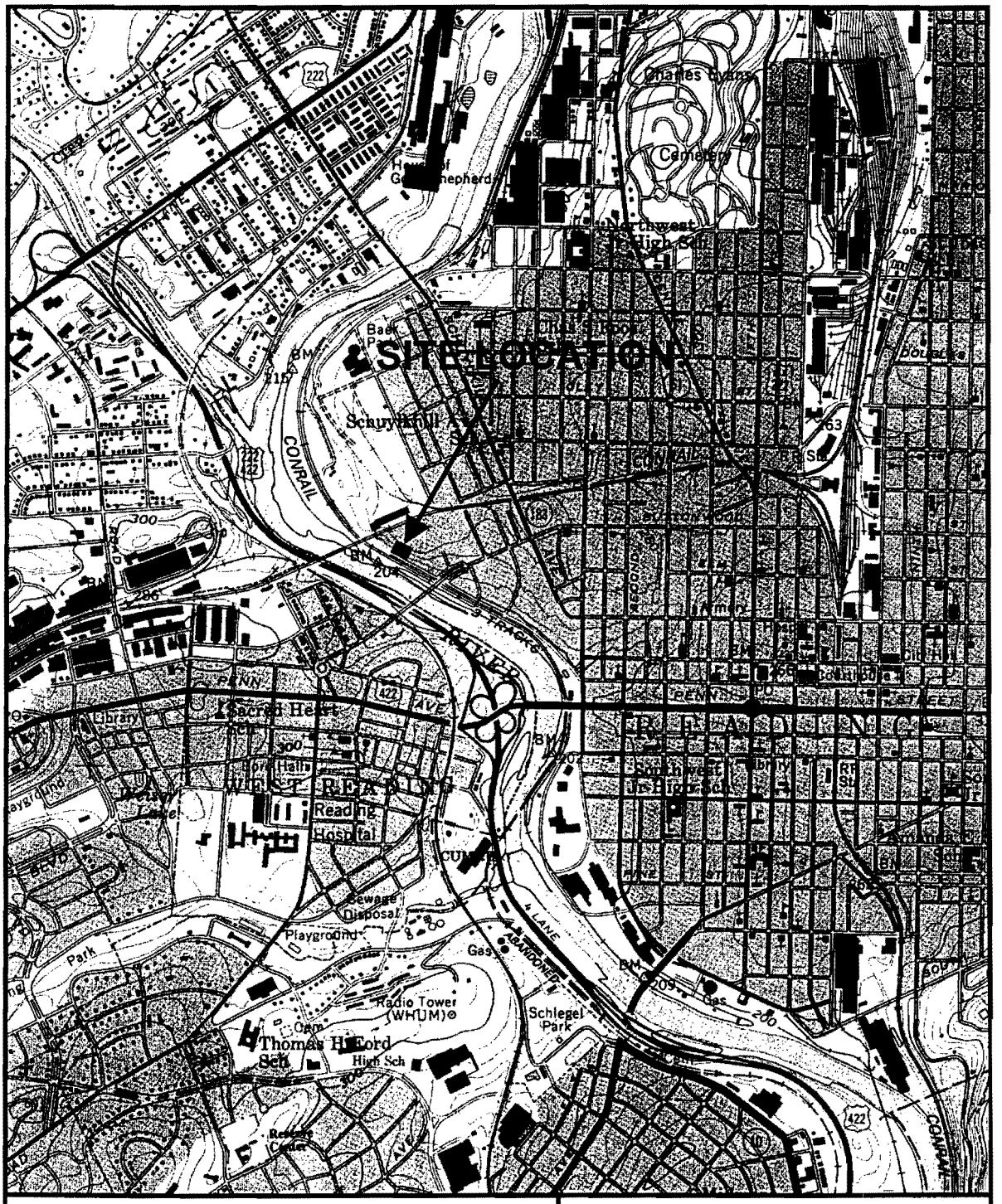
The NRC radiological criteria for license termination are expressed in terms of radiation dose that might reasonably be expected from residual radioactive material after decommissioning. As used in this report, the term "dose" means total effective dose equivalent (TEDE), which is the quantity expressed in the NRC regulation. At the Reading Site this dose would depend upon concentrations of residual radioactive materials in soils and other remaining materials. The dose would also depend on Site-specific factors that might control potential resource use, potential migration of radioactive materials, and potential access to radioactive materials. Finally, this dose would also depend on potential activities of future users of the Site.

The radiation dose assessment process, as applied herein, includes the estimation of the maximum radiation dose (TEDE) that might be received by a typical member of a small group of people that could be expected to receive the highest doses from use of the Site as far as 1,000 years into the future, as required in the radiological criteria for license termination. Thus, the assessment considers not only the expected conditions at the Site, soon after remediation, but potential (albeit unlikely) conditions projected for the distant future, as well. The assessment evaluates potential uses of the Site and potential migration of radioactive materials through the environment over time, taking account of both natural processes and human activities that could be expected to alter the patterns or rates of constituent movement.

In general, the dose assessment process consists of two steps: 1) development of representations of Site physical conditions and potentially exposed populations, and expression of these representations in mathematical terms; and 2) use of a mathematical

model with input from the representations and/or technical literature to estimate future exposures and radiation doses (TEDE) as a function of time. The dual objective in the development of simplified representations is that the representations be realistic and not result in underestimation of exposures and doses. The following sections describe the representations of the radioactive material source, the Site environs, and potential exposure scenarios (step 1), and the dose assessment methodology and results (step 2).

Remaining sections of this report describe the radioactive material source (Section 2.0), potential radiation exposure scenarios (Section 3.0), the dose assessment methodology (Section 4.0), results (Section 5.0), ALARA analysis, (Section 6.0), and conclusions (Section 7.0).


SITE LOCATION
CONRAIL
Charles Evans
Cemetery
Northwest
High Sch
Schuylkill
Sacred Heart
Sch
Library
Hall
Reading
Hospital
Sewage
Disposal
Playground
Radio Tower
(WHUM)
Thomas Heford
Sch
High Sch
Schlegel
Park
Gas
Park
Recreat
Center
Bae
Ball
Park
Ave
Pennsylvania
Ave
Lane
Abandoned
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Jr High Sch
Reading
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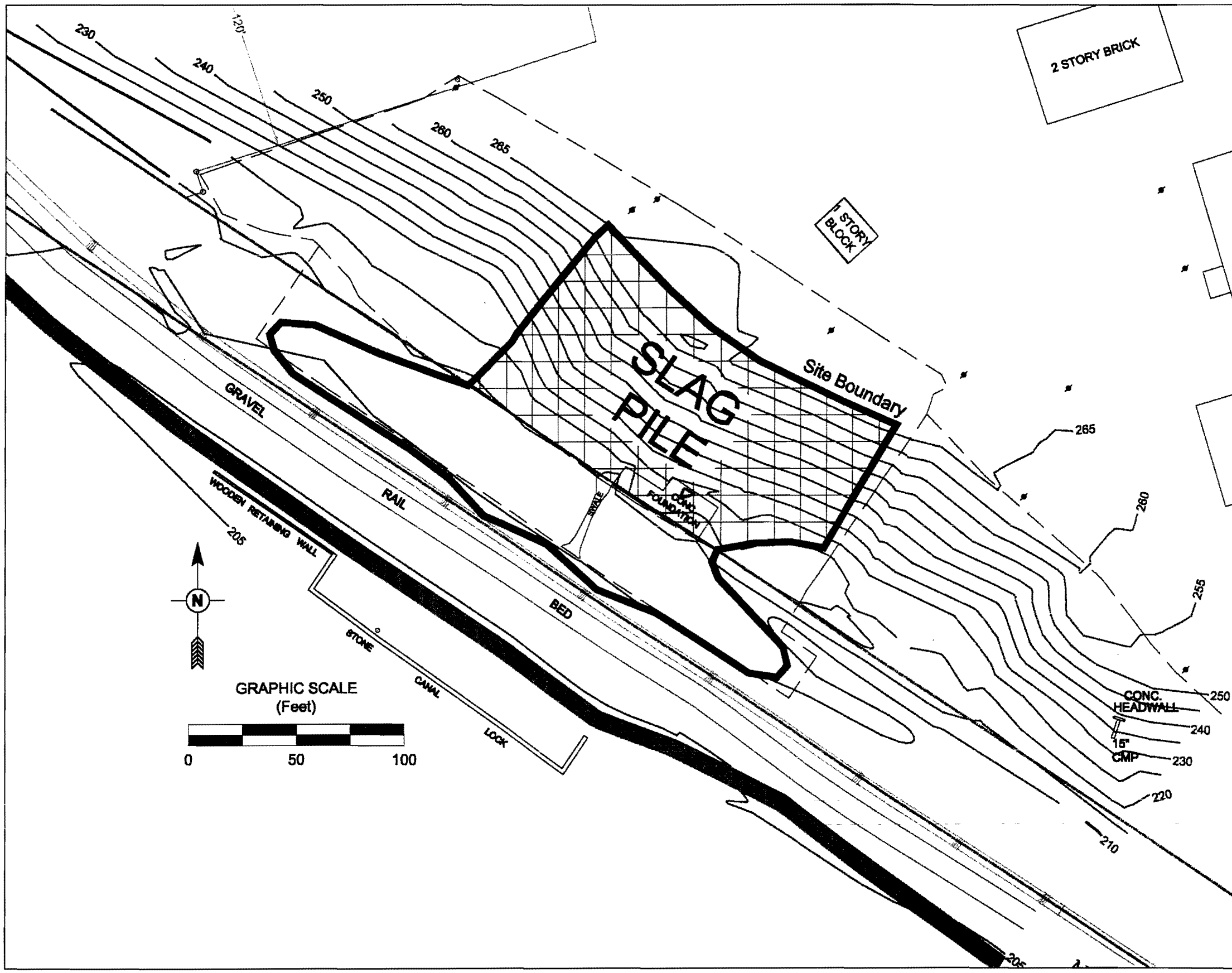


LEGEND

- SITE BOUNDARY
- PROPERTY BOUNDARIES
- ELEVATION CONTOUR LINE AND VALUE (Feet Above MSL)
- FENCE

NOTE: The base map (including property boundaries, buildings, rights of way, elevation contours, electric lines and utility poles) is to scale. It was prepared in accordance with the minimum standards for Boundary Surveys section of the Manual of Practice for Professional Land Surveyors in the Commonwealth of Pennsylvania. The boring, gamma survey, soil sample, seep sample, sediment sample, Schuylkill River, and USGS benchmark locations are approximate. They are based on descriptions, maps, and references to landmarks contained in the Site Characterization Report for the Reading Slag Pile and The USGS Reading, Pennsylvania 71/2 minute Quadrangle.

FIGURE 1-2
SITE MAP

Reading Slag Pile Site

ST Environmental Professionals, Inc.
March 2000, Project No. 97C057

2.0 RADIOACTIVE MATERIAL SOURCE

Potential radiation doses from residual radionuclides remaining on the Site after decommissioning will depend upon the types and inventories of radionuclides present, the concentrations of nuclides in materials, and the physical distribution of the materials on the Site. This section describes the development of the Site source representation for dose assessment purposes. This development consists of the definition, in spatial terms, of source units within which nuclide distributions and/or physical characteristics can be considered reasonably uniform and at the same time reasonably representative of Site conditions. Such a representation of the Site is necessary to permit description of the Site conditions in a mathematical form.

The radionuclides of interest for evaluation are known from the history of operations of the Site and from Site characterization measurements. They are naturally occurring uranium (U-238, U-234, and U-235), naturally occurring thorium (Th-232 and Th-228) and their radioactive progeny.

Radioactive materials at concentrations distinguishable above background concentrations in soils are primarily confined to slag from processing of ores that contained small concentrations of naturally occurring uranium, thorium, and progeny nuclides in addition to the non-radioactive mineral values for which the ore was processed. The slag, which retained the radioactive constituents, was deposited on the slag pile at Reading, a pre-existing disposal area on an embankment at the southwestern end of the property.

At most sites bearing residual radioactive materials, the radioactive materials are present in the form of soils bearing the radionuclides in low concentrations. In contrast, licensed radioactive materials at Reading are contained in slag particles of varying sizes, some substantial in size relative to particles of importance for the inhalation pathway. For example, As indicated in Section 1.5.1 of the Decommissioning Plan, the physical and chemical stability of these slag pieces tend to render the contained radioactive materials substantially less mobile in the environment than they might be in more commonly encountered soil forms. The slag containing licensed material is diluted by other materials that contain no licensed radioactive material—slag from other processes, demolition rubble, soils, etc.

Almost all of the slag of interest is contained on the described embankment. However, a small amount of slag has been identified in the River Road Right-of-Way (ROW) adjacent to the base of the embankment. Separate source term descriptions have been prepared for these two slag deposits.

Slag Pile

Average radionuclide concentrations in the material can be calculated from average nuclide concentrations measured in slag and soil material bearing licensed radionuclides.

Direct radiation measurements of radiation exposure rate at 1-m above the surface can also be used to estimate nuclide concentrations in soils near the surface. Results of direct radiation measurements and measurements of nuclide concentrations in surface and subsurface soil samples from the slag pile are provided in the characterization report for the Reading slag pile (Cabot, 1996a and NES, 1996a and 1996b).

Average net activity concentrations may be calculated from data in the Characterization Report (NES, 1996a). The average net (background subtracted) activity concentration in the slag/soil/debris mix is approximately 75 pCi/g of combined thorium (Th-232 and Th-228) and uranium (U-238 and U-234). (This net activity concentration is the result of subtraction of 2.6 pCi/g total uranium and 2.5 pCi/g total thorium from gross measurements, as explained in the Characterization Report.) Of the 75 pCi/g total uranium and thorium, about 22.5 pCi/g is thorium-232 and 15 pCi/g is uranium-238. Progeny from these two nuclides can be assumed to be present at equilibrium concentrations. This estimate is based on the average measured concentrations from the surface to a depth of 16 feet in Boreholes 1, 3, 4, 5, 15, and 16 at the top of the pile.

Average net uranium and thorium concentrations in soils near the surface (to a depth of 2 feet or less) are somewhat lower. For example, the average net activity concentration in surface soil samples from the slope face is approximately 25 pCi/g total combined thorium and uranium, of which approximately 5 pCi/g is U-238 and 7.5 pCi/g is Th-232. These estimates are based on the results of surface soil measurements at 13 locations shown in Figure 2 of the Characterization Report and the results are reported in Table 3.4 of the Characterization Report.

The measured gamma exposure rates at the top of the pile were lower than would be expected based on radiological analyses of samples collected from the upper two feet of soil. Because the measured gamma exposure rates represent the actual exposure at the top of the pile, the average net uranium and thorium concentrations used for dose calculations were adjusted to match the actual measured exposure rates. The details of this assumption are described below.

The average net uranium and thorium concentration measured in near-surface soils is only slightly lower than the average through the entire pile; the measured exposure rates that are indicative of near-surface concentrations show that the actual average concentration is substantially lower. The average net activity concentration in surface soil samples from the top 2 feet of Boreholes 1, 3, 4, 5, 15, and 16 at the top of the slope is approximately 56 pCi/g total combined thorium and uranium, of which approximately 11.5 pCi/g is U-238 and 16.5 pCi/g is Th-232. This is only slightly less than the average measured through the entire pile, but the direct radiation exposure rate measured at the top of the pile is substantially less than would be expected for the concentration indicated by the near-surface soil analyses. The direct radiation exposure rate measurements are reported in Table 3.9 of the Characterization Report. The values reported there are gross values. As indicated in Section 3.4.4 of the Characterization Report, net values can be

obtained by subtracting a background of 6-7 μrem/h. Assuming a background of 6.5 μrem/h, the average net exposure rate at the top of the slope, based on measurements at Boreholes 1, 3, 4, 5, 15, and 16, is approximately 11.5 μrem/h at the top of the slope. This value is actually slightly below the average net value of approximately 12.3 μrem/h for slope face measurements at locations 1 through 25 (see Characterization Report Figure 2 and Table 3.9), for which the soil sample measurements indicate uranium and thorium concentrations at least a factor of 2 lower. Because direct exposure measurements are a better indicator of average near-surface soil concentrations for the nuclides of interest over broad areas with a limited number of measurements, it is reasonable to conclude that concentrations of uranium and thorium in near-surface soils at the top of the slope are about the same as concentrations measured on the slope, where the number of soil measurements is greater and direct exposure measurement results are about the same.

Based on the analysis above, it is assumed for the purposes of this assessment that the net average total uranium and thorium concentration in the near-surface (0 to 2-ft depth) slag/soil/debris mix on the embankment is approximately 25 pCi/g of combined thorium (Th-232 and Th-228) and uranium (U-238 and U-234). Of the 25 pCi/g total uranium and thorium, about 7.5 pCi/g is assumed to be thorium-232 and 5 pCi/g is assumed to be uranium-238. For deeper materials (greater than 2-ft deep), it is assumed that the net average total uranium and thorium concentration in deeper material slag/soil/debris mix is approximately 75 pCi/g of combined thorium and uranium, of which about 22.5 pCi/g is assumed to be thorium-232 and 15 pCi/g is assumed to be uranium-238. Progeny nuclides are assumed to be present in equilibrium.

River Road ROW Materials

Supplementary characterization work performed after completion of the initially submitted Radiological Assessment and Decommissioning Plan (Revision 0, August, 1998) included a topographic survey of the slag pile and additional radiological characterization of soils beyond the base of the slag pile. This work is described in the Report on Topographic and Radiological Surveys, Reading Slag Pile Site (STEP, 1999 and STEP, 2000). This work delimited the vertical and horizontal extent of slag present in the River Road ROW and provided a basis for estimating average radionuclide concentrations in the ROW soils containing slag. The maximum volume of slag/soil mix in the River Road ROW area is estimated to be approximately 10,000 to 20,000 ft^3.

The segment of the River Road ROW containing slag was found to be a small area less than 300 feet long and 50 feet wide and is located adjacent to the bottom of the slag pile, as shown in Figure 1-3. As can be seen in Figures 1-1 through 1-3, the setting of the ROW segment containing the slag of interest is itself a small, narrow, and, to a considerable extent, isolated strip of land. This strip is bounded on one side by the embankment that contains the slag pile and is bounded on its other side by, in succession,

railroad tracks, the remains of the Schuylkill Canal, and the Schuylkill River. Concrete bridge abutments at either end tend to further isolate the strip.

Radiological survey measurements made as part of the topographic and radiological survey noted above were direct measurements of radiation emitted from radionuclides in soils. After the completion of that work, soil samples from various depths were collected from three locations in the River Road ROW and were analyzed for radionuclide content. The results of these analyses are reported in the Decommissioning Plan (STEP, 2000).

Results of direct radiation measurements and measurements of nuclide concentrations in surface and subsurface soil samples from the slag pile are provided in the characterization report for the Reading slag pile (Cabot, 1996a and NES, 1996a and 1996b). Although most radiological measurements in the early Site characterization work were focused on the slag pile itself, some of the measurements were made at locations along the bottom of the slag pile near or in the River Road ROW. These include analysis of soil samples and measurement of direct radiation at a height of one meter above the ground at borehole locations B7 through B10. The locations of these points are not known with great accuracy, but are most likely close to the northern edge of the River Road ROW, as indicated in Figure 2 of the Characterization Report (NES, 1996a) and Figure 3-1 of the Hydrologic and Geologic Assessment (STEP, 1997b). Results of direct radiation measurements at these points are reported in the updated page 30 of the Characterization Report (NES, 1996b). Results of analysis of soil samples from all borehole locations are tabulated in Table 3.4 of the Characterization Report (NES, 1996a).

Results of more recent direct radiation measurements focused on the River Road ROW are reported in Table 1 of the Report on Topographic and Radiological Surveys, Reading Slag Pile Site (STEP, 1999). Results of analysis of three supplementary soil samples from the River Road ROW are listed in Table 1-2 of the Decommissioning Plan (STEP, 2000).

Taken as a whole, the radiological data from the River Road ROW indicate that average radionuclide concentrations in near-surface soils in the ROW are about the same as concentrations in near-surface soils on the slag pile slope. The maximum depth of elevated radionuclide concentrations in the ROW materials is about 1 to 2 feet.

The average net (background subtracted) activity concentration in the ROW near-surface soil is approximately 25 pCi/g of combined thorium (Th-232 and Th-228) and uranium (U-238 and U-234). (This net activity concentration is the result of subtraction of 2.6 pCi/g total uranium and 2.5 pCi/g total thorium from gross measurements, as explained in the Characterization Report.) Of the 25 pCi/g total uranium and thorium, about 7.5 pCi/g is thorium-232 and 5 pCi/g is uranium-238. Progeny from these two nuclides can be assumed to be present at equilibrium concentrations.

3.0 POTENTIAL EXPOSURE SCENARIOS

3.1 INTRODUCTION

The decision to terminate the NRC license for Reading without restrictions on use will depend on a finding that future exposure to residual radioactive materials at the Site would be within NRC limits for exposure of members of the public. Assessment of potential future exposure must include development of reasonably expected scenarios by which exposure to residual radioactive material might occur.

This section describes the development of Site-specific exposure scenarios for the assessment of maximum radiation doses that might result from unrestricted use of the Site.
NRC guidance documents were used to develop exposure scenarios and assumptions. The NRC guidance documents provide a framework for dose assessment that is fundamentally a screening approach that incorporates conservative assumptions, but is modified as appropriate, to incorporate important Site-specific considerations (USNRC, 1999a, USNRC, 1999b, Beyeler, 1998a, and Beyeler, 1999b).

In general, people could conceivably receive radiation doses from radioactive materials on the Site through either internal or external exposure. In external exposure, the body absorbs radiation emitted by radioactive material outside the body. For example, radioactive materials deposited on the ground surface can cause external exposure of a person standing on the surface if the radiation emitted is sufficiently penetrating to reach internal body tissues. In internal exposure, the body absorbs radiation emitted by radioactive material that has been introduced into the body by inhalation of radioactive material constituents in air, or by ingestion of radioactive material constituents in food or water. In general, the level of the radiation dose received decreases as the quantity of radioactive material available for exposure decreases, but the exact relationships are sometimes complex. External radiation exposure can be mitigated by dilution of the source material, by increasing the distance between the receptor and the source, by limiting exposure time, and by shielding, i.e., the placement of radiation-absorbing material between the receptor and the source. Internal exposure can be best mitigated by isolation or dilution of the source material to minimize inhalation or ingestion of radioactive material.

This Section begins with a general discussion of Site-specific considerations that are important in radiological assessment, then proceeds to more detailed discussions of the limited potential for migration of radioactive material in water and the limited potential for movement of the slag material from its present location, and concludes with definition of exposure pathways and exposure scenarios, based on the foregoing consideration of Site-specific features.

3.2 SITE-SPECIFIC CONSIDERATIONS

For the Reading Site, there are important Site-specific considerations that shape potential exposure scenarios. These have been considered, as described below, in the development of scenarios for potential radiation exposure to residual radioactive materials at the Reading Site.

The form, distribution, and location of the residual licensed radioactive materials at the Reading Site and other Site-specific features are important considerations in developing radiation exposure scenarios appropriate for evaluation to form a decision basis for terminating the NRC license with unrestricted use of the lands. As noted in Section 2.0, radioactive materials at concentrations distinguishable above background concentrations in soils were originally confined to discrete, highly stable pieces of slag, mixed with much larger volumes of non-radiological slag, rubble, and soil. Because the slag was broken up prior to disposal, some of the slag pieces are not easily separable from soil.

The distribution of the radiological slag also seriously limits the range of possible exposure scenarios. Much of the materials of potential radiological consequence are distributed in near-surface soils on a slope steep enough to preclude use for residential or agricultural purposes. Almost all of the remainder of the material of interest is distributed in near-surface soils on the top of the pile. Although, as explained in Section 1.0, this area is a long, narrow strip, with maximum dimensions of 15-ft wide by 162-ft along the edge of the embankment. The limited width, in particular, would be an important consideration in limiting potential exposure to the radioactive materials.

Leach testing of the slag, reported in the Decommissioning Plan, indicates extremely limited environmental availability. These results are consistent with results of monitoring of seepage from the slag pile (STEP, 1997b, STEP, 2000), which indicates that nuclide concentrations in water do not exceed EPA Drinking Water Standards and are, in fact, indistinguishable from background surface water samples collected form the Schuylkill River. The limited environmental availability of the licensed radionuclides in the slag is an important consideration in radiological dose assessment. Analytical results for groundwater samples collected from the wells in the ROW were also all within Drinking Water Standards.

The Decommissioning Plan provides a detailed description of the groundwater pathway analysis. In summary, the Site conditions preclude the possibility of any completed groundwater receptors.

- Radionuclide concentrations in leachate from the slag are below Drinking Water Standards. Migration and mixing can only lower the concentrations. Therefore, Drinking Water Standards can not be exceeded.

- The groundwater flow path between the slag and the river is limited to a shallow, thin, short zone unsuitable for installation of a well.

- There is insufficient yield downgradient of the slag to support even a domestic supply well.

- The total volume of the infiltration through the slag and subsequent leachate could represent only a miniscule fraction of the volume of an industrial or water supply well in the bedrock resulting in dilution of constituents from the slag to background levels.

- It is unlikely that the bedrock will be developed for use as a water supply source.

In conclusion, there are no current or future completed groundwater pathways and there is no groundwater contamination associated with the Site.

Other Site-specific features are also important. For example, the slag pile is located within an urban area on a property formerly used, and currently zoned for, heavy industry. Abandoned industrial facilities remain on the property. Communications with the City of Reading indicate the City's intent to redevelop the industrial property for industrial/commercial and related uses. For this reason, future residential use of the land in the vicinity of the slag pile is highly unlikely.

A detailed discussion of the limitations of potential future uses of the Site and industrial property is contained in Section 1.5.1 of the Decommissioning Plan (STEP, 2000). As shown in cross section BB' (Figure 3-1), the current topography of the industrial property is optimal for industrial or commercial redevelopment and would likely be maintained in it's current configuration. Figure 3-1 also shows that the radiological slag occupies only a small portion of the industrial property in terms of area and volume fraction of fill.

Some of these considerations work together. For example, a use of the land that would result in use of groundwater does not appear viable. Residential or agricultural uses, uses that would most likely incorporate groundwater use, would not be consistent with past and likely future uses of the land. The physical distribution of the radioactive materials on a slope and in a ribbon of flat area at the top tends to make them unavailable for residential or agricultural purposes. Even if such uses occurred, the limited environmental availability of nuclides in the slag would limit concentrations of radionuclides in groundwater to negligibly low levels. The City of Reading has indicated that future development on the industrial property will be required to connect to the City's public water supply system. In addition, analytical results for groundwater samples collected from immediately downgradient of the Site are all below the primary drinking water standards for radiological constituents (STEP, 2000). Thus, for a number of reasons, exposure through groundwater pathways need not be evaluated explicitly.

Additional Site-specific considerations are important for the ROW material in particular. The materials of potential radiological consequence are distributed in near-surface soils in a road right-of-way. The possibilities for development of the ROW segment of interest are limited. The ROW segment containing the slag is itself small, less than 300 feet long and 50 feet wide. It is contained within a small, narrow strip of land that is, to a considerable extent, isolated by geographical features. This strip is bounded on one side by an embankment, of which the slag pile forms a part. The strip is bounded on its other side by railroad tracks, the remains of the Schuylkill Canal, and the Schuylkill River. Concrete bridge abutments at either end further tend to isolate the strip of land containing the ROW segment of interest. For these reasons, future residential use or agricultural use of the land in the vicinity of the ROW segment is not practical.

All of these considerations, taken together, tend to shape the radiation exposure scenarios that might reasonably be expected in the near or even distant future. In particular, direct application of commonly used generic exposure scenarios developed for screening purposes is not appropriate for this Site.

3.3 DETERMINATION OF NUCLIDE CONCENTRATIONS IN LEACHATE

In the context of this analysis, wherein no groundwater exposure pathways are included in the exposure scenarios, understanding of nuclide leaching behavior is important only in the qualitative sense. It is useful in assuring that nuclide concentrations in water seeping from the slag pile will be low, but monitoring data already demonstrate that. It is also useful in assessing the rate of depletion of the radiological source. However, over a very broad portion of the range of likely source depletion rates, uncertainty in depletion rate will affect uncertainty in the estimate of radiation dose negligibly. This is because, in the way the analysis was designed, the maximum calculated annual dose occurs at the outset of the 1,000-year period of analysis. The depletion rate will only affect the time at which the calculated annual dose begins to fall from its maximum but will not affect the magnitude of the maximum annual dose. Nonetheless, as described below, Site-specific leaching data were developed for application in this analysis.

For dose calculation purposes, uranium leaching was modeled as a desorption process in which the uranium concentration in the leachate was assumed to be directly proportional to the concentration in the solid source. The value selected for K_d, the ratio of uranium concentration in solid to uranium concentration in leachate - commonly called the distribution coefficient, was adjusted so that the dose model would produce a leachate uranium concentration equal to the readily available uranium (RAU) concentration measured in leaching tests on slag from the Reading Site. These leach tests consisted of exposure of ground-up samples of representative slag to highly acidic leaching conditions that are far more aggressive than would be encountered in the natural environment. The experimental leach solutions were at least 10 times more acidic than natural waters. The concentrations of dissolved nuclides measured in such a test are far higher than would be expected from leaching into natural waters percolating through the slag materials. The

raw data from the leach test is provided in Appendix A. The use of these data in the derivation of the uranium K_d value for use in the dose model is shown in Table 3-1.

The derivation in Table 3-1 is fully consistent with the interpretation of leach test data by Environmental Resources Management, Inc. (ERM), which has been submitted to NRC previously (Cabot, 1996d). Specifically, the initial leachate uranium concentration calculated in the dose model, using the K_d value calculated in Table 3-1 and the uranium concentration of approximately 10 pCi/g (U-238 and U-234 combined) derived as the minimum average uranium concentration over the material of interest, matches the initial leachate concentration derived by ERM, 0.0226 ppm, or 15.8 pCi/L.

The leach test methodology and the ERM interpretation methodology used for the Reading slag leach test was approved by the NRC staff (USNRC, 1997).

Uranium progeny nuclides were assumed to be present in leachate in equilibrium with the uranium parent. This assumption implicitly assumes congruent leaching. As noted in Section 1.5.1 of the Decommissioning Plan (STEP, 1998), leaching would be incongruent, with concentrations of important uranium progeny in leachate lower than concentrations of uranium. Thus, assumption of equilibrium and congruent leaching results in conservatively high estimates of progeny nuclide concentrations in leachate. However, the derived K_d values for these nuclides remain high enough that depletion of these nuclides from the source would be slow enough to assure that calculated maximum annual doses from water-independent pathways would not be underestimated.

The K_d value derived for uranium for dose calculations was also used for the thorium chain. As explained in the ERM analysis, a higher K_d value for thorium and its progeny nuclides, which would result in a lower concentration of those nuclides in leachate, would be warranted based on data from experiments of sorption/desorption using various materials from other sites. Therefore, use of the same K_d value as that derived for uranium would result in conservatively high concentrations of thorium and progeny nuclides in leachate, as calculated in the dose model. Again, the derived K_d values for these nuclides remain high enough that depletion of these nuclides from the source would be slow enough to assure that calculated maximum annual doses from water-independent pathways would not be underestimated.

3.4 MOVEMENT OF SLAG

The low likelihood for movement of slag to other locations is a factor in the development of exposure scenarios and is discussed in this subsection.

Off-Site Movement of Slag

The potential for the slag to be removed from the Site and placed in a location that is suitable for residential development or farming uses was considered. Although it is physically possible to move the radiological slag to an off-site location, it is

inconceivable that it could end up in a configuration that would lead to greater exposure than that at the Site. For the exposure to be greater, the radiological slag would have to be selectively excavated and separated from non-radiological slag, moved to a new location, and selectively spread across a surface area larger than the Site. Even if the slag were moved the same characteristics that limit the potential exposure on-site would limit the off-site exposure.

As discussed below, the use of the radiological slag as a growing media for farming, turf, or for a residential garden is an unreasonable assumption. There are several factors that each and in itself would prevent that from occurring. Taken together, it is virtually impossible for off-site movement of the slag to result in doses of concern. The following factors are critical for evaluating the potential off-site exposure.

Physical Characteristics

The slag itself is a glassy granular material. It has little moisture retention and no organic humus material. The radiological slag and non-radiological slag at the Reading Site is mixed with other materials not related to Cabot's activities including:

- Concrete slabs greater than 10-feet by 10-feet by 1-foot thick
- Metal trash and debris including structural steel, pipes, wires, hoses, spikes, nails, household items, batteries, pails, bricks, carbon electrodes, wooden timbers, and general commercial industrial and residential trash
- Non-radiological slag that is nearly identical in origin and appearance to the radiological slag

At the Reading Site, only drought tolerant weedy species of trees and brush are able to survive on the slope where approximately 2 feet of material covers the slag. Pure slag does not support any but the hardiest weedy species of plants, if any. The slag is not suitable as a growing medium for crops or turf.

The debris mixed in with the slag severely limits its use. The large objects imbedded in the fill would impede grading to proper slope, tilling, plowing or harvesting any crop, and maintaining a lawn. The smaller nails and spikes would be a deterrent to using the material as surface cover for industrial residential or agricultural use because of the risk of puncturing tires on vehicles and equipment. The material is not aesthetically acceptable for any intentional residential, commercial, or industrial use.

Standards of Construction Practice

Certain standards of construction practice for residential, commercial, and industrial development projects are ubiquitous to Pennsylvania. As much as possible a construction/development uses on-site materials for shaping and grading. During planning stages engineers calculate and match the volume of excavation (cut) and fill to avoid the expense and uncertainties associated with importation or disposal of fill. If present, on-site topsoil is first stripped and stockpiled for later use for final grading. During excavation activities, the select soil (soil that does not contain rocks, boulders, debris, waste, or slag) is also typically separated from the non-select material (subsoil, rocks, boulders, debris, and waste fill such as slag). The non-select material is then used for the rough grading and backfill. The select material is used for final grading and the topsoil is then spread across areas that will be vegetated. If topsoil is not available onsite then it is imported from an offsite location. Slag or trash and debris are not used as the final cover for areas scheduled for vegetation. The only locations where slag/debris is left as the surface material are heavy industrial sites where the activities will consist of handling and storage of equipment, bulk materials, or junk. Typically slag and debris materials end up buried or on an embankment away from the regularly used sections of the site, such as the current situation at the Reading industrial property.

Economics

The desire for a visually pleasing and vegetated site is reflected by the effort and cost expended to provide topsoil for all residential and commercial site development. The cost to import topsoil typically ranges from approximately five dollars per cubic yard for large projects to more than ten dollars per cubic yard for homeowners. Five dollars per cubic yard equates to over $4,000 for covering an acre with 6 inches of topsoil. The cost to excavate and ship the slag would cost several dollars per cubic yard. The cost of excavating and shipping slag and debris generally precludes its use as fill. It is inconceivable that a landowner would pay to import undesirable slag and debris for the final cover at a site when the cost for topsoil is only incrementally greater and results in an acceptable site for development or sale.

In essence, material such as this is does not have any aesthetic, economic, or valuable use; it almost always exists as an on-site waste in piles or as subsurface fill. In addition, current environmental regulations (Pennsylvania Residual Waste Regulations) generally prohibit the use of waste slag for offsite fill. Therefore, slag and debris typically remain on the site of origin or are disposed of at a landfill if there is a need for removal.

Logistics

In the unlikely event that slag from the Reading Site were to be relocated in the future, the process would affect relative distribution of radiological slag relative to the non-radiological slag. The radiological slag and debris are indistinguishable from the non-radiological slag and debris without the use of sensitive instruments or laboratory

analyses. Excavation of slag from the Reading Site would be indiscriminant resulting in thorough mixing of radiological and non-radiological slag. The estimated volume of radiological slag and debris (including intermixed non-radiological slag) is less than 180,000 cubic feet. The estimated volume of non-radiological slag on the industrial property is approximately 3,000,000 cubic feet. Therefore, the result of excavation, shipping, and placement of the slag to a different location would most likely result in a greatly reduced average concentration of radiological constituents.

It is possible that there could still be some small volumes (limited to the size of one truckload) of slag that would be at or near the same concentration as currently exists in the radiological slag pile. At the destination site, these volumes of radiological slag would be distributed as zones scattered throughout the fill in three dimensions (raisin bread provides a useful analogy). The "raisins" would most likely be embedded in the fill and not exposed at the surface. In the few locations where it was exposed at the surface the size of the area would be less than the size of the area modeled for the on-site dose assessments. If the receiving site was residential or commercial, it is certain that slag would be covered with topsoil before use. If it was a heavy industrial site the uses would be similar to the Reading Site and the surface area and concentration of radiological slag would be substantially less than at the Reading Site. Therefore, the potential exposure would also be substantially less.

On-Site Movement of Slag

Excavation and relocation of slag within the industrial property would have the same affects as offsite relocation of slag. The result would be lower average concentrations, smaller areal extent, and likely cover with soil if the industrial property were developed for residential or commercial use. Because of the current location of the slag on an embankment, the radiological slag would likely be buried beneath non-radiological slag. Any development of the areas containing radiological slag would result in a cover of soil or pavement. Either scenario greatly reduces the already low calculated potential dose.

Conclusions Regarding Movement of Slag

The above considerations lead to the following conclusions regarding the potential for relocation of slag materials:

- Offsite relocation of the slag is very unlikely and would result in reduced exposure, concentration, and potential dose.

- On-site redistribution of slag would result in reduced exposure, concentration, and potential dose.

Consequently, exposure scenarios appropriate for evaluation of this Site are confined to those that assume the material remains in place.

3.5 EXPOSURE SCENARIO AND PATHWAY DEFINITION

License termination decisions can sometimes be based on analysis using simplified generic screening exposure scenarios. Screening exposure scenarios are based on conservative exposure assumptions that typically cause doses to be overestimated. While they may be useful for screening purposes, they are not suitable representations of exposure scenarios that might reasonably be expected to arise at the Reading Site. In particular, the location, size, and physical arrangement of the slag material and its setting on an industrial property preclude resident and resident-farmer exposure scenarios. In such scenarios, it would be assumed that the resident spends a very large fraction of his time and raises a large portion of his food, including meat and milk, on the land bearing the licensed radioactive material. These activities would not be practical, given Site conditions and physical characteristics of the slag material. Site specific exposure scenarios were developed separately for the slag pile material and the ROW material.

3.5.1 Slag Pile Area

Development of scenarios for analysis recognizes that the Slag Pile Area is not likely to be used for any particular purpose. Some kind of occasional recreational or occupational use may be feasible, but even in those scenarios, exposure time would be small. The areas containing radioactive materials do not lend themselves very well to either recreational or occupational uses. The slope is too steep and the flat portion is too small and too close to the edge of the embankment. The only potential exposure pathways would be those that might involve some walking over the areas.

Two basic exposure scenario types were developed for purposes of the Slag Pile Area analysis. The first of these was a trespasser who walks on the Site, and the second a worker who works in a building on the Site and who occasionally walks on the Site. Each of these scenarios was analyzed for two Site radiological conditions—current conditions and possible future conditions.

Radionuclide concentrations in surface soils on the slope of the pile are likely to be significantly lower than concentrations in deeper soils on the slope. The radiation dose that might be received by a person using the Site depends strongly on the radionuclide concentrations in soils near the surface. Although likely uses of the top of the slope would assure that erosion would not lead to exposure of subsurface soils higher in radionuclide concentration than near-surface materials, such automatic controls may not be present for materials on the slope. For this reason, two variations of each of the two basic scenarios were analyzed. In the first, the trespasser or worker was assumed to be exposed to concentrations representative of current conditions. In the second, the trespasser or worker was assumed to be exposed to soils bearing radionuclides expected to be more typical of deeper soils on the slope. This scenario implicitly incorporates the unrealistic assumption that substantial erosion occurs within a short time after release for unrestricted use. As presented in the Decommissioning Plan, the slope is stable and this

scenario is not likely to occur. This variant can be considered to be conservatively representative of possible (albeit unlikely) future conditions at the Site, assuming substantial erosion has occurred on the slope.

Thus, four scenarios were developed for the Slag Pile Area. For purposes of easy identification, they are named, trespasser—current conditions (TC), trespasser—eroded slope (TE), worker—current conditions (WC), and worker—eroded slope (WE). The trespasser is assumed to spend 3 hours per week for 6 months of the year on the slope in the area where radioactive materials are located. In the current slope condition case, (TC) it is assumed that he is exposed to soils containing 7.5 pCi/g Th-232 and 5 pCi/g U-238 with each of their progeny nuclides present in equilibrium concentrations (25 pCi/g total uranium and thorium). In the eroded slope condition case, it is assumed that he is exposed to soils containing 22.5 pCi/g Th-232 and 15 pCi/g U-238 with each of their progeny nuclides present in equilibrium concentrations (75 pCi/g total uranium and thorium). The worker is assumed to spend 200 hours per year (10% of his total annual work time) on the Site in the area where radioactive materials of interest are located. Of this 200 hours, it is assumed that he spends 20 hours per year on the slope and 180 hours per year in a small structure on top of the pile. The geometry of the pile dictates that the structure on radioactive materials at the top of the pile be small. This would undoubtedly be a factor in limiting the fraction of his time in the areas where radioactive materials are located. For purposes of analysis, it is assumed that the structure is 15-ft by 15-ft with a 6-in concrete floor. Floor shielding and the limited extent of the areal source at the top of the pile would limit direct radiation exposure. Time spent in the building would also tend to limit exposure from inhalation of dust containing radioactive material and ingestion of soil containing radioactive material. As for the trespasser scenarios, in the current slope condition case, (TC) it is assumed that he is exposed to soils containing 7.5 pCi/g Th-232 and 5 pCi/g U-238 with each of their progeny nuclides present in equilibrium concentrations. In the eroded slope condition case, it is assumed that he is exposed to soils containing 22.5 pCi/g Th-232 and 15 pCi/g U-238 with each of their progeny nuclides present in equilibrium concentrations. Substantial erosion of the flat surface at the top of the pile was assumed not to occur because maintenance of a structure usable by workers would dictate that such erosion be prevented or repaired. Therefore, it is assumed that soils at the top contain 7.5 pCi/g Th-232 and 5 pCi/g U-238 with each of their progeny nuclides present in equilibrium concentrations.

Because radon-222 and radon-220 are progeny of the uranium-238 and thorium-232 decay chains, respectively, inhalation of radon daughter products is a possible radiation exposure pathway at this Site. However, because radiation doses from these nuclides are best controlled by measures commonly incorporated in new structures, radiation doses from these nuclides have been excluded from the new radiological criteria for decommissioning, and are not included in this assessment. This approach is consistent with current NRC radiological criteria for license termination in 10 CFR 20, Subpart E.

The set of exposure scenarios for consideration in dose assessment was developed based on the nuclides of interest, the anticipated distribution of the nuclides on the Site,

reasonably likely potential uses of the Site, and potential environmental migration pathways. A list of all of the exposure pathways warranting analysis for one or more of the base case scenarios is provided below:

1. Ground - Direct radiation from material in soil

2. Dust - Resuspension of surface particulate material (air inhalation)

3. Soil - Ingestion of soil

Although exposure pathways may be the same for different exposure scenarios, values for key parameters, such as Site occupation time, may differ between scenarios.

There are certain analytical elements common to all the Slag Pile scenarios analyzed:

- Use of gamma measurements for source characterization: Measured gamma exposure rates indicate that average concentrations of licensed radioactive material in the near-surface slag/rubble at the top of the pile are lower than those derived from measurements of concentrations in soil samples. For purposes of this analysis, concentration estimates were adjusted to be consistent with measured gamma exposure rates.

- Exclusion of radon pathways from evaluation for reasons described above

- Use of specially computed ground dose reduction factor: MICROSHIELD was used to compute a ground dose reduction factor to account for the combined effects of limited source dimensions and shielding from the worker's structure. The structure is assumed to be 15-ft x 15-ft with a 6-in concrete slab floor located at the center of the ribbon of slag that forms the top of the pile. The worker is presumed to work at the center of the structure. No reduction was considered from shielding in the walls. Details of the MICROSHIELD calculations are provided in Appendix C. As explained in Appendix C, the calculated factor (ratio of shielded dose from limited area source to unshielded dose from infinite area source) is 0.19, which was used to develop appropriate shielding factor input for RESRAD. Because the specially calculated reduction factor incorporates the effect of limited source area, the source area, as input to RESRAD, was assumed to be effectively an infinite area, 10,000 square meters, to prevent RESRAD from computing and applying an additional limited area correction factor.

- Use of recently released Sandia reports for certain parameters: Two recently released Sandia reports constitute the most current available NRC guidance for default parameter values for use in environmental radiation dose assessment. For this reason, they were used to aid in selecting

appropriate values for certain parameters (Beyeler, 1998a and 1998b). They were used in particular as the basis for selecting a value of 1.4 m^3/h (12,200 m^3/y) as a breathing rate appropriate for light-to-moderate activity that would be expected for the scenarios evaluated in this assessment. In addition, they were used to support the use of RESRAD default values for the soil ingestion rate (0.1 g/d or 36.5 g/y), dust mass loading for inhalation (0.0002 g/m^3), and the shielding factor for inhalation, (0.5). In addition, although the specially calculated ground dose reduction factor, described above, was developed before the release of the Sandia reports, the shielding factor information in the Sandia reports was reviewed for compatibility. In general, the consideration of shielding in the specially calculated factor for this analysis is consistent with information and methodology described in the Sandia reports. However, it is important to note that the special factor calculated for this analysis also incorporates source geometry considerations, unlike the factors discussed in the Sandia reports, which address only shielding from an infinite area source.

- Use of input parameter values from RESRAD default values, except as noted: Default RESRAD parameter values were used for many parameters, generally those that do not influence the dose estimate significantly for the scenarios of interest. Site-specific values were determined for occupation times, which influence the dose estimate most significantly. Complete lists of parameter values are provided in the RESRAD documentation (Yu, 1993a Yu, 1993b).

- Calculation of source depletion by use of measured uranium leach concentration and assumption of progeny equilibrium in leachate as described in section 3.3.

The key assumptions for each of the exposure scenarios analyzed for the Slag Pile Area are summarized in the Table 3-2.

3.5.2 River Road ROW Area

Generic screening exposure scenarios based on conservative exposure assumptions that typically cause doses to be overestimated may be useful for rapid screening purposes, but are not suitable representations of exposure scenarios that might reasonably be expected to arise at the River Road ROW. In particular, the location, size, and physical arrangement of the material of interest preclude resident and resident-farmer exposure scenarios. In screening scenarios, it would be assumed that the resident spends a very large fraction of his time and raises a large portion of his food, including meat and milk, on the land bearing the licensed radioactive material. These activities would not be practical, given Site conditions and physical characteristics of the slag material.

Development of scenarios for analysis recognizes the limited potential uses of the ROW segment. The most severe exposure scenarios would likely involve some kind of occasional recreational or some occupational use involving excavation. Even in those scenarios, exposure time would be small.

Two basic exposure scenario types were developed for purposes of analysis. The first of these was a recreational walker who routinely walks on the ROW segment for exercise or pleasure. The second is a worker who participates in excavation in the ROW segment. For purposes of easy identification, they are named walker and worker. The walker is assumed to spend 5 minutes each day for 200 days (17 hours per year) each year walking over the segment. The worker is assumed to be exposed to the ROW segment material in the course of a 40-hour excavation project.

Because radon-222 and radon-220 are progeny of the uranium-238 and thorium-232 decay chains, respectively, inhalation of radon daughter products is a possible radiation exposure pathway at this Site. However, because radiation doses from these nuclides are best controlled by measures commonly incorporated in new structures, radiation doses from these nuclides have been excluded from the new radiological criteria for decommissioning, and are not included in this assessment. This approach is consistent with current NRC radiological criteria for license termination in 10 CFR 20, Subpart E.

The set of exposure scenarios for consideration in dose assessment was developed based on the nuclides of interest, the actual and anticipated distribution of the nuclides on the Site, reasonably likely potential uses of the Site, and potential environmental migration pathways. A list of all of the exposure pathways warranting analysis for one or more of the base case scenarios is provided below:

1. Ground - Direct radiation from material in soil

2. Dust - Resuspension of surface particulate material (air inhalation)

3. Soil - Ingestion of soil

Although exposure pathways may be the same for different exposure scenarios, values for key parameters, such as occupation time, may differ between scenarios.

Two recently released Sandia reports constitute the most current available NRC guidance for default parameter values for use in environmental radiation dose assessment. For this reason, they were used to aid in selecting appropriate values for certain parameters (Beyeler, 1998a and 1998b). They were used in particular as the basis for selecting appropriate values for breathing rates for the walker and worker scenarios. A value of 1.4 m^3/h (12,200 m^3/y) was selected as a breathing rate appropriate for light-to-moderate activity that would be expected for the walker scenario. A value of 2.0 m^3/h (17,400 m^3/y) was selected as the breathing rate appropriate for heavy activity that might be expected for the excavation worker scenario. These reports were also used to support the

use of RESRAD default values for the soil ingestion rate (0.1 g/d or 36.5 g/y) and the dust mass loading for inhalation for the walker (0.0002 g/m^3) and worker (0.0007 g/m^3, near the upper limit for respirable particles) as reasonably conservative values for these parameters.

Default RESRAD parameter values were used for many parameters, generally those that do not influence the dose estimate significantly for the scenarios of interest. Site-specific values were determined for occupation times, which influence the dose estimate most significantly. Complete lists of parameter values are provided in the RESRAD documentation (Yu, 1993a Yu, 1993b).

The key assumptions for each of the exposure scenarios analyzed for the River Road ROW are summarized in the Table 3-3.

TABLE 3-1
DERIVATION OF K_d VALUES FROM LEACH TEST DATA

Derive pseudo-Kd to apply to slag
for RESRAD runs. Assume U-238 and U-234 in mix at 5 pCi/g each.
Define Kd to produce leachate concentration equal to that
measured in leach test.

DATA (concentrations from Appendix A,
other data from Cabot, 1996a, 1996b, 1996c, and 1996d)

SLAG

676	CSU, U, ug/g as rcd
316	CSAC, Ac-228, pCi/g dry
2.17	CSBI, Bi-212, pCi/g dry
297	CSPB, Pb-212, pCi/g dry
105	CSTL, Tl-208, pCi/g dry

LEACHATE

6.9	U, ug/g OXSU4
1.68	U, ug/g OXSU6
8.93	U, ug/g OXSUT
1.81	RAU, readily available uranium, ug/g slag
0.201	SAU, slowly available uranium, ug/g slag
85.8	TAU, total available uranium, ug/g slag
80	VRAU, total liquid contact volume for RAU test, mL
1	SMRAU, slag mass for RAU test, g

CALCULATED RESULTS

2.26E-02	CLRAU, U conc in liq phase RAU test, ug/ml CLRAU=RAU/VRAU
1.53E+01	ALRAU, U conc in liq phase RAU test, pCi/L ALRAU=CLRAU*1000 mL/L*6.75E-1 pCi/ug
655	KDMX, distribution coefficient for uranium in mix, mL/g KDMX=(5+5)/ALRAU*1000

A value of 655 mL/g for the contaminated zone Kd in RESRAD
with a source concentration of 5 pCi/g each of U-238 and U-234
will produce leachate at 15.8 pCi/L or 0.0226 ug/ml as measured
in the leach test

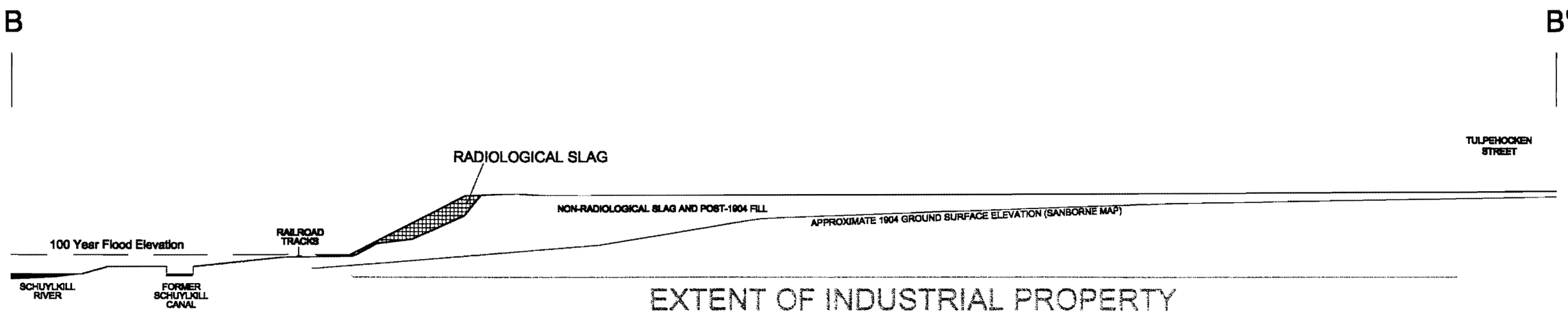
TABLE 3-2
SCENARIO PATHWAYS AND KEY PARAMETER VALUES
SLAG PILE AREA

	SCENARIO			
PATHWAY ASSUMPTIONS	TC Trespasser--current conditions	WC Worker--current conditions	TF Trespasser--future conditions	WF Worker--future conditions
General Description	Trespasser walks on slope in current condition 3 h/wk, 6 mo/y	Worker works on radiological area 10% of his work time, 200 h/y, of which 20 h/y is walking on slope in current condition, 180 h/y is in building with 6" concrete floor on top of pile.	Trespasser walks on slope in eroded condition 3 h/wk, 6 mo/y	Worker works on radiological area 10% of his work time, 200 h/y, of which 20 h/y is walking on slope in eroded condition, 180 h/y is in building with 6" concrete floor on top of pile.
Water-independent pathways				
External	Yes	Yes	Yes	Yes
Indoor exposure time (h/y)	NA	180 (top)	NA	180 (top)
Structural shielding factor	NA	0.19	NA	0.19
Outdoor exposure time (h/y)	72 (slope)	20 (slope)	72 (slope)	20 (slope)
Inhalation (dust)	Yes	Yes	Yes	Yes
Indoor exposure time (h/y)	NA	180 (top)	NA	180 (top)
Structural shielding factor	NA	0.5	NA	0.5
Outdoor exposure time (h/y)	72 (slope)	20 (slope)	72 (slope)	20 (slope)
Inhalation rate (m3/y)	1.22E+04	1.22E+04	1.22E+04	1.22E+04
Mass loading (g/m3)	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Inhalation (radon)	NA	NA	NA	NA
Ingestion of vegetables	NA	NA	NA	NA
Ingestion of meat	NA	NA	NA	NA
Ingestion of milk	NA	NA	NA	NA
Ingestion of soil	Yes	Yes	Yes	Yes
Outdoor exposure time (h/y)	72 (slope)	20 (slope)	72 (slope)	20 (slope)
Soil ingestion rate (g/y)	36.5	36.5	36.5	36.5
Water-dependent pathways				
Ingestion of water	NA	NA	NA	NA
Ingestion of aquatic food	NA	NA	NA	NA
Ingestion of vegetables (irrigated)	NA	NA	NA	NA
Ingestion of meat (irrigated)	NA	NA	NA	NA
Ingestion of milk (irrigated)	NA	NA	NA	NA
Inhalation (radon from water)	NA	NA	NA	NA

NOTES: All Scenarios - Concentration on top of pile = 25pCi/g total uranium and thorium
Current Scenario - Concentration on slope = 25pCi/g total uranium and thorium
Future Scenario - Concentration on slope = 75pCi/g total uranium and thorium

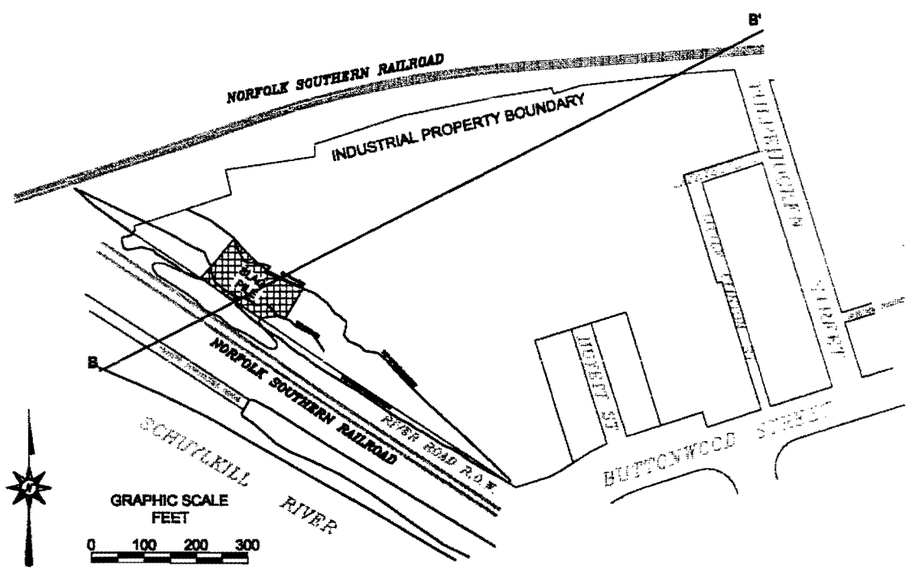
TABLE 3-3
SCENARIO PATHWAYS AND KEY PARAMETER VALUES
RIVER ROAD ROW AREA

	SCENARIO	
PATHWAY ASSUMPTIONS	RDRWWLK ROW Walker	RDRWWRK ROW Worker
General Description	Walks 5 min/d, 200 d/y, in area of ROW containing radionuclides	Excavates 40 h/y in area of ROW containing radionuclides
Water-independent pathways		
External	Yes	Yes
Indoor exposure time (h/y)	NA	NA
Structural shielding factor	NA	NA
Outdoor exposure time (h/y)	17	40
Inhalation (dust)	Yes	Yes
Indoor exposure time (h/y)	NA	NA
Structural shielding factor	NA	NA
Outdoor exposure time (h/y)	17	40
Inhalation rate (m3/y)	1.22E+04	1.74E+04
Mass loading (g/m3)	2.00E-04	7.00E-04
Inhalation (radon)	NA	NA
Ingestion of vegetables	NA	NA
Ingestion of meat	NA	NA
Ingestion of milk	NA	NA
Ingestion of soil	Yes	Yes
Outdoor exposure time (h/y)	17	40
Soil ingestion rate (g/y)	36.5	36.5
Water-dependent pathways		
Ingestion of water	NA	NA
Ingestion of aquatic food	NA	NA
Ingestion of vegetables (irrigated)	NA	NA
Ingestion of meat (irrigated)	NA	NA
Ingestion of milk (irrigated)	NA	NA
Inhalation (radon from water)	NA	NA



GRAPHIC SCALE

0 100 200



LOCATION OF CROSS SECTION BB' IN PLAN VIEW

FIGURE 3-1
CROSS SECTION BB'

Reading Slag Pile Site
Cabot Corporation

ST Environmental Professionals, Inc.
March 2000, Project No. 97C057

4.0 DOSE ASSESSMENT METHODOLOGY

Potential future radiation doses are computed from estimates of potential intake rates and exposure rates. Radiation doses from internal exposure (inhalation or ingestion) are computed using dose factors developed using current methodology, specifically those in Federal Guidance Report 11 (USEPA, 1988). In conformance with this guidance, the term "dose," as it is used in this report, means "committed effective dose equivalent" (CEDE) in reference to doses from internal exposure, "deep dose" in reference to external exposure, and "total effective dose equivalent" (TEDE) in reference to combined internal and external exposure. Annual doses totaled over all applicable exposure pathways are computed for each of a number of times after license termination for each potentially important receptor. In this analysis, annual doses were evaluated at 0, 1, 3, 10, 30, 100, 300, 500, 700, and 1,000 years after license termination. The RESRAD code includes capability to compute the peak annual dose if the peak falls between times specified for analysis. Results for each of these periods are tabulated in the RESRAD output in Appendix D. For this assessment, the peak calculated annual dose within the 1,000-year period of interest was the quantity selected to compare against NRC criteria for unrestricted release.

The computation of nuclide concentrations in media and radiation doses associated with exposure to those media is complex, and is usually performed using computer codes designed for the purpose. The RESRAD code (Gilbert, 1989 and Yu, 1993) was selected as suitable for evaluation of all pathways in the analysis. The version used was Version 5.91; the latest available at the time the analysis was performed.

The two Slag Pile Area worker scenarios result in exposure to two sources, material on the slope and material at the top of the slope. For each of these scenarios, separate RESRAD runs were made for each source. The total dose from all exposure was computed as the sum of the doses calculated in the two RESRAD runs.

The methodologies for the two River Road ROW scenarios were comparable to the methodology used for the primary analysis scenarios, but differed in several small ways:

- The analysis for the two River Road ROW scenarios consists of one RESRAD run for each of the scenarios.

- A feature of RESRAD that allows for dilution of resuspended dust by dust transported from off-Site was not used for the ROW worker scenario, but was used for all other scenarios. This feature was judged to be appropriate for use in scenarios where resuspended dust levels were near typical ambient levels (i.e., all scenarios except the ROW worker). The feature was considered inappropriate for scenarios in which dust levels were assumed to derive primarily from a small, localized source (i.e., excavation activities in the ROW worker scenario). This approach is considered to yield reasonably conservative estimates of dose for all scenarios.

5.0 RESULTS

Complete listings of the summary output data file for each RESRAD run are provided along with the output in Appendix D. Each output data file also lists the input data used.

The results of the RESRAD analysis of the four Slag Pile Area and two ROW area exposure scenarios (total dose (TEDE)) are provided in Table 5-1. The table identifies RESRAD runs serving as the source of the results listed. Some intermediate results are included to make the process more visible. As indicated in Table 5-1, ground dose contributes a large portion of the total dose for each scenario. Inhalation dose accounts for practically all of the remainder. The calculated total doses (TEDE) for the trespasser scenarios are presented in graphical form in Figure 5-1. The worker scenarios are depicted in Figure 5-2. The ROW Area results are depicted in Figure 5-3. All six scenarios are summarized in Figure 5-4. Examination of the detailed RESRAD output indicates that annual doses (TEDE) do not change significantly over the 1,000-year period of interest. This is because nuclides contributing to measured direct radiation, the primary exposure pathway, are long-lived.

The maximum dose (TEDE) calculated for the trespasser under current conditions is 1.5 mrem/y. Under eroded slope conditions, the trespasser would receive a maximum dose (TEDE) of 4.4 mrem/y. A worker spending 10% of his work time in the radiological area under current conditions would receive a maximum dose (TEDE) of 1.2 mrem/y. The maximum dose (TEDE) calculated for the worker under eroded slope conditions is 2.0 mrem/y.

Maximum doses (TEDE) of 0.32 mrem/y and 1.7 mrem/y were calculated for the recreational walker and worker in the River Road ROW scenarios. These doses are comparable to or less than doses calculated for the Slag Pile Area analysis scenarios, indicating that the Slag Pile Area scenarios are suitable representatives of other scenarios that might be identified for the Site.

In summary, the maximum dose (TEDE) calculated for any of the four scenarios evaluated is 4.4 mrem/y. Maximum calculated doses vary only slightly over the 1,000-year time period of interest.

TABLE 5-1
RESULTS SUMMARY

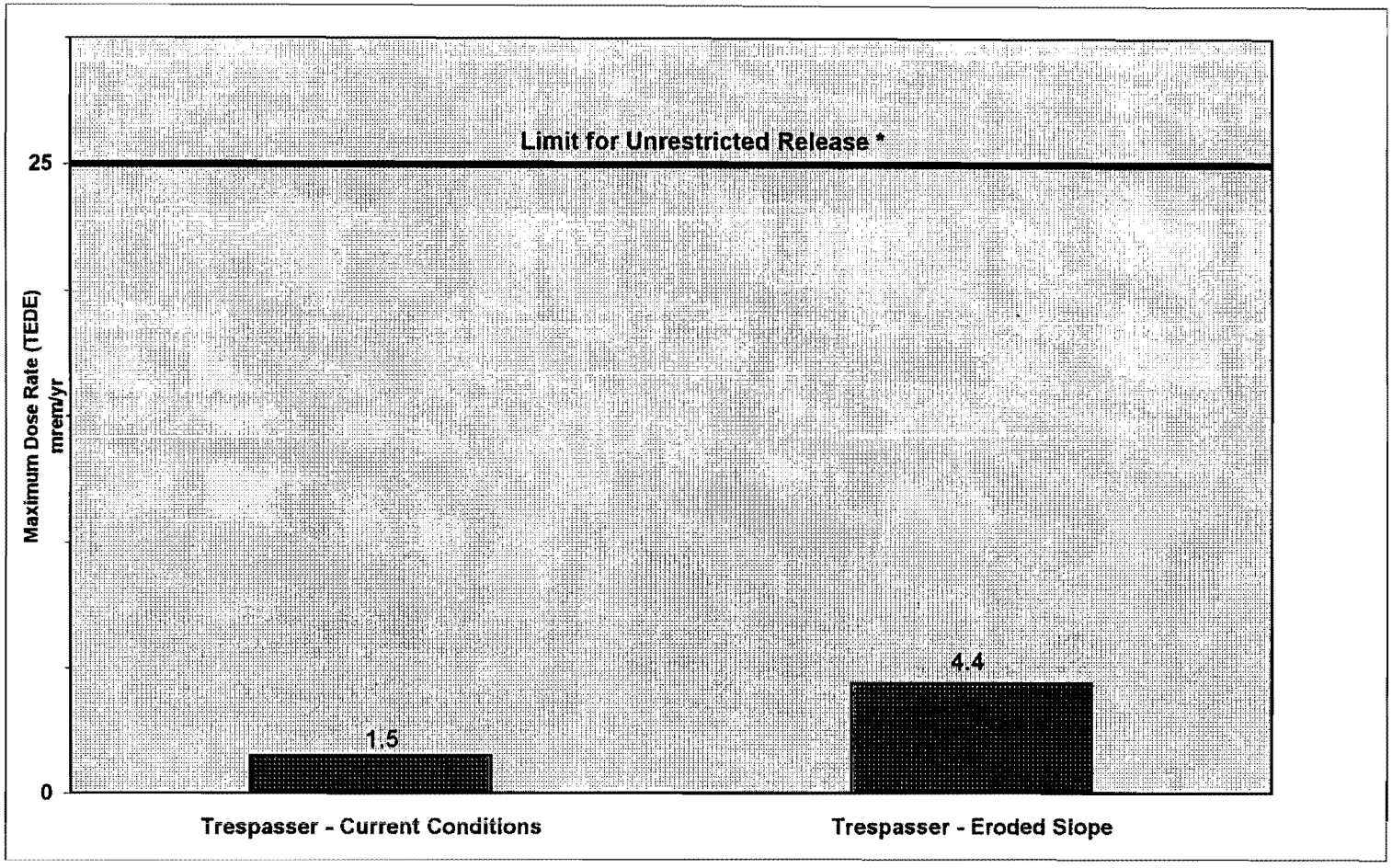
UNIT	MAXIMUM ANNUAL DOSE mrem/y					
	SLAG PILE AREA				ROW AREA	
	CASE TC Trespasser Current Conditions	CASE WC Worker Current Conditions	CASE TE Trespasser Eroded Conditions	CASE WE Worker Eroded Conditions	CASE RDRWWLK ROW Recreational Walker	CASE RDRWWRK ROW Worker
Slope--ground	1.376	0.383	4.128	1.148		
Slope--inhalation	0.061	0.017	0.183	0.051		
Slope--soil ingestion	0.026	0.007	0.077	0.021		
Top--ground		0.654		0.654		
Top--inhalation		0.076		0.076		
Top--soil ingestions		0.064		0.064		
ROW-Ground					0.305	0.722
ROW-Inhalation					0.012	0.980
ROW-Soil Ingestion					0.006	0.014
Total TEDE	1.5	1.2	4.4	2.0	0.32	1.7

Ground dose is deep dose equivalent, inhalation and soil ingestion doses are CEDE, total is TEDE.

The 10 CFR Part 20 dose criterion for license termination with no restrictions on use is 25 mrem/y TEDE.

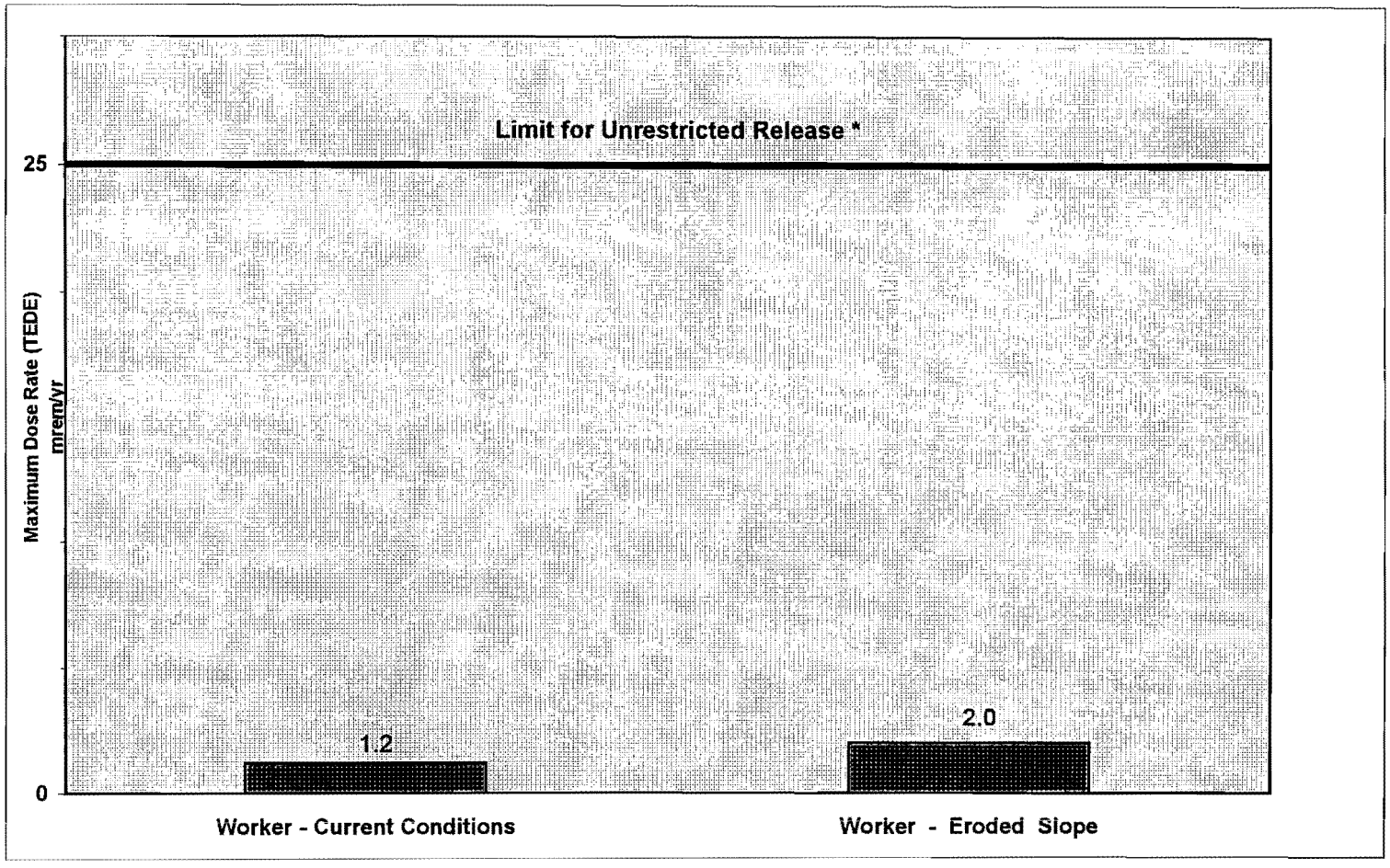
Case TC results from RESRAD run CBRDTC
Case WC results from RESRAD run CBRDWCS (slope) and CBRDWT (top)
Case TE results from RESRAD run CBRDTE
Case WE results from RESRAD run CBRDWES (slope) and CBRDWT (top)
Case RDRWWLK results from RESRAD run RDRWWLK
Case RDRWWRK results from RESRAD run RDRWWRK

FIGURE 5-1
MAXIMUM ANNUAL RADIATION DOSE (TEDE) RESULTS
SLAG PILE AREA TRESPASSER SCENARIO



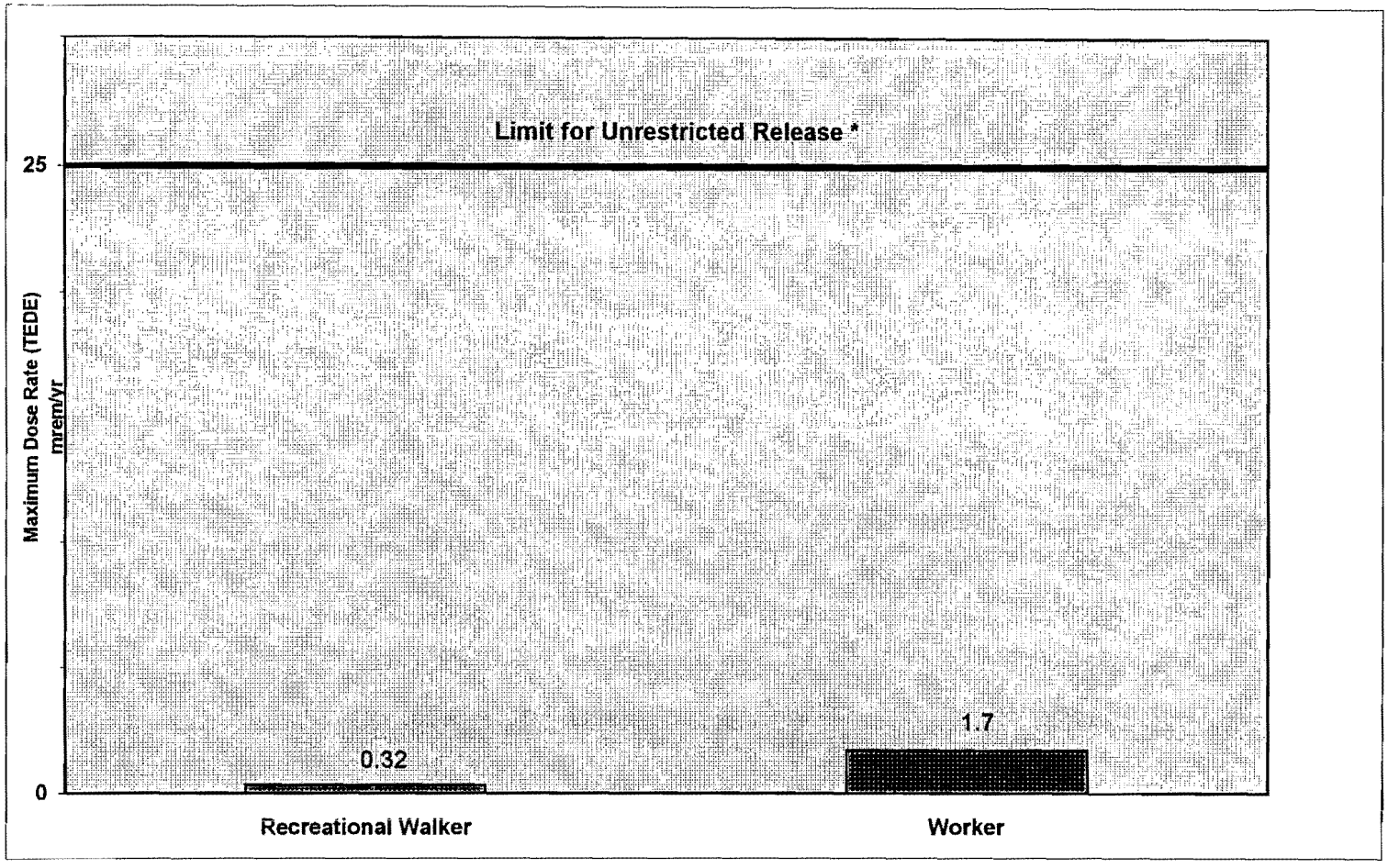
* Unrestricted Release = Less Than 25 mrem/year (10 CFR 20 Subpart E)

FIGURE 5-2
MAXIMUM ANNUAL RADIATION DOSE (TEDE) RESULTS
SLAG PILE AREA WORKER SCENARIO



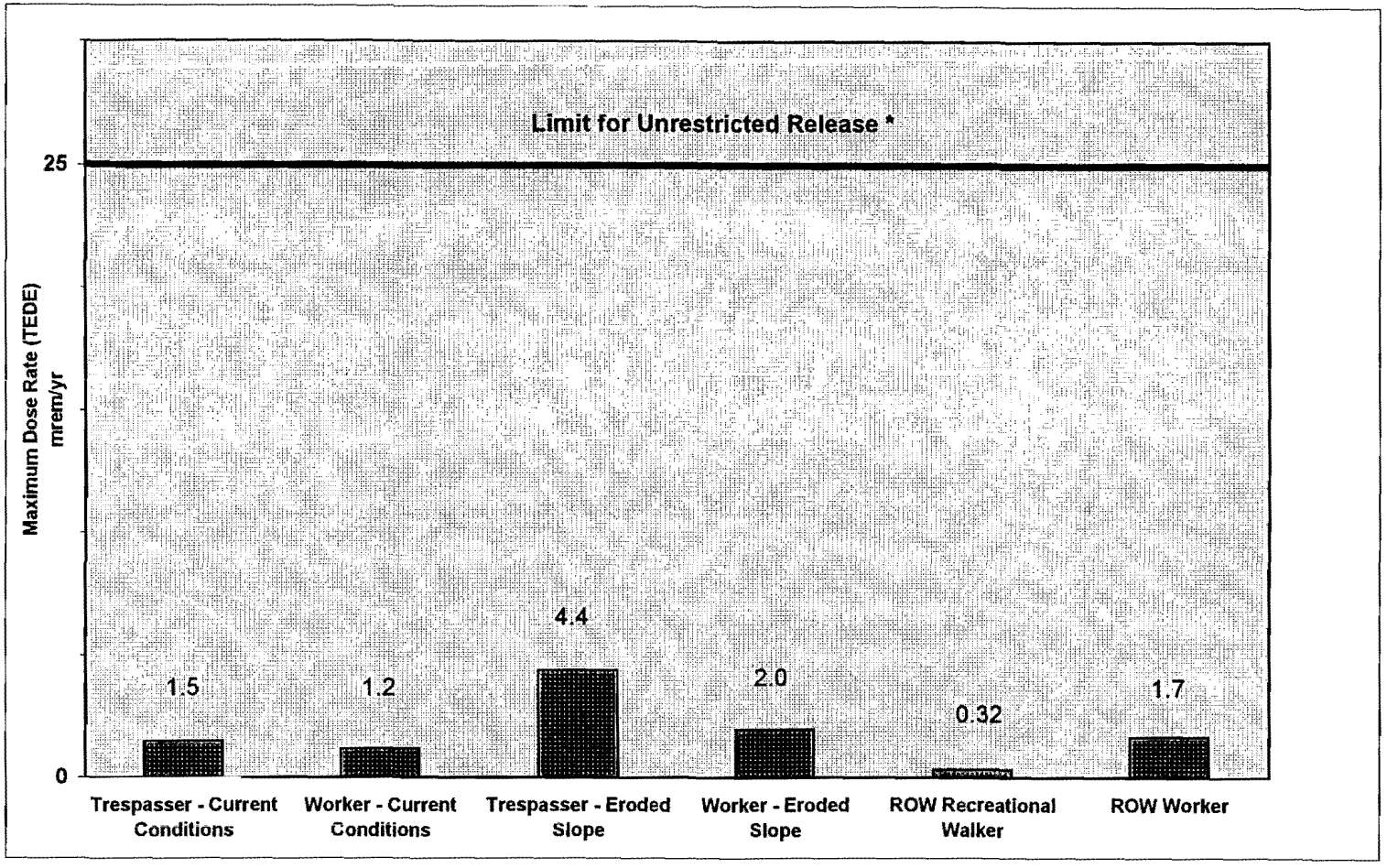
* Unrestricted Release = Less Than 25 mrem/year (10 CFR 20 Subpart E)

FIGURE 5-3
MAXIMUM ANNUAL RADIATION DOSE (TEDE) RESULTS
ROW AREA



* Unrestricted Release = Less Than 25 mrem/year (10 CFR 20 Subpart E)

FIGURE 5-4
MAXIMUM ANNUAL RADIATION DOSE (TEDE) RESULTS SUMMARY



* Unrestricted Release = Less Than 25 mrem/year (10 CFR 20 Subpart E)

6.0 ALARA ANALYSIS

The principle that radiation doses should be kept as low as reasonably achievable (ALARA) has been applied for many years in radiation protection. In conjunction with dose limits for workers and members of the public, application of the ALARA principal is an important element in the NRC standards for radiation protection (10 CFR Part 20). This section of the report describes an analysis designed to determine whether reduction of the concentration of uranium and thorium and progeny nuclides in soil on the Reading Site would be warranted by the ALARA principle. The methodology used in this analysis is generally consistent with current draft NRC guidance for ALARA assessment contained in Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for Decommissioning," issued March 13, 1998.

Elements of ALARA Analysis

In the context of soil remediation, ALARA analysis is fundamentally a balancing of the value of remedial action against its cost. If the expected value of the dose reduction exceeds the cost of remediation required to achieve the dose reduction, the action is warranted. The test is applied successively in a way that implements the most cost-effective actions first. When no further remedial actions are warranted by the ALARA test, remediation has reached the ALARA condition and the potential radiation dose has been reduced to a level as low as reasonably achievable.

Rigorous ALARA analysis can be complex, but ALARA analysis for situations such as the Reading soil remediation can be simplified greatly if the value of dose saved can be estimated on the conservatively high side and the cost of remediation can be estimated on the conservatively low side. If, in spite of such conservative assumptions, the cost of any proposed remediation exceeds the value of the dose expected to be saved, the ALARA condition has already been reached and no further dose reduction is warranted. If, on the other hand, the conservatively high estimated value of the dose expected to be saved exceeds the conservatively low estimate of the cost of any proposed remediation, the proposed action may be warranted. In that situation, a more rigorous analysis would be necessary to demonstrate that the ALARA point has been reached and no further dose reduction is warranted.

Value of Dose Saved

In determining the value of dose that might be saved by some candidate remedial action, the radiation dose quantity of interest is population dose, which can be thought of as an aggregate dose. It is the sum, over the future time period of interest and over the entire exposed population, of all of the individual annual doses received by each member of the exposed population. A population dose is expressed in units of person-rem. For example, ten people, each receiving 0.1 rem per year for a period of 20 years would result in a population dose of 20 person-rem.

The population dose depends upon the duration of the exposure period, the annual dose received by each person exposed, and the number of people exposed each year. Each of these factors is examined further below.

The maximum time period of interest is fixed by regulation at 1,000 years (10 CFR Part 20.1401). Shorter time periods can be considered more appropriate, and have been used in NRC environmental analyses, but for purposes of conservatism, shorter periods are not considered in this analysis. If a shorter period were to be used, the calculated aggregate dose would be less and the potential dose savings from any remedial action would be less than that calculated in this analysis.

The annual dose received by an exposed person can vary with time. However, the analysis can be simplified by conservatively assuming that the annual dose is constant with time at the maximum calculated in the 1,000-year period of interest. For purposes of this analysis the annual dose rate for a trespasser is assumed constant at 4.4 mrem/y for the entire exposure period. The corresponding annual dose rate for a worker is 2.6 mrem/y. These are the maximum calculated doses for the four scenarios identified in Section 3.0.

The total number of people exposed is highly site-dependent. For the Reading Site, it is unlikely that the Site will be used at all in a way that would result in doses even a small fraction of the limit for unrestricted release for reasons discussed in Section 3.0. For purposes of analysis, exposure of a small number of people can be assumed to assure that the benefits of further dose reduction are not understated. For this analysis, it is conservatively assumed that 5 trespassers and 5 workers are exposed each year.

The dose saved by a remedial action is the difference between two population doses--the population dose without the proposed remedial action less the population dose residual after implementation of the remedial action. The analysis can be simplified greatly if the population dose after remedial action is conservatively assumed to be zero (i.e., the remedial action is assumed to be entirely effective in eliminating the potential for radiation exposure). This assumption results in the maximum possible dose savings. Any more realistic estimate of potential dose savings from any remedial action can only be less, and, consequently, its value can only be less. With this simplification, it is possible to derive a conservatively high estimate of the expected dose to be saved from further remedial action by calculating only one population dose--the population dose based on the assumption that no further remedial action occurs.

The discussion of the benefit of remedial action has thus far focused on the dose saved. However, for ALARA analysis, the value of dose saved and the cost of remedial action must be expressed in the same units (monetary units). NRC has provided guidance for estimating the monetary value of population dose saved (USNRC, 1995b and USNRC, 1995c). These documents establish the value of a person-rem for purposes of ALARA

analysis at $2,000, and provide guidance for accommodating the differences in the time distributions of benefits realized from dose savings and costs incurred in remedial action.

In the context of this analysis, in which the value of dose saving is realized at a relatively low rate over a large portion of the time period of interest and the costs of remedial action are incurred entirely at the beginning of the time period, NRC guidance recommends consideration of the use of the present value of dose savings in the ALARA balance against remedial action costs. For periods of interest less than about 100 years, NRC recommends use of a 7% per year discount rate in valuing future dose savings. For longer periods, NRC recommends two approaches: (1) calculation of the value of dose savings on a present worth basis using a discount rate of 3% per year, and (2) displaying benefits and costs at the time they occur, with no present value conversion. For a time period of 1,000 years and a constant annual dose, the first approach is equivalent to using an undiscounted value of a person-rem of approximately $70. For the conservative assumption, noted above, of a constant annual dose with time, the realization of the value of dose savings can be considered to occur at a rate constant with time.

The above discussion leads to a simple algorithm for deriving a conservatively high estimate of the value of dose savings from reducing the concentration of radionuclides in soil. The value estimate in present value dollars is the product of the number of people exposed each year, the annual dose to each (expressed in rem), the time period of interest (1,000 years), and the monetary value of a person-rem ($70, as described above).

Cost of Remedial Action

The second part of the ALARA analysis usually involves identification of candidate remedial actions and estimation of costs for each. In this more simple case, detailed cost estimates for candidate remedial actions are not necessary, because, as shown below, the dose to be saved is so low at the outset that its value is not sufficient to warrant any remedial action.

ALARA Analysis and Conclusions

ALARA analyses performed as described above can be summarized in the equations below:

$$B = N \times D \times T \times V / (1000) \qquad \text{Equation 1}$$

Where

B is the benefit of dose saved in terms of dollars per square meter remediated,

N is the number of people exposed each year, 5 trespassers and 5 workers, as noted above,

D is the constant annual dose, 4.4 mrem/y (TEDE) per trespasser and 2.0 mrem/y (TEDE) per worker,

T is the aggregation time, 1,000 years,

V is the value of 1 person-rem dose savings, $70, as described above,
1000 is the number of mrem per rem.

The use of Equation 1 to calculate the maximum potential benefit of any candidate remedial action results in a benefit value of $2,200. Detailed cost analysis is not required to conclude that no remedial action could result in a significant dose reduction for a cost as little as $2,200. Therefore, remedial action for further reduction is not warranted by the ALARA principle.

7.0 RADIOLOGICAL ASSESSMENT CONCLUSIONS

Detailed results of the radiological assessment are provided and discussed in Section 5.0. In summary, results from the analysis show that the maximum radiation dose that might be expected from unrestricted use of the Site is far below the 10 CFR Part 20 limit of 25 mrem/year (TEDE) for release with unrestricted use. Specifically, the maximum dose (TEDE) calculated for the Slag Pile Area trespasser under current conditions is 1.5 mrem/y. Under eroded slope conditions, the trespasser would receive a maximum dose (TEDE) of 4.4 mrem/y. A worker spending 10% of his work time in the Slag Pile Area under current conditions would receive a maximum dose (TEDE) of 1.2 mrem/y. The maximum dose (TEDE) calculated for the worker with eroded slope conditions is 2.0 mrem/y. A recreational walker in the ROW Area would receive a maximum dose (TEDE) of 0.32 mrem/y. A worker in the ROW Area would receive a maximum dose (TEDE) of 1.7 mrem/y. Those results are summarized below:

CASE	MAXIMUM ANNUAL TOTAL DOSE (mrem/y TEDE)
Slag Pile Area; Trespasser—current conditions	1.5
Slag Pile Area; Trespasser—eroded slope	4.4
Slag Pile; Worker—current conditions	1.2
Slag Pile; Worker—eroded slope	2.0
ROW Area; Recreational Walker	0.32
ROW Area; Worker	1.7
The 10 CFR Part 20 dose criterion for license termination with no restrictions on use is 25 mrem/y.	

The maximum dose (TEDE) calculated for all scenarios is 4.4 mrem/y, substantially less than the 10 CFR Part 20 limit of 25 mrem/y.

Bounding case trespasser and worker scenario analyses are described in Appendix B. The maximum doses calculated for these scenarios were identical, 13 mrem/y. This bounding dose estimate is also below the 10 CFR Part 20 limit of 25 mrem/y.

The ALARA analysis in Section 6.0 shows that no remedial action is warranted by the ALARA principle to reduce doses further. Because the maximum calculated annual doses (TEDE) are below the limit for release with unrestricted use, and the ALARA analysis shows that no remedial action is warranted, the Site qualifies for license termination with no restrictions on use.

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APPENDIX A

LEACH TEST RESULTS

PROJECT NUMBER 1295073V L202 PROJECT NAME NES
FIELD GROUP RNESB2 LAB COORDINATOR JEFF SHAMIS

FLD.GRP.	#*	SAMPLE ID**	DATE	URANIUM U UG/G AS RECEIVED	THORIUM DECAY PRODUCTS AC-228 PCI/G DRIED	BI-212 PCI/G DRIED	PB-212 PCI/G DRIED	TL-208 PCI/G DRIED
RDSLAG1								
RNESB2	1	RDSLAG1	11/07/95	676	316 +/- 2.43	2.17 +/- 0.153	297 +/- 1.58	105 +/- 0.976
RNESB2	11	RDS-OXSU4	11/07/95	6.90	NRQ	NRQ	NRQ	NRQ
RNESB2	21	RDS-OXSU6	11/07/95	1.68	NRQ	NRQ	NRQ	NRQ
RNESB2	31	RDS-OXSUT	11/07/95	8.93	NRQ	NRQ	NRQ	NRQ
RNESB2	41	RDS-RAU	11/07/95	1.81	NRQ	NRQ	NRQ	NRQ
RNESB2	51	RDS-SAU	11/07/95	0.201	NRQ	NRQ	NRQ	NRQ
RNESB2	61	RDS-TAU	11/07/95	85.8	NRQ	NRQ	NRQ	NRQ
RVSLAG1								
RNESB2	2	RVSLAG1	11/07/95	220	10.8 +/- 0.666	6.62 +/- 1.31	9.61 +/- 0.390	3.82 +/- 0.237
RNESB2	12	RVS-OXSU4	11/07/95	0.031	NRQ	NRQ	NRQ	NRQ
RNESB2	22	RVS-OXSU6	11/07/95	0.052	NRQ	NRQ	NRQ	NRQ
RNESB2	32	RVS-OXSUT	11/07/95	0.081	NRQ	NRQ	NRQ	NRQ
RNESB2	42	RVS-RAU	11/07/95	0.128	NRQ	NRQ	NRQ	NRQ
RNESB2	52	RVS-SAU	11/07/95	0.034	NRQ	NRQ	NRQ	NRQ
RNESB2	62	RVS-TAU	11/07/95	0.824	NRQ	NRQ	NRQ	NRQ
RSP#41								
RNESB2	3	RSP#41	11/07/95	49.6	37.5 +/- 0.964	<0.276 +/- 0.061	39.3 +/- 0.699	12.8 +/- 0.413
RNESB2	43	RSP-RAU	11/07/95	0.186	NRQ	NRQ	NRQ	NRQ
RNESB2	53	RSP-SAU	11/07/95	0.826	NRQ	NRQ	NRQ	NRQ
RNESB2	63	RSP-TAU	11/07/95	8.13	NRQ	NRQ	NRQ	NRQ

*ESE Samples 1-3 received from NES.
Others numbers setup in-house to document results of RAU/SAU/TAU and oxidation-state determinations.
**IDs of OXSUi = Oxidation State of Uranium where i = 4, 6, or Total.

APPENDIX B

SENSITIVITY SCENARIOS

1.0 Introduction

As noted in Section 3.0 of the Radiological Assessment main report, assessment of potential future exposure must include development of reasonably expected scenarios by which exposure might occur. The description of the primary analysis of these scenarios is in the main report. This appendix describes analyses performed to assess sensitivity of results to scenario assumptions.

Sensitivity analyses were conducted to test the robustness of conclusions based on the primary analysis. Several approaches are useful in sensitivity analysis. In one approach, the exposure scenarios developed for the primary analysis are reevaluated using unrealistically conservative values for important input parameters—e.g., unreasonably long exposure durations. In a second approach, exposure scenarios that may be entirely implausible for site conditions, but which otherwise could result in greater potential for exposure than more plausible scenarios, are evaluated on a hypothetical basis. If the results of the sensitivity analyses also support the conclusions drawn from the primary analysis, assurance of the soundness of those conclusions is increased.

2.0 Sensitivity Exposure Scenarios

Both types of sensitivity analysis were included in this assessment. The first type, Variations on Expected Use scenarios, examines the effect of parameter value variation on the results obtained in the primary analysis described in the main report by using extremely conservative values for key parameters. The second type, is a single scenario—the resident gardener scenario. This scenario is considered too unlikely for evaluation in the primary analysis, but evaluation as a sensitivity case permits examination of the scenario on a hypothetical basis. The second type of sensitivity analysis was included in the assessment at the request of NRC (USNRC, 1999c). The definition of exposure scenarios for these two types of sensitivity classes is described below.

Variations on Expected Use Scenarios

Development of sensitivity scenarios recognizes that the Slag Pile Area is not likely to be used for any particular purpose. Residential use would be impractical. Some kind of occasional recreational or occupational use may be feasible, but even in those scenarios, exposure time would be small. The areas containing radioactive materials do not lend themselves very well to either recreational or occupational uses. The slope is too steep and the flat portion is too small and too close to the edge of the embankment. The only potential exposure pathways would be those that might involve some walking over the

areas. Thus, variations of the trespasser and worker scenarios defined and analyzed in the main report are most appropriate for the sensitivity analysis.

The trespasser walks occasionally on the Site. The worker works in a building on the Site and occasionally walks on the Site. For the sensitivity scenarios, it is assumed that the trespasser and worker are exposed to subsurface soils while walking on the slope. These soils contain higher nuclide concentrations than soils near the surface currently, which would tend to increase the calculated dose. This assumption implicitly incorporates the unrealistic assumption that substantial erosion occurs within a short time after release for unrestricted use.

For purposes of sensitivity analysis, two scenarios were developed that are identical to two of the base case scenarios except that longer occupation times are assumed. Sensitivity scenario BT (bounding trespasser) is identical to base case scenario TF (trespasser future) except that the occupation time on the slope is increased from 3 hours per week for 6 months of the year to 5 hours per week for 9 months of the year. This would constitute very intense use of the Site.

The second sensitivity scenario BW (bounding worker) is identical to base case scenario WF (worker future) except that the fraction of the worker's work hours on the Site is increased to 50 percent rather than 10 percent. It is assumed that he would spend 900 hours per year in a building on the top of the slope and 100 hours per year on the slope. Given the limited area for a work location on top of the slope and the limited use of the slope, this scenario also would constitute very intense use of the Site. The key assumptions for each of the sensitivity scenarios developed for the Reading Site are summarized in the attached Table B-1. Except for occupation times, the assumptions and parameter values used for the sensitivity scenarios are the same as the values used for the corresponding base case scenario defined in Section 3.0 of the Radiological Assessment main report.

Resident Gardener Scenario

An exposure scenario in which people live on and garden on the land bearing radionuclides (resident gardener scenario) is often used in screening evaluation of sites. For reasons described in the main report, such a scenario is highly unlikely for the Reading Site, and, for that reason, was not included in the primary analysis. The scenario remains of interest, however, at least as a hypothetical case, and has been included as a sensitivity analysis.

The likelihood and form of a resident gardener exposure scenario would be strongly influenced by key features of the Site and the materials bearing radioactive material:

- The Site containing radionuclides is a small portion of a property that is likely to remain industrial. The Site is a small area (approximately 100' x 150') on the southwest side of the industrial property.

- The Site will likely remain isolated from residential properties that partially bound the larger industrial property. The Site is physically isolated on an embankment except for strip less than 15 feet wide along top. The embankment slope is stable, but too steep for residences, gardens, other typical land uses. Slag would most likely be diluted and covered in any attempt to make the area useful for these purposes, but the potential for regrading is low because there is no place on the industrial property to put excess material and institutional ownership of the immediately adjacent property would preclude the use of that property for relocation of any excess material from grading. The current topography of the industrial property is optimal for development and unlikely to change in the future.

- Radioactive material is bound in slag particles of various sizes mixed with other non-radiological slag, debris, and some soil. The material is not suitable for gardening. The strong binding of radionuclides within slag particles limits concentration of radionuclides in groundwater to very low levels, and would minimize the potential for uptake from slag particles into roots of vegetation.

- The area would not be a suitable source for groundwater. Alternate sources (municipal water and the river) are readily available. In any event, the concentrations of radionuclides in leachate from slag are so low that, even if groundwater could be used, the radiation dose would be negligibly small.

- The average net radionuclide concentration in near-surface (top 2 feet) materials is about 25 pCi/g total uranium and thorium, about 7.5 pCi/g thorium-232 and 5 pCi/g uranium-238 with progeny in equilibrium. The average through the entire depth (considered representative for assessment of potential eroded state) is about 3 times higher in same proportions. The depth of elevated radionuclide concentrations in the pile material is variable, but 6 feet is a reasonable average for dose assessment purposes.

Exposure Pathway and Scenario Definition

Based on consideration of the Site and material characteristics, a hypothetical resident gardener scenario for the Reading Site can be summarized as the occupants of a residence near, but not on the radionuclide-bearing material with a vegetable garden located entirely in radionuclide-bearing material. It is helpful for purposes of analysis to consider potential exposure from residence activities and from gardening activities separately.

Potential exposure pathways warranting analysis for residence activities, which would include outdoor activities (other than gardening) at the residence would include:

1. Ground - Direct radiation from material in soil

2. Dust - Resuspension of surface particulate material (air inhalation)

3. Soil - Ingestion of soil

Potential exposure pathways warranting analysis for gardening would include:

1. Ground - Direct radiation from material in soil

2. Dust - Resuspension of surface particulate material (air inhalation)

3. Soil - Ingestion of soil

4. Plant - Ingestion of vegetables grown in garden

The key assumptions important to dose and basis for them are provided below. In the development of these assumptions, Site-specific considerations were applied where they appeared to be important. Conservative assumptions typically used in screening analyses were used elsewhere. The key assumptions and their basis are:

- Residence occupants do not use groundwater for any purpose for reasons described above.

- Residence occupants live in a house on a lot that backs on the slag pile. Because of stability considerations, the house is placed toward the front of the lot and away from the slag pile material. The lot is at least 100 feet from front to back, consistent with existing residential lots in the residential area nearest the slag pile (STEP, 1999a).

- Residence occupants maintain a 40-m^2 (~430ft^2) vegetable garden, large by urban standards, particularly given the limited lot size likely.

- The residence occupants (assumed to number two) together consume the entire garden product, determined by the area of the garden and the mass yields of leafy vegetables (lettuce, spinach, etc.) and other vegetables (tomatoes, beans, carrots, squash, etc.), respectively, and a mass production ratio of 1/5 leafy to other vegetables, consistent with typical consumption rates (Beyeler, 1998b, Table 3.9.1). The derivation of the garden yield is shown in Table B-2. As shown in Table B-2, the annual garden yield is 5.5 kg/y of leafy vegetables and 25.4 kg/y of other vegetables, or a total of 30.9 kg/y total. Of this, each occupant is assumed

to ingest half, or 15.5 kg/y.

- The garden may either be along the back of the lot (i.e., in the slag/soil material on the top of the pile) or in slag/soil material on the slope, either in its current state, or in its potential eroded state. Because radionuclide concentrations in subsurface materials are about three times higher than in surface materials or materials at the top of the slope, doses from gardening would be highest for a garden in the potential eroded state, and would be roughly a factor of three lower for gardening on the slope in the current state or for gardening on the top of the slope. For purposes of this analysis, gardening was conservatively assumed to occur on the slope in the eroded state. Because the slag is not suitable as a growing medium, this is considered an extremely conservative assumption.

- Each residence occupant is assumed to spend 70 h/y (about 0.008 of his time) gardening. In this activity, he is exposed to direct gamma radiation, dust suspended at a concentration of 4E-4 g/m^3, and soil ingested at a rate of 36.5 g/y. These parameter values are reasonably conservative estimates (Beyeler, 1998b).

- Each resident is also assumed to spend 963 h/y (about 0.11 of his time) in non-gardening outdoor activities on his land. The portion of this time spent on slag material is assumed to be the fraction of the slag-bearing land on his lot to his total lot size. Because the slag material extends about 15 feet from the edge of the bank, this portion would be the ratio of 15 feet to the minimum depth of the lot in feet, 100 feet, as specified above. In this activity, each resident is exposed while on the slag material to direct gamma radiation, dust suspended at a concentration of 3.1E-6 g/m^3, and soil ingested at a rate of 36.5 g/y. These parameter values are reasonably conservative estimates (Beyeler, 1998b).

- Central estimate values for factors for uptake from soil to plants were used for thorium, uranium, radium, and lead—the major chemical elements represented by radionuclides at the Reading Site (Beyeler, 1998b). Given the limited solubility of radionuclides in slag, even the use of central estimate values for the plant-to-soil uptake factor is likely to be highly conservative for the Reading Site. Because the RESRAD code evaluates only one "average" type of plant in the calculation of uptake from soil to roots, the values for leafy and other vegetables from Beyeler were combined in a production-weighted average form for input to RESRAD. The derivation of values used in the analysis is shown in Table B-3.

The key assumptions for the Resident Gardener scenario are summarized in the Table B-4.

3.0 Dose Assessment Methodology

The methodology used for the Variations on Expected Use sensitivity scenarios was the same as that used for the primary analysis scenarios, as described in Section 4.0 of the main Radiological Assessment report. The methodology for the Resident Gardener scenario also the same as methodology used for the primary analysis scenarios, except that the analysis for the Resident Gardener scenario was performed by combining the results of two RESRAD runs—one representing the gardening exposure and one representing the resident exposure.

The feature of RESRAD that allows for dilution of resuspended dust by dust transported from off-Site was not used for the resident gardener scenario but was used for the other scenarios. This feature was judged to be applicable in scenarios where resuspended dust levels were near typical ambient levels (i.e., the trespasser and worker scenarios). The feature was considered inapplicable for scenarios in which dust levels were assumed to derive primarily from a small, localized source (i.e., gardening activities in the resident gardener scenario). This approach is considered to yield reasonably conservative estimates of dose for all scenarios.

4.0 Results and Conclusions

Complete listings of the summary output data file for a RESRAD run representative of each scenario analyzed are provided along with the output in Appendix D. Each output data file also lists the input data used.

The sensitivity scenario total dose (TEDE) results are provided in Table B-5 and B-6 for the Variations on Expected Uses and Resident Gardener scenarios, respectively. These tables correspond to Table 5-1 in the main report, which provides primary analysis results. Some intermediate results are included to make the process more visible.

A maximum dose of 11 mrem/y was calculated for both the trespasser and worker sensitivity scenarios in the Variations on Expected Uses scenarios.

The maximum dose calculated for the resident gardener scenario was 16 mrem/y. The largest single contributor to this dose is ingestion of plants grown in the garden, 6.7 mrem/y. Direct radiation dose from materials in the soil (ground dose) is nearly as large, 6.4 mrem/y. Almost all of the remainder results from inhalation.

The results of the sensitivity analysis show that even with unrealistic conservative assumptions, the maximum calculated radiation dose from residual radioactive material at the Reading Site, 15.9 mrem/year, would be well below the 25 mrem/y (TEDE) level established in 10 CFR Part 20, Subpart E for license termination without restrictions on use.

TABLE B-1
SENSITIVITY SCENARIO PATHWAYS AND KEY PARAMETER VALUES
VARIATIONS ON EXPECTED USE SCENARIOS

	SCENARIO	
PATHWAY ASSUMPTIONS	BT Trespasser--future conditions--bounding analysis	BW Worker--future conditions--bounding analysis
General Description	Trespasser walks on slope in eroded condition 5 h/wk, 9 mo/y	Worker works on radiological area 50% of his work time, 1000 h/y, of which 100 h/y is walking on slope in eroded condition, 900 h/y is in building with 6" concrete floor on top of pile.
Water-independent pathways		
External	Yes	Yes
Indoor exposure time (h/y)	NA	900 (top)
Structural shielding factor	NA	0.19
Outdoor exposure time (h/y)	180 (slope)	100 (slope)
Inhalation (dust)	Yes	Yes
Indoor exposure time (h/y)	NA	900 (top)
Structural shielding factor	NA	0.5
Outdoor exposure time (h/y)	180 (slope)	100 (slope)
Inhalation rate (m3/y)	1.22E+04	1.22E+04
Mass loading (g/m3)	2.00E-04	2.00E-04
Inhalation (radon)	NA	NA
Ingestion of vegetables	NA	NA
Ingestion of meat	NA	NA
Ingestion of milk	NA	NA
Ingestion of soil	Yes	Yes
Outdoor exposure time (h/y)	180 (slope)	100 (slope)
Soil ingestion rate (g/y)	36.5	36.5
Water-dependent pathways		
Ingestion of water	NA	NA
Ingestion of aquatic food	NA	NA
Ingestion of vegetables (irrigated)	NA	NA
Ingestion of meat (irrigated)	NA	NA
Ingestion of milk (irrigated)	NA	NA
Inhalation (radon from water)	NA	NA

TABLE B-2
READING SLAG PILE SITE
GARDEN PRODUCTION CALCULATION

INPUT:

SANDIA default vegetable consumption rates (Table 3.9.1, Beyerly, 1998)

11 TCRL, Total consumption rate of leafy vegetables, kg/y

51 TCRO, Total consumption rate of other vegetables, kg/y

RESRAD garden vegetable yields

1.5 YL, Yield of leafy vegetables, kg/m2-y

0.7 YO, Yield of other vegetables, kg/m2-y

ASSUMED GARDEN AREA

40 AG, Area of garden, m2 430.5564 ft2

OUTPUT:

36.34 AO, Area of garden for other vegetables, m2 = AG/((YO/YL*TCRL/TCRO)+1)

3.66 AL, Area of garden for leafy vegetables, m2 = AG-AO

25.4 PRO, Production rate of other vegetables from garden, kg/y = AO*YO

5.49 PRL, Production rate of leafy vegetables from garden, kg/y = AL*YL

DERIVATION OF EXPRESSION FOR AO:

Given:

AL + AO = AG (1)

AL*YL = PRL (2)

AO*YO = PRO (3)

Assume proportion of leafy to other veg for portion from garden is same proportion as in total consumption:

PRL/PRO = TCRL/TCRO (4)

Rearrange (4):

PRL = TCRL/TCRO*PRO (5)

Substitute (5) into (2) and rearrange:

AL*YL*TCRO/TCRL = PRO (6)

Substitute (6) into *3):

AO*YO = AL*YL*TCRO/TCRL (7)

Rearrange (1):

AL = AG - AO (8)

Substitute (8) into (7):

AO*YO = (AG - AO)*YL*TCRO/TCRL (9)

Rearranging (9):

(AG - AO)/AO = YO/YL*TCRL/TCRO

(AG/AO - 1) = YO/YL*TCRL/TCRO

AG/AO = YO/YL*TCRL/TCRO + 1

AO = AG/((YO/YL*TCRL/TCRO) + 1) (10)

TABLE B-3
CALCULATION OF REVISED RESRAD PLANT-TO-SOIL UPTAKE FACTORS

ELEMENT	RESRAD DEFAULT	NUREG/CR-5512 DEFAULT, DRY BASIS		NUREG/CR-5512 DEFAULT, WET BASIS		NUREG/CR-5512 REVISED, DRY BASIS, GEO MEAN		NUREG/CR-5512 REVISED, WET BASIS, GEO MEAN		RESRAD REVISED
	(pCi/g wet veg per pCi/g dry soil) All types	(pCi/g dry veg per pCi/g dry soil) Leafy	(pCi/g dry veg per pCi/g dry soil) Other	(pCi/g wet veg per pCi/g dry soil) Leafy	(pCi/g wet veg per pCi/g dry soil) Other	(pCi/g dry veg per pCi/g dry soil) Leafy	(pCi/g dry veg per pCi/g dry soil) Other	(pCi/g wet veg per pCi/g dry soil) Leafy	(pCi/g wet veg per pCi/g dry soil) Other	(pCi/g wet veg per pCi/g dry soil) All types
Pb	*1.00E-02*	5.80E-03	3.20E-03	*1.16E-03*	*8.00E-04*	4.50E-02	9.00E-03	*9.00E-03*	*2.25E-03*	*3.45E-03*
Ra	*4.00E-02*	7.50E-02	3.20E-03	*1.50E-02*	*8.00E-04*	1.50E-02	1.50E-03	*3.00E-03*	*3.75E-04*	*8.42E-04*
Th	*1.00E-03*	6.60E-03	1.20E-04	*1.32E-03*	*3.00E-05*	8.50E-04	8.50E-05	*1.70E-04*	*2.13E-05*	*4.77E-05*
U	*2.50E-03*	1.70E-02	1.40E-02	*3.40E-03*	*3.50E-03*	8.50E-03	4.00E-03	*1.70E-03*	*1.00E-03*	*1.12E-03*

Values in italics are all expressed in wet basis terms; other values are in dry basis terms.

NUREG/CR-5512 default, dry basis values are from Beyeler, 1998, Table 5.7-1.

Derived wet basis values are based on dry/wet weight ratios of 0.2 for leafy vegetables and 0.25 for other vegetables, values from Beyeler, 1998, Table 5.9.1.1.

NUREG/CR-5512 revised, dry basis values are from Beyeler, 1998, Table 5.7-2.

RESRAD revised value is a production-weighted average of NUREG/CR-5512 revised, wet basis, geo mean values, with the weighting based on production of 5.5 kg/y leafy vegetables and 25.4 kg/y other vegetables (see text).

TABLE B-4
SENSITIVITY SCENARIO PATHWAYS AND KEY PARAMETER VALUES
RESIDENT GARDENER SCENARIO

	SCENARIO	
	RESIDENT GARDENER	
PATHWAY ASSUMPTIONS	Gardening	Residence
General Description	Works in garden 70 h/y and consumes half of produce	Outdoor activities on slag at rear of lot
Water-independent pathways		
External	Yes	Yes
Indoor exposure time (h/y)	NA	NA
Structural shielding factor	NA	NA
Outdoor exposure time (h/y)	70	145
Inhalation (dust)	Yes	Yes
Indoor exposure time (h/y)	NA	NA
Structural shielding factor	NA	NA
Outdoor exposure time (h/y)	70	145
Inhalation rate (m3/y)	1.49E+04	1.22E+04
Mass loading (g/m3)	4.00E-04	3.10E-06
Inhalation (radon)	NA	NA
Ingestion of vegetables	Yes	Yes
Leafy plant consumption (kg/y)	2.75	NA
Leafy plant consumption (kg/y)	12.7	NA
Ingestion of meat	NA	NA
Ingestion of milk	NA	NA
Ingestion of soil	Yes	Yes
Outdoor exposure time (h/y)	70	145
Soil ingestion rate (g/y)	36.5	36.5
Water-dependent pathways	NA	NA

TABLE B-5
RESULTS SUMMARY
VARIATIONS ON EXPECTED USES SCENARIOS

UNIT	MAXIMUM ANNUAL DOSE mrem/y	
	CASE BT Trespasser--future conditions--bounding analysis	CASE BW Worker--future conditions--bounding analysis
Slope--ground	1.0E+01	5.7E+00
Slope--inhalation	4.6E-01	2.5E-01
Slope--soil ingestion	1.9E-01	1.1E-01
Top--ground		3.3E+00
Top--inhalation		3.8E-01
Top--soil ingestions		3.2E-01
Total TEDE	10.7	10.1

Ground dose is deep dose equivalent, inhalation and soil ingestion doses are CEDE, total is TEDE.

The 10 CFR Part 20 dose criterion for license termination with no restrictions on use is 25 mrem/y TEDE.

Case BT results from RESRAD run CBRDBT
Case BW results from RESRAD run CBRDBWS (slope) and CBRDBWT (top)

TABLE B-6
RESULTS SUMMARY
RESIDENT GARDENER SCENARIO

PATHWAY	MAXIMUM ANNUAL DOSE mrem/y	
	Gardening	Resident
Ground	3.8E+00	2.6E+00
Inhalation	2.6E+00	1.1E-02
Soil ingestion	7.5E-02	5.2E-02
Plant ingestion	6.7E+00	NA
Subtotal TEDE	1.3E+01	2.7E+00
Total TEDE	15.9	

Ground dose is deep dose equivalent, inhalation and soil ingestion doses are CEDE, total is TEDE.

Resident dose is dose from outdoor activities (excluding gardening) at residence.

Total TEDE is sum of doses from gardening and other outdoor activities.

Gardening results from RESRAD run Rdg-gardener
Resident results from RESRAD run Rdg-resident

The 10 CFR Part 20 dose criterion for license termination with no restrictions on use is 25 mrem/y TEDE.

APPENDIX C

MICROSHIELD Input and Output

CASE: CRD1 5m x 50m no shield

BUILDUP FACTOR: based on TAYLOR method.
Using the characteristics of the materials in shield 1.

INTEGRATION PARAMETERS:

Number of lateral angle segments (Ntheta)..... 51
Number of azimuthal angle segments (Npsi)..... 21
Number of radial segments (Nradius)..... 41

SOURCE NUCLIDES:

Nuclide	Curies	Nuclide	Curies	Nuclide	Curies
Ac-228	9.0000e-03	Bi-210	6.0000e-03	Bi-212	9.0000e-03
Bi-214	6.0000e-03	Pa-234	7.8000e-06	Pa-234m	6.0000e-03
Pb-210	6.0000e-03	Pb-212	9.0000e-03	Pb-214	6.0000e-03
Po-210	6.0000e-03	Po-212	5.7600e-03	Po-214	6.0000e-03
Po-216	9.0000e-03	Po-218	6.0000e-03	Ra-224	9.0000e-03
Ra-226	6.0000e-03	Ra-228	9.0000e-03	Rn-220	9.0000e-03
Rn-222	6.0000e-03	Th-228	9.0000e-03	Th-230	6.0000e-03
Th-232	9.0000e-03	Th-234	6.0000e-03	Tl-208	3.2400e-03
Tl-210	1.2600e-05	U-234	6.0000e-03	U-238	6.0000e-03

CASE: CRD1 5m x 50m no shield

RESULTS:

Group £	Energy (MeV)	Activity (photons/sec)	Dose point flux MeV/(sq cm)/sec	Dose rate (mr/hr)
1	2.5667	1.380e+08	5.011e+00	7.550e-03
2	1.6228	1.253e+08	2.559e+00	4.421e-03
3	1.1519	7.618e+07	1.008e+00	1.884e-03
4	.8769	3.199e+08	3.069e+00	6.075e-03
5	.5949	2.173e+08	1.441e+00	2.978e-03
6	.4752	5.865e+07	3.041e-01	6.204e-04
7	.3231	2.135e+08	6.316e-01	1.284e-03
8	.2393	1.996e+08	3.806e-01	7.364e-04
9	.1691	1.200e+07	1.391e-02	2.465e-05
10	.1210	1.793e+07	1.229e-02	1.962e-05
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
	TOTALS:	1.378e+09	1.443e+01	2.559e-02

Microshield 3.11

(HENRY MORTON - £098)

Page : 1
File : CRD2.MSH
Run date: August 18, 1998
Run time: 2:48 p.m.

File Ref: STP Cbt
Date: 8/18/98
By: [illegible]
Checked:

CASE: CRD2 5m x 5m no shield

GEOMETRY 11: Rectangular solid source - slab shields

Distance to detector.....	X	400.	cm.
Source width.....	W	500.	"
Source length.....	L	500.	"
Rectangular solid, thickness toward dose pt..	T1	300.	"
Thickness of second shield.....	T2	100.	"

Source Volume: 75000000 cubic centimeters

MATERIAL DENSITIES (g/cc):

Material	Source	Shield 2
Air		.001220
Aluminum		
Carbon		
Concrete	1.60	
Hydrogen		
Iron		
Lead		
Lithium		
Nickel		
Tin		
Titanium		
Tungsten		
Urania		
Uranium		
Water		
Zirconium		

CASE: CRD2 5m x 5m no shield

BUILDUP FACTOR: based on TAYLOR method.
Using the characteristics of the materials in shield 1.

INTEGRATION PARAMETERS:

Number of lateral angle segments (Ntheta)..... 41
Number of azimuthal angle segments (Npsi)..... 41
Number of radial segments (Nradius)..... 41

SOURCE NUCLIDES:

Nuclide	Curies	Nuclide	Curies	Nuclide	Curies
Ac-228	9.0000e-04	Bi-210	6.0000e-04	Bi-212	9.0000e-04
Bi-214	6.0000e-04	Pa-234	7.8000e-07	Pa-234m	6.0000e-04
Pb-210	6.0000e-04	Pb-212	9.0000e-04	Pb-214	6.0000e-04
Po-210	6.0000e-04	Po-212	5.7600e-04	Po-214	6.0000e-04
Po-216	9.0000e-04	Po-218	6.0000e-04	Ra-224	9.0000e-04
Ra-226	6.0000e-04	Ra-228	9.0000e-04	Rn-220	9.0000e-04
Rn-222	6.0000e-04	Th-228	9.0000e-04	Th-230	6.0000e-04
Th-232	9.0000e-04	Th-234	6.0000e-04	Tl-208	3.2400e-04
Tl-210	1.2600e-06	U-234	6.0000e-04	U-238	6.0000e-04

CASE: CRD2 5m x 5m no shield

RESULTS:

Group £	Energy (MeV)	Activity (photons/sec)	Dose point flux MeV/(sq cm)/sec	Dose rate (mr/hr)
1	2.5667	1.380e+07	4.312e+00	6.497e-03
2	1.6228	1.253e+07	2.212e+00	3.821e-03
3	1.1519	7.618e+06	8.736e-01	1.633e-03
4	.8769	3.199e+07	2.667e+00	5.278e-03
5	.5949	2.173e+07	1.260e+00	2.606e-03
6	.4752	5.865e+06	2.668e-01	5.443e-04
7	.3231	2.135e+07	5.510e-01	1.120e-03
8	.2393	1.996e+07	3.292e-01	6.371e-04
9	.1691	1.200e+06	1.187e-02	2.104e-05
10	.1210	1.793e+06	1.023e-02	1.632e-05
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
	TOTALS:	1.378e+08	1.249e+01	2.217e-02

Microshield 3.11

(HENRY MORTON - £098)

Page : 1
File : CRD3.MSH
Run date: August 18, 1998
Run time: 3:18 p.m.

File Ref: STEP Cat
Date: 8/18/98
By: [illegible]
Checked:

CASE: CRD3 100m x 100m no shield

GEOMETRY 11: Rectangular solid source - slab shields

Distance to detector.....	X	400.	cm.
Source width.....	W	10000.	"
Source length.....	L	10000.	"
Rectangular solid, thickness toward dose pt..	T1	300.	"
Thickness of second shield.....	T2	100.	"

Source Volume: 30000000000 cubic centimeters

MATERIAL DENSITIES (g/cc):

Material	Source	Shield 2
Air		.001220
Aluminum		
Carbon		
Concrete	1.60	
Hydrogen		
Iron		
Lead		
Lithium		
Nickel		
Tin		
Titanium		
Tungsten		
Urania		
Uranium		
Water		
Zirconium		

CASE: CRD3 100m x 100m no shield

BUILDUP FACTOR: based on TAYLOR method.
Using the characteristics of the materials in shield 1.

INTEGRATION PARAMETERS:

Number of lateral angle segments (Ntheta)..... **
Number of azimuthal angle segments (Npsi)..... **
Number of radial segments (Nradius)..... 41

SOURCE NUCLIDES:

Nuclide	Curies	Nuclide	Curies	Nuclide	Curies
Ac-228	3.6000e-01	Bi-210	2.4000e-01	Bi-212	3.6000e-01
Bi-214	2.4000e-01	Pa-234	3.1200e-04	Pa-234m	2.4000e-01
Pb-210	2.4000e-01	Pb-212	3.6000e-01	Pb-214	2.4000e-01
Po-210	2.4000e-01	Po-212	2.3000e-01	Po-214	2.4000e-01
Po-216	3.6000e-01	Po-218	2.4000e-01	Ra-224	3.6000e-01
Ra-226	2.4000e-01	Ra-228	3.6000e-01	Rn-220	3.6000e-01
Rn-222	2.4000e-01	Th-228	3.6000e-01	Th-230	2.4000e-01
Th-232	3.6000e-01	Th-234	2.4000e-01	Tl-208	1.3000e-01
Tl-210	5.0400e-04	U-234	2.4000e-01	U-238	2.4000e-01

CASE: CRD3 100m x 100m no shield

RESULTS:

Group £	Energy (MeV)	Activity (photons/sec)	Dose point flux MeV/(sq cm)/sec	Dose rate (mr/hr)
1	2.5668	5.536e+09	7.061e+00	1.064e-02
2	1.6228	5.011e+09	3.639e+00	6.285e-03
3	1.1519	3.047e+09	1.452e+00	2.714e-03
4	.8769	1.280e+10	4.465e+00	8.837e-03
5	.5948	8.703e+09	2.108e+00	4.358e-03
6	.4753	2.349e+09	4.501e-01	9.182e-04
7	.3231	8.541e+09	9.781e-01	1.989e-03
8	.2393	7.983e+09	6.157e-01	1.192e-03
9	.1691	4.799e+08	2.376e-02	4.211e-05
10	.1210	7.172e+08	2.272e-02	3.624e-05
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
	TOTALS:	5.516e+10	2.081e+01	3.701e-02

Microshield 3.11

(HENRY MORTON - £098)

Page : 1
File : CRD4.MSH
Run date: August 18, 1998
Run time: 2:56 p.m.

File Ref: Step Cbt
Date: 8/18/98
By: [illegible]
Checked:

CASE: CRD4 5m x 5m 6in concrete

GEOMETRY 11: Rectangular solid source - slab shields

Distance to detector.....	X	415.	cm.
Source width.....	W	500.	"
Source length.....	L	500.	"
Rectangular solid, thickness toward dose pt..	T1	300.	"
Thickness of second shield.....	T2	15.	"
Thickness of third shield.....	T3	100.	"

Source Volume: 75000000 cubic centimeters

MATERIAL DENSITIES (g/cc):

Material	Source	Shield 2	Shield 3
Air			.001220
Aluminum			
Carbon			
Concrete	1.60	2.350	
Hydrogen			
Iron			
Lead			
Lithium			
Nickel			
Tin			
Titanium			
Tungsten			
Urania			
Uranium			
Water			
Zirconium			

CASE: CRD4 5m x 5m 6in concrete

BUILDUP FACTOR: based on TAYLOR method.
Using the characteristics of the materials in shield 1.

INTEGRATION PARAMETERS:

Number of lateral angle segments (Ntheta)..... 41
Number of azimuthal angle segments (Npsi)..... 41
Number of radial segments (Nradius)..... 41

SOURCE NUCLIDES:

Nuclide	Curies	Nuclide	Curies	Nuclide	Curies
Ac-228	9.0000e-04	Bi-210	6.0000e-04	Bi-212	9.0000e-04
Bi-214	6.0000e-04	Pa-234	7.8000e-07	Pa-234m	6.0000e-04
Pb-210	6.0000e-04	Pb-212	9.0000e-04	Pb-214	6.0000e-04
Po-210	6.0000e-04	Po-212	5.7600e-04	Po-214	6.0000e-04
Po-216	9.0000e-04	Po-218	6.0000e-04	Ra-224	9.0000e-04
Ra-226	6.0000e-04	Ra-228	9.0000e-04	Rn-220	9.0000e-04
Rn-222	6.0000e-04	Th-228	9.0000e-04	Th-230	6.0000e-04
Th-232	9.0000e-04	Th-234	6.0000e-04	Tl-208	3.2400e-04
Tl-210	1.2600e-06	U-234	6.0000e-04	U-238	6.0000e-04

CASE: CRD4 5m x 5m 6in concrete

RESULTS:

Group £	Energy (MeV)	Activity (photons/sec)	Dose point flux MeV/(sq cm)/sec	Dose rate (mr/hr)
1	2.5667	1.380e+07	1.007e+00	1.518e-03
2	1.6228	1.253e+07	3.868e-01	6.680e-04
3	1.1519	7.618e+06	1.160e-01	2.169e-04
4	.8769	3.199e+07	2.903e-01	5.747e-04
5	.5949	2.173e+07	1.034e-01	2.137e-04
6	.4752	5.865e+06	1.747e-02	3.564e-05
7	.3231	2.135e+07	2.212e-02	4.496e-05
8	.2393	1.996e+07	8.523e-03	1.649e-05
9	.1691	1.200e+06	1.798e-04	3.187e-07
10	.1210	1.793e+06	6.937e-05	1.107e-07
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
	TOTALS:	1.378e+08	1.952e+00	3.289e-03

Microshield 3.11

(HENRY MORTON - £098)

Page : 1
File : CRD5.MSH
Run date: August 18, 1998
Run time: 3:01 p.m.

File Ref: STEPCAT
Date: 8/18/98
By: [signature]
Checked:

CASE: CRD5 inf slab no shield

GEOMETRY 14: Infinite slab source - slab shields

Distance to detector.....	X	400.	cm.
Source slab thickness.....	T1	300.	"
Thickness of second shield.....	T2	100.	"

MATERIAL DENSITIES (g/cc):

Material	Source	Shield 2
Air		.001220
Aluminum		
Carbon		
Concrete	1.60	
Hydrogen		
Iron		
Lead		
Lithium		
Nickel		
Tin		
Titanium		
Tungsten		
Urania		
Uranium		
Water		
Zirconium		

CASE: CRD5 inf slab no shield

RESULTS:

Group £	Energy (MeV)	Activity (photons/sec)	Dose point flux MeV/(sq cm)/sec	Dose rate (mr/hr)
1	2.5667	1.841e-01	6.706e+00	1.010e-02
2	1.6228	1.670e-01	3.424e+00	5.914e-03
3	1.1519	1.016e-01	1.352e+00	2.527e-03
4	.8769	4.265e-01	4.137e+00	8.187e-03
5	.5949	2.897e-01	1.982e+00	4.099e-03
6	.4752	7.819e-02	4.245e-01	8.661e-04
7	.3231	2.847e-01	8.921e-01	1.814e-03
8	.2393	2.661e-01	5.430e-01	1.051e-03
9	.1691	1.600e-02	2.006e-02	3.555e-05
10	.1210	2.391e-02	1.792e-02	2.860e-05
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
	TOTALS:	1.838e+00	1.950e+01	3.463e-02

APPENDIX D

RESRAD Output

CBRDTC

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

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)

```
D-5
D-5    Ra-226+D , fish                                  5.000E+01   5.000E+01   BIOFAC( 2,1)
D-5    Ra-226+D , crustacea and mollusks                2.500E+02   2.500E+02   BIOFAC( 2,2)
D-5
D-5    Ra-228+D , fish                                  5.000E+01   5.000E+01   BIOFAC( 3,1)
D-5    Ra-228+D , crustacea and mollusks                2.500E+02   2.500E+02   BIOFAC( 3,2)
D-5
D-5    Th-228+D , fish                                  1.000E+02   1.000E+02   BIOFAC( 4,1)
D-5    Th-228+D , crustacea and mollusks                5.000E+02   5.000E+02   BIOFAC( 4,2)
D-5
D-5    Th-230   , fish                                  1.000E+02   1.000E+02   BIOFAC( 5,1)
D-5    Th-230   , crustacea and mollusks                5.000E+02   5.000E+02   BIOFAC( 5,2)
D-5
D-5    Th-232   , fish                                  1.000E+02   1.000E+02   BIOFAC( 6,1)
D-5    Th-232   , crustacea and mollusks                5.000E+02   5.000E+02   BIOFAC( 6,2)
D-5
D-5    U-234    , fish                                  1.000E+01   1.000E+01   BIOFAC( 7,1)
D-5    U-234    , crustacea and mollusks                6.000E+01   6.000E+01   BIOFAC( 7,2)
D-5
D-5    U-238+D  , fish                                  1.000E+01   1.000E+01   BIOFAC( 8,1)
D-5    U-238+D  , crustacea and mollusks                6.000E+01   6.000E+01   BIOFAC( 8,2)
```


Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	7.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	5.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	7.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	5.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	5.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)

R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	0.000E+00	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	0.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	8.200E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

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            8 -- soil ingestion                active
            9 -- radon                       suppressed
            Find peak pathway doses          suppressed

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 Summary : CBRDTC Cabot Reading TC                                File: CBRDTC.RAD

     Contaminated Zone Dimensions            Initial Soil Concentrations, pCi/g

        Area:  10000.00 square meters                Pb-210     5.000E+00
   Thickness:       2.00 meters                      Ra-226     5.000E+00
 Cover Depth:       0.00 meters                      Ra-228     7.500E+00
                                                     Th-228     7.500E+00
                                                     Th-230     5.000E+00
                                                     Th-232     7.500E+00
                                                     U-234      5.000E+00
                                                     U-238      5.000E+00
0
                                  Total Dose TDOSE(t), mrem/yr
                              Basic Radiation Dose Limit =  30 mrem/yr
              Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

    t (years):  0.000E+00  1.000E+00  3.000E+00  1.000E+01  3.000E+01  1.000E+02  3.000E+02  1.000E+03
     TDOSE(t):  1.462E+00  1.462E+00  1.461E+00  1.459E+00  1.453E+00  1.432E+00  1.375E+00  1.191E+00
        M(t):  4.874E-02  4.873E-02  4.871E-02  4.864E-02  4.844E-02  4.775E-02  4.583E-02  3.970E-02
0Maximum TDOSE(t):  1.462E+00 mrem/yr   at t = 0.000E+00 years
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 Summary : CBRDTC Cabot Reading TC                                File: CBRDTC.RAD

                     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
0                                   Water Independent Pathways (Inhalation excludes radon)
0            Ground          Inhalation          Radon            Plant            Meat             Milk             Soil
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  2.420E-04 0.0002  3.868E-04 0.0003  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.071E-02 0.0073
 Ra-226  4.323E-01 0.2957  1.517E-04 0.0001  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  2.157E-03 0.0015
 Ra-228  4.176E-01 0.2856  1.477E-03 0.0010  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  3.325E-03 0.0023
 Th-228  4.960E-01 0.3392  7.352E-03 0.0050  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.521E-03 0.0010
 Th-230  1.413E-04 0.0001  5.521E-03 0.0038  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  8.204E-04 0.0006
 Th-232  2.391E-02 0.0164  4.172E-02 0.0285  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  6.326E-03 0.0043
 U-234   1.597E-05 0.0000  2.235E-03 0.0015  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.235E-04 0.0003
 U-238   5.297E-03 0.0036  1.998E-03 0.0014  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.025E-04 0.0003

 Total   1.376E+00 0.9408  6.085E-02 0.0416  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  2.569E-02 0.0176
0
                     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
0                                   Water Dependent Pathways
0            Water           Fish            Radon            Plant            Meat             Milk             All Pathways*
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.134E-02 0.0078
 Ra-226  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.346E-01 0.2973
 Ra-228  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.224E-01 0.2889
 Th-228  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  5.049E-01 0.3453
 Th-230  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  6.483E-03 0.0044
 Th-232  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  7.196E-02 0.0492
 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  2.675E-03 0.0018
 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  7.698E-03 0.0053

 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  1.462E+00 1.0000
0*Sum of all water independent and dependent pathways.
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 Summary : CBRDTC Cabot Reading TC                                File: CBRDTC.RAD

                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                  As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
0                                   Water Independent Pathways (Inhalation excludes radon)
0            Ground          Inhalation          Radon            Plant            Meat             Milk             Soil
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  2.345E-04 0.0002  3.749E-04 0.0003  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.038E-02 0.0071
 Ra-226  4.320E-01 0.2956  1.634E-04 0.0001  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  2.483E-03 0.0017
 Ra-228  5.116E-01 0.3500  3.406E-03 0.0023  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  3.381E-03 0.0023
 Th-228  3.452E-01 0.2361  5.116E-03 0.0035  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.059E-03 0.0007
 Th-230  3.285E-04 0.0002  5.520E-03 0.0038  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  8.213E-04 0.0006
 Th-232  8.057E-02 0.0551  4.202E-02 0.0287  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  6.731E-03 0.0046
 U-234   1.597E-05 0.0000  2.235E-03 0.0015  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.234E-04 0.0003
 U-238   5.296E-03 0.0036  1.998E-03 0.0014  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.024E-04 0.0003

 Total   1.375E+00 0.9408  6.083E-02 0.0416  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  2.568E-02 0.0176
0
                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                  As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
0                                   Water Dependent Pathways
0            Water           Fish            Radon            Plant            Meat             Milk             All Pathways*
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.099E-02 0.0075
 Ra-226  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.347E-01 0.2974
 Ra-228  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  5.184E-01 0.3546
 Th-228  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  3.514E-01 0.2404
 Th-230  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  6.669E-03 0.0046
 Th-232  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.293E-01 0.0885
 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  2.674E-03 0.0018
 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  7.696E-03 0.0053

 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  1.462E+00 1.0000
0*Sum of all water independent and dependent pathways.
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.203E-04	0.0002	3.522E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.751E-03	0.0067
Ra-226	4.315E-01	0.2953	1.858E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.105E-03	0.0021
Ra-228	5.576E-01	0.3816	4.984E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.133E-03	0.0021
Th-228	1.672E-01	0.1144	2.478E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.128E-04	0.0004
Th-230	7.023E-04	0.0005	5.517E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.234E-04	0.0006
Th-232	2.122E-01	0.1452	4.306E-02	0.0295	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.520E-03	0.0051
U-234	1.598E-05	0.0000	2.234E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.232E-04	0.0003
U-238	5.293E-03	0.0036	1.997E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.023E-04	0.0003
Total	1.375E+00	0.9408	6.081E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.567E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+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-02	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.348E-01	0.2976
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.657E-01	0.3872
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.702E-01	0.1165
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.043E-03	0.0048
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.628E-01	0.1798
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	2.673E-03	0.0018
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	7.693E-03	0.0053
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	1.461E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.770E-04	0.0001	2.829E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.833E-03	0.0054
Ra-226	4.296E-01	0.2944	2.536E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.993E-03	0.0034
Ra-228	3.272E-01	0.2243	3.441E-03	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.615E-03	0.0011
Th-228	1.322E-02	0.0091	1.959E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.053E-05	0.0000
Th-230	2.006E-03	0.0014	5.510E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.345E-04	0.0006
Th-232	5.952E-01	0.4079	4.681E-02	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.495E-03	0.0065
U-234	1.604E-05	0.0000	2.231E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.227E-04	0.0003
U-238	5.286E-03	0.0036	1.994E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.017E-04	0.0003
Total	1.373E+00	0.9408	6.072E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.564E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.293E-03	0.0057
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.349E-01	0.2980
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.323E-01	0.2277
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.345E-02	0.0092
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.350E-03	0.0057
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.515E-01	0.4465
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	2.670E-03	0.0018
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	7.682E-03	0.0053
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	1.459E+00	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	9.466E-05	0.0001	1.513E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.190E-03	0.0029
Ra-226	4.242E-01	0.2920	3.802E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.524E-03	0.0059
Ra-228	3.100E-02	0.0213	3.336E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.497E-04	0.0001
Th-228	9.381E-06	0.0000	1.390E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.877E-08	0.0000
Th-230	5.689E-03	0.0039	5.489E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.910E-04	0.0006
Th-232	9.008E-01	0.6199	4.991E-02	0.0343	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-02	0.0075
U-234	1.666E-05	0.0000	2.223E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.211E-04	0.0003
U-238	5.264E-03	0.0036	1.986E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.001E-04	0.0003
Total	1.367E+00	0.9408	6.047E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.553E-02	0.0176

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
0 Water Dependent Pathways

0 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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.436E-03	0.0031
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.332E-01	0.2981
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.148E-02	0.0217
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.549E-06	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.207E-02	0.0083
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.617E-01	0.6618
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	2.661E-03	0.0018
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	7.651E-03	0.0053
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	1.453E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	1.059E-05	0.0000	1.693E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.688E-04	0.0003
Ra-226	4.058E-01	0.2833	4.932E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.174E-02	0.0082
Ra-228	6.616E-06	0.0000	7.120E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.194E-08	0.0000
Th-228	8.941E-17	0.0000	1.325E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.742E-19	0.0000
Th-230	1.809E-02	0.0126	5.421E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.202E-03	0.0008
Th-232	9.185E-01	0.6412	4.953E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-02	0.0076
U-234	2.391E-05	0.0000	2.194E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.156E-04	0.0003
U-238	5.189E-03	0.0036	1.958E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.945E-04	0.0003
Total	1.348E+00	0.9408	5.961E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.517E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.964E-04	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.180E-01	0.2918
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.719E-06	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.101E-17	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.472E-02	0.0173
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.790E-01	0.6835
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	2.634E-03	0.0018
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	7.542E-03	0.0053
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	1.432E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	2.029E-08	0.0000	3.244E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.982E-07	0.0000
Ra-226	3.572E-01	0.2598	4.491E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.075E-02	0.0078
Ra-228	2.149E-16	0.0000	2.313E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-18	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	4.963E-02	0.0361	5.235E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.117E-03	0.0015
Th-232	8.816E-01	0.6412	4.754E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-02	0.0076
U-234	8.366E-05	0.0001	2.114E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.017E-04	0.0003
U-238	4.981E-03	0.0036	1.881E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.788E-04	0.0003
Total	1.293E+00	0.9408	5.722E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.416E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.510E-07	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.684E-01	0.2679
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.182E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.698E-02	0.0414
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.397E-01	0.6835
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	2.600E-03	0.0019
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	7.240E-03	0.0053
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	1.375E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	6.247E-18	0.0000	9.986E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.765E-16	0.0000
Ra-226	2.285E-01	0.1918	2.873E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.877E-03	0.0058
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.234E-01	0.1036	4.608E-03	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.251E-03	0.0036
Th-232	7.637E-01	0.6412	4.118E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.102E-03	0.0076
U-234	6.093E-04	0.0005	1.857E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.668E-04	0.0003
U-238	4.315E-03	0.0036	1.633E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.289E-04	0.0003
Total	1.121E+00	0.9408	4.956E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.093E-02	0.0176

0

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

0

0 Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.927E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.356E-01	0.1978
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.323E-01	0.1110
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.140E-01	0.6835
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	2.833E-03	0.0024
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	6.277E-03	0.0053
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	1.191E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.268E-03	2.198E-03	2.065E-03	1.659E-03	8.872E-04	9.927E-05	1.902E-07	5.854E-17
0Ra-226	Ra-226	1.000E+00	8.689E-02	8.683E-02	8.672E-02	8.633E-02	8.524E-02	8.151E-02	7.175E-02	4.589E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	1.048E-04	2.370E-04	6.385E-04	1.391E-03	2.090E-03	1.928E-03	1.234E-03
Ra-226	DSR(j)		8.689E-02	8.694E-02	8.696E-02	8.697E-02	8.663E-02	8.360E-02	7.367E-02	4.713E-02
0Ra-228	Ra-228	1.000E+00	4.392E-02	3.892E-02	3.057E-02	1.313E-02	1.173E-03	2.503E-07	8.128E-18	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	3.020E-02	4.486E-02	3.118E-02	3.025E-03	6.456E-07	2.097E-17	0.000E+00
Ra-228	DSR(j)		4.392E-02	6.912E-02	7.543E-02	4.431E-02	4.198E-03	8.959E-07	2.910E-17	0.000E+00
0Th-228	Th-228	1.000E+00	6.732E-02	4.685E-02	2.269E-02	1.794E-03	1.273E-06	1.213E-17	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	1.278E-03	1.277E-03	1.277E-03	1.275E-03	1.270E-03	1.251E-03	1.198E-03	1.031E-03
Th-230	Ra-226	1.000E+00	0.000E+00	5.644E-05	1.316E-04	3.936E-04	1.134E-03	3.626E-03	9.961E-03	2.478E-02
Th-230	Pb-210	1.000E+00	0.000E+00	3.558E-08	1.842E-07	1.533E-06	1.065E-05	6.698E-05	2.372E-04	6.398E-04
Th-230	DSR(j)		1.278E-03	1.334E-03	1.409E-03	1.670E-03	2.414E-03	4.943E-03	1.140E-02	2.645E-02
0Th-232	Th-232	1.000E+00	6.376E-03	6.374E-03	6.372E-03	6.363E-03	6.337E-03	6.246E-03	5.995E-03	5.194E-03
Th-232	Ra-228	1.000E+00	0.000E+00	7.686E-03	1.602E-02	3.339E-02	4.516E-02	4.567E-02	4.383E-02	3.797E-02
Th-232	Th-228	1.000E+00	0.000E+00	3.183E-03	1.265E-02	4.711E-02	7.673E-02	7.862E-02	7.546E-02	6.537E-02
Th-232	DSR(j)		6.376E-03	1.724E-02	3.504E-02	8.686E-02	1.282E-01	1.305E-01	1.253E-01	1.085E-01
0U-234	U-234	1.000E+00	5.350E-04	5.349E-04	5.346E-04	5.339E-04	5.316E-04	5.240E-04	5.026E-04	4.346E-04
U-234	Th-230	1.000E+00	0.000E+00	1.725E-08	4.023E-08	1.205E-07	3.486E-07	1.132E-06	3.244E-06	9.319E-06
U-234	Ra-226	1.000E+00	0.000E+00	3.952E-10	2.088E-09	1.863E-08	1.560E-07	1.652E-06	1.377E-05	1.197E-04
U-234	Pb-210	1.000E+00	0.000E+00	1.722E-13	1.979E-12	4.969E-11	1.049E-09	2.439E-08	2.962E-07	2.988E-06
U-234	DSR(j)		5.350E-04	5.349E-04	5.347E-04	5.340E-04	5.321E-04	5.268E-04	5.199E-04	5.666E-04
0U-238	U-238	1.000E+00	1.540E-03	1.539E-03	1.539E-03	1.536E-03	1.530E-03	1.508E-03	1.448E-03	1.254E-03
U-238	U-234	1.000E+00	0.000E+00	2.274E-09	5.305E-09	1.589E-08	4.597E-08	1.493E-07	4.284E-07	1.234E-06
U-238	Th-230	1.000E+00	0.000E+00	3.803E-14	2.009E-13	1.795E-12	1.507E-11	1.613E-10	1.383E-09	1.324E-08
U-238	Ra-226	1.000E+00	0.000E+00	5.923E-16	6.991E-15	1.852E-13	4.501E-12	1.575E-10	3.953E-09	1.173E-07
U-238	Pb-210	1.000E+00	0.000E+00	1.273E-19	4.942E-18	3.765E-16	2.368E-14	1.950E-12	7.775E-11	2.836E-09
U-238	DSR(j)		1.540E-03	1.539E-03	1.539E-03	1.536E-03	1.530E-03	1.508E-03	1.448E-03	1.255E-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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	1.323E+04	1.365E+04	1.453E+04	1.809E+04	3.382E+04	3.022E+05	1.577E+08	*7.631E+13
Ra-226	3.451E+02	3.451E+02	3.450E+02	3.449E+02	3.463E+02	3.588E+02	4.072E+02	6.366E+02
Ra-228	5.326E+02	4.340E+02	3.977E+02	6.771E+02	7.147E+03	3.349E+07	*2.726E+14	*2.726E+14
Th-228	4.457E+02	6.404E+02	1.322E+03	1.673E+04	2.356E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	2.314E+04	2.249E+04	2.130E+04	1.796E+04	1.243E+04	6.069E+03	2.632E+03	1.134E+03
Th-232	3.127E+03	1.740E+03	8.563E+02	3.454E+02	2.340E+02	2.298E+02	2.394E+02	2.764E+02
U-234	5.608E+04	5.609E+04	5.611E+04	5.618E+04	5.638E+04	5.695E+04	5.770E+04	5.295E+04
U-238	1.949E+04	1.949E+04	1.950E+04	1.953E+04	1.961E+04	1.989E+04	2.072E+04	2.390E+04

*At specific activity limit

0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	5.000E+00	0.000E+00	2.268E-03	1.323E+04	2.268E-03	1.323E+04
Ra-226	5.000E+00	7.56 ñ 0.02	8.698E-02	3.449E+02	8.692E-02	3.451E+02
Ra-228	7.500E+00	2.712 ñ 0.005	7.556E-02	3.970E+02	5.633E-02	5.326E+02
Th-228	7.500E+00	0.000E+00	6.732E-02	4.457E+02	6.732E-02	4.457E+02
Th-230	5.000E+00	1.000E+03	2.645E-02	1.134E+03	1.297E-03	2.314E+04
Th-232	7.500E+00	54.2 ñ 0.1	1.315E-01	2.281E+02	9.595E-03	3.127E+03
U-234	5.000E+00	1.000E+03	5.666E-04	5.295E+04	5.350E-04	5.608E+04
U-238	5.000E+00	0.000E+00	1.540E-03	1.949E+04	1.540E-03	1.949E+04

Individual Nuclide Dose Summed Over All Pathways

Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	1.134E-02	1.099E-02	1.032E-02	8.293E-03	4.436E-03	4.964E-04	9.510E-07	2.927E-16
Pb-210	Ra-226	1.000E+00	1.771E-04	5.239E-04	1.185E-03	3.193E-03	6.957E-03	1.045E-02	9.641E-03	6.168E-03
Pb-210	Th-230	1.000E+00	2.564E-08	1.779E-07	9.211E-07	7.667E-06	5.327E-05	3.349E-04	1.186E-03	3.199E-03
Pb-210	U-234	1.000E+00	5.780E-14	8.611E-13	9.893E-12	2.484E-10	5.243E-09	1.220E-07	1.481E-06	1.494E-05
Pb-210	U-238	1.000E+00	0.000E+00	6.365E-19	2.471E-17	1.882E-15	1.184E-13	9.748E-12	3.888E-10	1.418E-08
Pb-210	DOSE(j):		1.152E-02	1.151E-02	1.151E-02	1.149E-02	1.145E-02	1.128E-02	1.083E-02	9.382E-03
0Ra-226	Ra-226	1.000E+00	4.344E-01	4.342E-01	4.336E-01	4.317E-01	4.262E-01	4.076E-01	3.587E-01	2.295E-01
Ra-226	Th-230	1.000E+00	9.411E-05	2.822E-04	6.579E-04	1.968E-03	5.668E-03	1.813E-02	4.981E-02	1.239E-01
Ra-226	U-234	1.000E+00	2.824E-10	1.976E-09	1.044E-08	9.315E-08	7.799E-07	8.260E-06	6.884E-05	5.986E-04
Ra-226	U-238	1.000E+00	1.687E-16	2.961E-15	3.496E-14	9.259E-13	2.251E-11	7.874E-10	1.976E-08	5.864E-07
Ra-226	DOSE(j):		4.345E-01	4.344E-01	4.343E-01	4.336E-01	4.319E-01	4.257E-01	4.086E-01	3.540E-01
0Ra-228	Ra-228	1.000E+00	3.294E-01	2.919E-01	2.293E-01	9.846E-02	8.799E-03	1.877E-06	6.096E-17	0.000E+00
Ra-228	Th-232	1.000E+00	2.025E-02	5.764E-02	1.201E-01	2.504E-01	3.387E-01	3.425E-01	3.288E-01	2.848E-01
Ra-228	DOSE(j):		3.496E-01	3.495E-01	3.494E-01	3.489E-01	3.475E-01	3.425E-01	3.288E-01	2.848E-01
0Th-228	Ra-228	1.000E+00	9.308E-02	2.265E-01	3.365E-01	2.338E-01	2.268E-02	4.842E-06	1.573E-16	0.000E+00
Th-228	Th-228	1.000E+00	5.049E-01	3.514E-01	1.702E-01	1.345E-02	9.549E-06	9.101E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	3.891E-03	2.387E-02	9.485E-02	3.533E-01	5.755E-01	5.896E-01	5.659E-01	4.903E-01
Th-228	DOSE(j):		6.018E-01	6.017E-01	6.015E-01	6.006E-01	5.982E-01	5.896E-01	5.659E-01	4.903E-01
0Th-230	Th-230	1.000E+00	6.388E-03	6.387E-03	6.384E-03	6.375E-03	6.348E-03	6.253E-03	5.991E-03	5.157E-03
Th-230	U-234	1.000E+00	2.875E-08	8.624E-08	2.011E-07	6.026E-07	1.743E-06	5.659E-06	1.622E-05	4.659E-05
Th-230	U-238	1.000E+00	2.717E-14	1.902E-13	1.005E-12	8.975E-12	7.536E-11	8.063E-10	6.914E-09	6.621E-08
Th-230	DOSE(j):		6.388E-03	6.387E-03	6.385E-03	6.375E-03	6.349E-03	6.259E-03	6.007E-03	5.204E-03
0Th-232	Th-232	1.000E+00	4.782E-02	4.781E-02	4.779E-02	4.772E-02	4.753E-02	4.685E-02	4.497E-02	3.895E-02
0U-234	U-234	1.000E+00	2.675E-03	2.674E-03	2.673E-03	2.669E-03	2.658E-03	2.620E-03	2.513E-03	2.173E-03
U-234	U-238	1.000E+00	3.791E-09	1.137E-08	2.652E-08	7.946E-08	2.299E-07	7.465E-07	2.142E-06	6.171E-06
U-234	DOSE(j):		2.675E-03	2.674E-03	2.673E-03	2.669E-03	2.658E-03	2.621E-03	2.515E-03	2.179E-03
0U-238	U-238	1.000E+00	7.698E-03	7.696E-03	7.693E-03	7.682E-03	7.650E-03	7.541E-03	7.238E-03	6.270E-03

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

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Summary : CBRDTC Cabot Reading TC File: CBRDTC.RAD

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.000E+00	4.846E+00	4.552E+00	3.657E+00	1.956E+00	2.189E-01	4.193E-04	1.291E-13
Pb-210	Ra-226	1.000E+00	0.000E+00	1.530E-01	4.446E-01	1.330E+00	2.991E+00	4.535E+00	4.187E+00	2.678E+00
Pb-210	Th-230	1.000E+00	0.000E+00	3.331E-05	2.935E-04	3.032E-03	2.248E-02	1.444E-01	5.140E-01	1.388E+00
Pb-210	U-234	1.000E+00	0.000E+00	1.002E-10	2.662E-09	9.333E-08	2.173E-06	5.229E-05	6.407E-04	6.480E-03
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	5.714E-15	6.717E-13	4.822E-11	4.157E-09	1.679E-07	6.146E-06
Pb-210	S(j):		5.000E+00	4.999E+00	4.997E+00	4.990E+00	4.969E+00	4.899E+00	4.702E+00	4.073E+00
0Ra-226	Ra-226	1.000E+00	5.000E+00	4.997E+00	4.990E+00	4.968E+00	4.905E+00	4.691E+00	4.129E+00	2.641E+00
Ra-226	Th-230	1.000E+00	0.000E+00	2.165E-03	6.490E-03	2.157E-02	6.416E-02	2.076E-01	5.722E-01	1.425E+00
Ra-226	U-234	1.000E+00	0.000E+00	9.746E-09	8.765E-08	9.715E-07	8.682E-06	9.411E-05	7.895E-04	6.881E-03
Ra-226	U-238	1.000E+00	0.000E+00	8.832E-15	2.480E-13	9.183E-12	2.464E-10	8.927E-09	2.263E-07	6.737E-06
Ra-226	S(j):		5.000E+00	4.999E+00	4.997E+00	4.990E+00	4.969E+00	4.899E+00	4.702E+00	4.073E+00
0Ra-228	Ra-228	1.000E+00	7.500E+00	6.647E+00	5.221E+00	2.242E+00	2.004E-01	4.274E-05	1.388E-15	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	8.516E-01	2.275E+00	5.243E+00	7.254E+00	7.348E+00	7.053E+00	6.109E+00
Ra-228	S(j):		7.500E+00	7.498E+00	7.495E+00	7.485E+00	7.454E+00	7.348E+00	7.053E+00	6.109E+00
0Th-228	Ra-228	1.000E+00	0.000E+00	2.139E+00	4.036E+00	3.060E+00	3.000E-01	6.405E-05	2.080E-15	0.000E+00
Th-228	Th-228	1.000E+00	7.500E+00	5.219E+00	2.528E+00	1.998E-01	1.419E-04	1.352E-15	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	1.398E-01	9.319E-01	4.224E+00	7.154E+00	7.348E+00	7.053E+00	6.109E+00
Th-228	S(j):		7.500E+00	7.498E+00	7.495E+00	7.485E+00	7.454E+00	7.348E+00	7.053E+00	6.109E+00
0Th-230	Th-230	1.000E+00	5.000E+00	4.999E+00	4.997E+00	4.989E+00	4.968E+00	4.894E+00	4.689E+00	4.036E+00
Th-230	U-234	1.000E+00	0.000E+00	4.500E-05	1.349E-04	4.491E-04	1.342E-03	4.407E-03	1.267E-02	3.645E-02
Th-230	U-238	1.000E+00	0.000E+00	6.379E-11	5.738E-10	6.367E-09	5.706E-08	6.248E-07	5.393E-06	5.177E-05
Th-230	S(j):		5.000E+00	4.999E+00	4.997E+00	4.990E+00	4.969E+00	4.899E+00	4.702E+00	4.073E+00
0Th-232	Th-232	1.000E+00	7.500E+00	7.498E+00	7.495E+00	7.485E+00	7.454E+00	7.348E+00	7.053E+00	6.109E+00
0U-234	U-234	1.000E+00	5.000E+00	4.999E+00	4.997E+00	4.990E+00	4.969E+00	4.897E+00	4.698E+00	4.061E+00
U-234	U-238	1.000E+00	0.000E+00	1.417E-05	4.250E-05	1.415E-04	4.226E-04	1.389E-03	3.997E-03	1.153E-02
U-234	S(j):		5.000E+00	4.999E+00	4.997E+00	4.990E+00	4.969E+00	4.899E+00	4.702E+00	4.073E+00
0U-238	U-238	1.000E+00	5.000E+00	4.999E+00	4.997E+00	4.990E+00	4.969E+00	4.899E+00	4.702E+00	4.073E+00

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

0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time = 249.09 seconds

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

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				

D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	7.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	5.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	7.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	5.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	5.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				

R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-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)	2.280E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

Pb-210	5.000E+00
Ra-226	5.000E+00
Ra-228	7.500E+00
Th-228	7.500E+00
Th-230	5.000E+00
Th-232	7.500E+00
U-234	5.000E+00
U-238	5.000E+00

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	4.065E-01	4.064E-01	4.063E-01	4.057E-01	4.040E-01	3.983E-01	3.823E-01	3.312E-01
M(t):	1.355E-02	1.355E-02	1.354E-02	1.352E-02	1.347E-02	1.328E-02	1.274E-02	1.104E-02

0Maximum TDOSE(t): 4.065E-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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	6.729E-05	0.0002	1.076E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.978E-03	0.0073
Ra-226	1.202E-01	0.2957	4.217E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.998E-04	0.0015
Ra-228	1.161E-01	0.2856	4.107E-04	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.246E-04	0.0023
Th-228	1.379E-01	0.3392	2.044E-03	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.230E-04	0.0010
Th-230	3.929E-05	0.0001	1.535E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.281E-04	0.0006
Th-232	6.648E-03	0.0164	1.160E-02	0.0285	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.759E-03	0.0043
U-234	4.442E-06	0.0000	6.216E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.177E-04	0.0003
U-238	1.473E-03	0.0036	5.556E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E-04	0.0003
Total	3.825E-01	0.9408	1.692E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.142E-03	0.0176

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.153E-03	0.0078
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.208E-01	0.2973
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-01	0.2889
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.404E-01	0.3453
Th-230	0.000E+00	0.0000	0.000E+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-03	0.0044
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.001E-02	0.0492
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.437E-04	0.0018
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	2.140E-03	0.0053
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	4.065E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	6.522E-05	0.0002	1.042E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.886E-03	0.0071
Ra-226	1.201E-01	0.2956	4.543E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.905E-04	0.0017
Ra-228	1.423E-01	0.3500	9.470E-04	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.401E-04	0.0023
Th-228	9.598E-02	0.2361	1.423E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.944E-04	0.0007
Th-230	9.133E-05	0.0002	1.535E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-04	0.0006
Th-232	2.240E-02	0.0551	1.168E-02	0.0287	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.872E-03	0.0046
U-234	4.441E-06	0.0000	6.214E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.177E-04	0.0003
U-238	1.472E-03	0.0036	5.555E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E-04	0.0003
Total	3.824E-01	0.9408	1.691E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.141E-03	0.0176

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.056E-03	0.0075
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.209E-01	0.2974
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.441E-01	0.3546
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.769E-02	0.2404
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.854E-03	0.0046
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.596E-02	0.0885
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.436E-04	0.0018
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	2.140E-03	0.0053
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	4.064E-01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	6.126E-05	0.0002	9.793E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.711E-03	0.0067
Ra-226	1.200E-01	0.2953	5.165E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.634E-04	0.0021
Ra-228	1.550E-01	0.3816	1.386E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.713E-04	0.0021
Th-228	4.648E-02	0.1144	6.890E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.426E-04	0.0004
Th-230	1.953E-04	0.0005	1.534E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.289E-04	0.0006
Th-232	5.900E-02	0.1452	1.197E-02	0.0295	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.091E-03	0.0051
U-234	4.442E-06	0.0000	6.212E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.177E-04	0.0003
U-238	1.472E-03	0.0036	5.553E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E-04	0.0003
Total	3.822E-01	0.9408	1.691E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.138E-03	0.0176

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
0 Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.871E-03	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.209E-01	0.2976
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.573E-01	0.3872
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.731E-02	0.1165
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.958E-03	0.0048
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.306E-02	0.1798
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.433E-04	0.0018
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	2.139E-03	0.0053
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	4.063E-01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.921E-05	0.0001	7.866E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.178E-03	0.0054
Ra-226	1.195E-01	0.2944	7.051E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.388E-03	0.0034
Ra-228	9.099E-02	0.2243	9.569E-04	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.490E-04	0.0011
Th-228	3.674E-03	0.0091	5.446E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.127E-05	0.0000
Th-230	5.578E-04	0.0014	1.532E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.320E-04	0.0006
Th-232	1.655E-01	0.4079	1.302E-02	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.640E-03	0.0065
U-234	4.459E-06	0.0000	6.204E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-04	0.0003
U-238	1.470E-03	0.0036	5.545E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-04	0.0003
Total	3.817E-01	0.9408	1.688E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.128E-03	0.0176

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years
0 Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.306E-03	0.0057
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.209E-01	0.2980
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.240E-02	0.2277
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.740E-03	0.0092
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.322E-03	0.0057
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.811E-01	0.4465
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.424E-04	0.0018
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	2.136E-03	0.0053
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	4.057E-01	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.632E-05	0.0001	4.207E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.165E-03	0.0029
Ra-226	1.180E-01	0.2920	1.057E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.370E-03	0.0059
Ra-228	8.619E-03	0.0213	9.275E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.162E-05	0.0001
Th-228	2.608E-06	0.0000	3.866E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.001E-09	0.0000
Th-230	1.582E-03	0.0039	1.526E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.477E-04	0.0006
Th-232	2.505E-01	0.6199	1.388E-02	0.0343	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.046E-03	0.0075
U-234	4.633E-06	0.0000	6.181E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.171E-04	0.0003
U-238	1.464E-03	0.0036	5.523E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.112E-04	0.0003
Total	3.801E-01	0.9408	1.681E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.099E-03	0.0176

0

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
0 Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.233E-03	0.0031
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.204E-01	0.2981

Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.754E-03	0.0217
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.655E-06	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.356E-03	0.0083
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.674E-01	0.6618
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.398E-04	0.0018
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	2.127E-03	0.0053
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	4.040E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.945E-06	0.0000	4.708E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.304E-04	0.0003
Ra-226	1.128E-01	0.2833	1.371E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.264E-03	0.0082
Ra-228	1.840E-06	0.0000	1.980E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.882E-09	0.0000
Th-228	2.486E-17	0.0000	3.685E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.625E-20	0.0000
Th-230	5.031E-03	0.0126	1.507E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.342E-04	0.0008
Th-232	2.554E-01	0.6412	1.377E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.044E-03	0.0076
U-234	6.648E-06	0.0000	6.101E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-04	0.0003
U-238	1.443E-03	0.0036	5.445E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-04	0.0003
Total	3.747E-01	0.9408	1.657E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.997E-03	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E-00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.380E-04	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.162E-01	0.2918
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.868E-06	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.531E-17	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.872E-03	0.0173
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.722E-01	0.6835
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.323E-04	0.0018
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	2.097E-03	0.0053
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.983E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.643E-09	0.0000	9.020E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.498E-07	0.0000
Ra-226	9.931E-02	0.2598	1.249E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.989E-03	0.0078
Ra-228	5.975E-17	0.0000	6.430E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.885E-19	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.380E-02	0.0361	1.455E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.887E-04	0.0015
Th-232	2.451E-01	0.6412	1.322E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.921E-03	0.0076
U-234	2.326E-05	0.0001	5.879E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-04	0.0003
U-238	1.385E-03	0.0036	5.230E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-04	0.0003
Total	3.597E-01	0.9408	1.591E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.716E-03	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.644E-07	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.024E-01	0.2679
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.068E-17	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.584E-02	0.0414
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.613E-01	0.6835
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.228E-04	0.0019
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	2.013E-03	0.0053
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.823E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.737E-18	0.0000	2.777E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.688E-17	0.0000
Ra-226	6.353E-02	0.1918	7.989E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.912E-03	0.0058
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	3.431E-02	0.1036	1.281E-03	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-03	0.0036
Th-232	2.124E-01	0.6412	1.145E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.531E-03	0.0076
U-234	1.694E-04	0.0005	5.163E-04	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.020E-04	0.0003

U-238	1.200E-03	0.0036	4.541E-04	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.145E-05	0.0003
Total	3.116E-01	0.9408	1.378E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.818E-03	0.0176

0

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

0

	Water Dependent Pathways													
0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.139E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.552E-02	0.1978
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.677E-02	0.1110
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.263E-01	0.6835
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.877E-04	0.0024
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	1.745E-03	0.0053
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.312E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	6.306E-04	6.112E-04	5.741E-04	4.612E-04	2.467E-04	2.760E-05	5.288E-08	1.628E-17
0Ra-226	Ra-226	1.000E+00	2.416E-02	2.414E-02	2.411E-02	2.401E-02	2.370E-02	2.266E-02	1.995E-02	1.276E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	2.913E-05	6.590E-05	1.775E-04	3.869E-04	5.812E-04	5.362E-04	3.430E-04
Ra-226	DSR(j)		2.416E-02	2.417E-02	2.418E-02	2.418E-02	2.409E-02	2.325E-02	2.048E-02	1.310E-02
0Ra-228	Ra-228	1.000E+00	1.221E-02	1.082E-02	8.500E-03	3.650E-03	3.262E-04	6.959E-08	2.260E-18	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	8.397E-03	1.247E-02	8.669E-03	8.410E-04	1.795E-07	5.830E-18	0.000E+00
Ra-228	DSR(j)		1.221E-02	1.922E-02	2.097E-02	1.232E-02	1.167E-03	2.491E-07	8.090E-18	0.000E+00
0Th-228	Th-228	1.000E+00	1.872E-02	1.303E-02	6.308E-03	4.987E-04	3.540E-07	3.374E-18	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	3.553E-04	3.552E-04	3.550E-04	3.545E-04	3.530E-04	3.477E-04	3.332E-04	2.868E-04
Th-230	Ra-226	1.000E+00	0.000E+00	1.569E-05	3.659E-05	1.094E-04	3.152E-04	1.008E-03	2.770E-03	6.890E-03
Th-230	Pb-210	1.000E+00	0.000E+00	9.892E-09	5.122E-08	4.264E-07	2.963E-06	1.862E-05	6.596E-05	1.779E-04
Th-230	DSR(j)		3.553E-04	3.709E-04	3.917E-04	4.644E-04	6.711E-04	1.374E-03	3.169E-03	7.355E-03
0Th-232	Th-232	1.000E+00	1.773E-03	1.772E-03	1.772E-03	1.769E-03	1.762E-03	1.737E-03	1.667E-03	1.444E-03
Th-232	Ra-228	1.000E+00	0.000E+00	2.137E-03	4.454E-03	9.285E-03	1.256E-02	1.270E-02	1.219E-02	1.056E-02
Th-232	Th-228	1.000E+00	0.000E+00	8.849E-04	3.516E-03	1.310E-02	2.133E-02	2.186E-02	2.098E-02	1.818E-02
Th-232	DSR(j)		1.773E-03	4.794E-03	9.742E-03	2.415E-02	3.565E-02	3.629E-02	3.484E-02	3.018E-02
0U-234	U-234	1.000E+00	1.487E-04	1.487E-04	1.487E-04	1.484E-04	1.478E-04	1.457E-04	1.398E-04	1.208E-04
U-234	Th-230	1.000E+00	0.000E+00	4.796E-09	1.119E-08	3.351E-08	9.692E-08	3.147E-07	9.021E-07	2.591E-06
U-234	Ra-226	1.000E+00	0.000E+00	1.099E-10	5.804E-10	5.180E-09	4.337E-08	4.594E-07	3.828E-06	3.329E-05
U-234	Pb-210	1.000E+00	0.000E+00	4.788E-14	5.502E-13	1.382E-11	2.915E-10	6.782E-09	8.237E-08	8.308E-07
U-234	DSR(j)		1.487E-04	1.487E-04	1.487E-04	1.485E-04	1.480E-04	1.465E-04	1.446E-04	1.575E-04
0U-238	U-238	1.000E+00	4.281E-04	4.280E-04	4.278E-04	4.272E-04	4.254E-04	4.194E-04	4.025E-04	3.487E-04
U-238	U-234	1.000E+00	0.000E+00	6.324E-10	1.475E-09	4.419E-09	1.278E-08	4.151E-08	1.191E-07	3.432E-07
U-238	Th-230	1.000E+00	0.000E+00	1.057E-14	5.587E-14	4.991E-13	4.191E-12	4.484E-11	3.845E-10	3.682E-09
U-238	Ra-226	1.000E+00	0.000E+00	1.647E-16	1.944E-15	5.149E-14	1.252E-12	4.379E-11	1.099E-09	3.261E-08
U-238	Pb-210	1.000E+00	0.000E+00	3.540E-20	1.374E-18	1.047E-16	6.584E-15	5.421E-13	2.162E-11	7.885E-10
U-238	DSR(j)		4.281E-04	4.280E-04	4.278E-04	4.272E-04	4.254E-04	4.194E-04	4.026E-04	3.491E-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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	4.757E+04	4.908E+04	5.225E+04	6.505E+04	1.216E+05	1.087E+06	5.673E+08	*7.631E+13
Ra-226	1.241E+03	1.241E+03	1.241E+03	1.241E+03	1.245E+03	1.291E+03	1.464E+03	2.289E+03
Ra-228	1.916E+03	1.561E+03	1.430E+03	2.435E+03	2.570E+04	1.204E+08	*2.726E+14	*2.726E+14
Th-228	1.603E+03	2.303E+03	4.756E+03	6.016E+04	8.474E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	8.322E+04	8.089E+04	7.660E+04	6.460E+04	4.470E+04	2.183E+04	9.467E+03	4.079E+03
Th-232	1.125E+04	6.257E+03	3.080E+03	1.242E+03	8.415E+02	8.266E+02	8.612E+02	9.941E+02
U-234	2.017E+05	2.017E+05	2.018E+05	2.021E+05	2.028E+05	2.048E+05	2.075E+05	1.904E+05
U-238	7.008E+04	7.010E+04	7.013E+04	7.023E+04	7.051E+04	7.153E+04	7.451E+04	8.594E+04

*At specific activity limit

0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	5.000E+00	0.000E+00	6.306E-04	4.757E+04	6.306E-04	4.757E+04
Ra-226	5.000E+00	7.61 ñ 0.02	2.418E-02	1.240E+03	2.417E-02	1.241E+03
Ra-228	7.500E+00	2.712 ñ 0.005	2.101E-02	1.428E+03	1.566E-02	1.916E+03
Th-228	7.500E+00	0.000E+00	1.872E-02	1.603E+03	1.872E-02	1.603E+03
Th-230	5.000E+00	1.000E+03	7.355E-03	4.079E+03	3.605E-04	8.322E+04
Th-232	7.500E+00	54.2 ñ 0.1	3.657E-02	8.203E+02	2.668E-03	1.125E+04
U-234	5.000E+00	1.000E+03	1.575E-04	1.904E+05	1.487E-04	2.017E+05
U-238	5.000E+00	0.000E+00	4.281E-04	7.008E+04	4.281E-04	7.008E+04

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

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 Pb-210  Pb-210  1.000E+00    3.153E-03 3.056E-03 2.871E-03 2.306E-03 1.233E-03 1.380E-04 2.644E-07 8.139E-17
 Pb-210  Ra-226  1.000E+00    4.925E-05 1.457E-04 3.295E-04 8.877E-04 1.935E-03 2.906E-03 2.681E-03 1.715E-03
 Pb-210  Th-230  1.000E+00    7.130E-09 4.946E-08 2.561E-07 2.132E-06 1.481E-05 9.312E-05 3.298E-04 8.894E-04
 Pb-210  U-234   1.000E+00    1.607E-14 2.394E-13 2.751E-12 6.908E-11 1.458E-09 3.391E-08 4.118E-07 4.154E-06
 Pb-210  U-238   1.000E+00    0.000E+00 1.770E-19 6.871E-18 5.234E-16 3.292E-14 2.710E-12 1.081E-10 3.942E-09
 Pb-210  DOSE(j):            3.202E-03 3.202E-03 3.200E-03 3.196E-03 3.183E-03 3.137E-03 3.011E-03 2.609E-03
0Ra-226  Ra-226  1.000E+00    1.208E-01 1.207E-01 1.206E-01 1.200E-01 1.185E-01 1.133E-01 9.974E-02 6.380E-02
 Ra-226  Th-230  1.000E+00    2.617E-05 7.847E-05 1.829E-04 5.472E-04 1.576E-03 5.041E-03 1.385E-02 3.445E-02
 Ra-226  U-234   1.000E+00    7.852E-11 5.494E-10 2.902E-09 2.590E-08 2.168E-07 2.297E-06 1.914E-05 1.664E-04
 Ra-226  U-238   1.000E+00    4.692E-17 8.234E-16 9.720E-15 2.575E-13 6.258E-12 2.189E-10 5.495E-09 1.630E-07
 Ra-226  DOSE(j):            1.208E-01 1.208E-01 1.207E-01 1.206E-01 1.201E-01 1.184E-01 1.136E-01 9.842E-02
0Ra-228  Ra-228  1.000E+00    9.158E-02 8.116E-02 6.375E-02 2.738E-02 2.446E-03 5.219E-07 1.695E-17 0.000E+00
 Ra-228  Th-232  1.000E+00    5.630E-03 1.603E-02 3.340E-02 6.963E-02 9.417E-02 9.524E-02 9.141E-02 7.919E-02
 Ra-228  DOSE(j):            9.721E-02 9.719E-02 9.715E-02 9.701E-02 9.661E-02 9.524E-02 9.141E-02 7.919E-02
0Th-228  Ra-228  1.000E+00    2.588E-02 6.298E-02 9.355E-02 6.502E-02 6.307E-03 1.346E-06 4.373E-17 0.000E+00
 Th-228  Th-228  1.000E+00    1.404E-01 9.769E-02 4.731E-02 3.740E-03 2.655E-06 2.531E-17 0.000E+00 0.000E+00
 Th-228  Th-232  1.000E+00    1.082E-03 6.637E-03 2.637E-02 9.824E-02 1.600E-01 1.639E-01 1.574E-01 1.363E-01
 Th-228  DOSE(j):            1.673E-01 1.673E-01 1.672E-01 1.670E-01 1.663E-01 1.639E-01 1.574E-01 1.363E-01
0Th-230  Th-230  1.000E+00    1.776E-03 1.776E-03 1.775E-03 1.772E-03 1.765E-03 1.739E-03 1.666E-03 1.434E-03
 Th-230  U-234   1.000E+00    7.995E-09 2.398E-08 5.593E-08 1.675E-07 4.846E-07 1.573E-06 4.510E-06 1.296E-05
 Th-230  U-238   1.000E+00    7.555E-15 5.287E-14 2.794E-13 2.496E-12 2.095E-11 2.242E-10 1.922E-09 1.841E-08
 Th-230  DOSE(j):            1.776E-03 1.776E-03 1.775E-03 1.773E-03 1.765E-03 1.740E-03 1.670E-03 1.447E-03
0Th-232  Th-232  1.000E+00    1.330E-02 1.329E-02 1.329E-02 1.327E-02 1.321E-02 1.303E-02 1.250E-02 1.083E-02
0U-234   U-234   1.000E+00    7.437E-04 7.436E-04 7.433E-04 7.422E-04 7.391E-04 7.284E-04 6.988E-04 6.041E-04
 U-234   U-238   1.000E+00    1.054E-09 3.162E-09 7.375E-09 2.209E-08 6.391E-08 2.076E-07 5.955E-07 1.716E-06
 U-234   DOSE(j):            7.437E-04 7.436E-04 7.433E-04 7.422E-04 7.392E-04 7.286E-04 6.994E-04 6.058E-04
0U-238   U-238   1.000E+00    2.140E-03 2.140E-03 2.139E-03 2.136E-03 2.127E-03 2.097E-03 2.013E-03 1.743E-03

 BRF(i) is the branch fraction of the parent nuclide.
1RESRAD, Version 5.91     T½ Limit = 0.5 year        03/08/2000  09:00  Page  22
 Summary : CBRDWCS Cabot Reading WC Slope                        File: CBRDWCS.RAD

                                Individual Nuclide Soil Concentration
                              Parent Nuclide and Branch Fraction Indicated
0Nuclide Parent   BRF(i)                                  S(j,t), pCi/g
   (j)     (i)            t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210  Pb-210  1.000E+00    5.000E+00 4.846E+00 4.552E+00 3.657E+00 1.956E+00 2.189E-01 4.193E-04 1.291E-13
 Pb-210  Ra-226  1.000E+00    0.000E+00 1.530E-01 4.446E-01 1.330E+00 2.991E+00 4.535E+00 4.187E+00 2.678E+00
 Pb-210  Th-230  1.000E+00    0.000E+00 3.331E-05 2.935E-04 3.032E-03 2.248E-02 1.444E-01 5.140E-01 1.388E+00
 Pb-210  U-234   1.000E+00    0.000E+00 1.002E-10 2.662E-09 9.333E-08 2.173E-06 5.229E-05 6.407E-04 6.480E-03
 Pb-210  U-238   1.000E+00    0.000E+00 0.000E+00 5.714E-15 6.717E-13 4.822E-11 4.157E-09 1.679E-07 6.146E-06
 Pb-210  S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Ra-226  Ra-226  1.000E+00    5.000E+00 4.997E+00 4.990E+00 4.968E+00 4.905E+00 4.691E+00 4.129E+00 2.641E+00
 Ra-226  Th-230  1.000E+00    0.000E+00 2.165E-03 6.490E-03 2.157E-02 6.416E-02 2.076E-01 5.722E-01 1.425E+00
 Ra-226  U-234   1.000E+00    0.000E+00 9.746E-09 8.765E-08 9.715E-07 8.682E-06 9.411E-05 7.895E-04 6.881E-03
 Ra-226  U-238   1.000E+00    0.000E+00 8.832E-15 2.480E-13 9.183E-12 2.464E-10 8.927E-09 2.263E-07 6.737E-06
 Ra-226  S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Ra-228  Ra-228  1.000E+00    7.500E+00 6.647E+00 5.221E+00 2.242E+00 2.004E-01 4.274E-05 1.388E-15 0.000E+00
 Ra-228  Th-232  1.000E+00    0.000E+00 8.516E-01 2.275E+00 5.243E+00 7.254E+00 7.348E+00 7.053E+00 6.109E+00
 Ra-228  S(j):               7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0Th-228  Ra-228  1.000E+00    0.000E+00 2.139E+00 4.036E+00 3.060E+00 3.000E-01 6.405E-05 2.080E-15 0.000E+00
 Th-228  Th-228  1.000E+00    7.500E+00 5.219E+00 2.528E+00 1.998E-01 1.419E-04 1.352E-15 0.000E+00 0.000E+00
 Th-228  Th-232  1.000E+00    0.000E+00 1.398E-01 9.319E-01 4.224E+00 7.154E+00 7.348E+00 7.053E+00 6.109E+00
 Th-228  S(j):               7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0Th-230  Th-230  1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.989E+00 4.968E+00 4.894E+00 4.689E+00 4.036E+00
 Th-230  U-234   1.000E+00    0.000E+00 4.500E-05 1.349E-04 4.491E-04 1.342E-03 4.407E-03 1.267E-02 3.645E-02
 Th-230  U-238   1.000E+00    0.000E+00 6.379E-11 5.738E-10 6.367E-09 5.706E-08 6.248E-07 5.393E-06 5.177E-05
 Th-230  S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Th-232  Th-232  1.000E+00    7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0U-234   U-234   1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.897E+00 4.698E+00 4.061E+00
 U-234   U-238   1.000E+00    0.000E+00 1.417E-05 4.250E-05 1.415E-04 4.226E-04 1.389E-03 3.997E-03 1.153E-02
 U-234   S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0U-238   U-238   1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00

 BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time =  249.53 seconds
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CBRDWT

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

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				

D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	7.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	5.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	7.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	5.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	5.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				

R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.900E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	1.027E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	0.000E+00	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

Pb-210	5.000E+00
Ra-226	5.000E+00
Ra-228	7.500E+00
Th-228	7.500E+00
Th-230	5.000E+00
Th-232	7.500E+00
U-234	5.000E+00
U-238	5.000E+00

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.976E+00	3.975E+00	3.974E+00	3.968E+00	3.952E+00	3.895E+00	3.739E+00	3.239E+00
M(t):	1.325E-01	1.325E-01	1.325E-01	1.323E-01	1.317E-01	1.298E-01	1.246E-01	1.080E-01

0Maximum TDOSE(t): 3.976E+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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.759E-04	0.0001	2.423E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.342E-01	0.0337
Ra-226	1.029E+00	0.2587	9.497E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.702E-02	0.0068
Ra-228	9.938E-01	0.2500	9.249E-03	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.165E-02	0.0105
Th-228	1.180E+00	0.2969	4.604E-02	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.905E-02	0.0048
Th-230	3.362E-04	0.0001	3.457E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-02	0.0026
Th-232	5.689E-02	0.0143	2.613E-01	0.0657	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.924E-02	0.0199
U-234	3.301E-05	0.0000	1.400E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.304E-03	0.0013
U-238	1.260E-02	0.0032	1.251E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.041E-03	0.0013
Total	3.273E+00	0.8233	3.810E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-01	0.0809

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-01	0.0345
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.057E+00	0.2658
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.045E+00	0.2628
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.245E+00	0.3132
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.518E-02	0.0114
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.974E-01	0.1000
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	1.934E-02	0.0049
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	3.016E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.976E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.581E-04	0.0001	2.348E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.300E-01	0.0327
Ra-226	1.028E+00	0.2586	1.023E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.110E-02	0.0078
Ra-228	1.217E+00	0.3063	2.133E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.235E-02	0.0107
Th-228	8.214E-01	0.2066	3.204E-02	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.326E-02	0.0033
Th-230	7.816E-04	0.0002	3.457E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-02	0.0026
Th-232	1.917E-01	0.0482	2.631E-01	0.0662	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.430E-02	0.0212
U-234	3.301E-05	0.0000	1.400E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.303E-03	0.0013
U-238	1.260E-02	0.0032	1.251E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.040E-03	0.0013
Total	3.273E+00	0.8233	3.810E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-01	0.0809

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.329E-01	0.0334
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.060E+00	0.2667
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E+00	0.3223
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.667E-01	0.2180
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.563E-02	0.0115
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.392E-01	0.1356
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	1.934E-02	0.0049
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	3.015E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.975E+00	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.243E-04	0.0001	2.205E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.221E-01	0.0307
Ra-226	1.027E+00	0.2584	1.163E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.889E-02	0.0098
Ra-228	1.327E+00	0.3339	3.121E-02	0.0079	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.924E-02	0.0099
Th-228	3.978E-01	0.1001	1.552E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.422E-03	0.0016
Th-230	1.671E-03	0.0004	3.455E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E-02	0.0026
Th-232	5.049E-01	0.1271	2.696E-01	0.0679	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.419E-02	0.0237
U-234	3.802E-05	0.0000	1.399E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.301E-03	0.0013
U-238	1.260E-02	0.0032	1.251E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.038E-03	0.0013
Total	3.271E+00	0.8233	3.808E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.215E-01	0.0809

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+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-01	0.0314
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.067E+00	0.2685
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.397E+00	0.3517
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.197E-01	0.1056
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.653E-02	0.0117
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.688E-01	0.2186
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	1.933E-02	0.0049
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	3.014E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.974E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.212E-04	0.0001	1.772E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.811E-02	0.0247
Ra-226	1.022E+00	0.2576	1.588E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.253E-02	0.0158
Ra-228	7.787E-01	0.1963	2.155E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.023E-02	0.0051
Th-228	3.145E-02	0.0079	1.227E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.077E-04	0.0001
Th-230	4.774E-03	0.0012	3.450E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.045E-02	0.0026
Th-232	1.416E+00	0.3569	2.931E-01	0.0739	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-01	0.0300
U-234	3.817E-05	0.0000	1.397E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.294E-03	0.0013
U-238	1.258E-02	0.0032	1.249E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.031E-03	0.0013
Total	3.267E+00	0.8233	3.802E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.211E-01	0.0809

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.003E-01	0.0253
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.086E+00	0.2738
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.205E-01	0.2068
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.318E-02	0.0084
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.973E-02	0.0125
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.828E+00	0.4608
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	1.930E-02	0.0049
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	3.010E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.968E+00	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.253E-04	0.0001	9.476E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.247E-02	0.0133
Ra-226	1.010E+00	0.2555	2.381E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.068E-01	0.0270
Ra-228	7.377E-02	0.0187	2.089E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.875E-03	0.0005
Th-228	2.232E-05	0.0000	8.707E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.604E-07	0.0000
Th-230	1.354E-02	0.0034	3.437E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-02	0.0028
Th-232	2.144E+00	0.5424	3.125E-01	0.0791	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.372E-01	0.0347
U-234	3.965E-05	0.0000	1.392E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.274E-03	0.0013
U-238	1.253E-02	0.0032	1.244E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.011E-03	0.0013
Total	3.253E+00	0.8233	3.787E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.198E-01	0.0809

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.365E-02	0.0136
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E+00	0.2831

Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.773E-02	0.0197
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.355E-05	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.907E-02	0.0149
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.593E+00	0.6563
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	1.923E-02	0.0049
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	2.998E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.952E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 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.
Pb-210	2.521E-05	0.0000	1.060E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.872E-03	0.0015
Ra-226	9.656E-01	0.2479	3.088E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-01	0.0377
Ra-228	1.574E-05	0.0000	4.459E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.001E-07	0.0000
Th-228	2.128E-16	0.0000	8.299E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.435E-18	0.0000
Th-230	4.306E-02	0.0111	3.395E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.505E-02	0.0039
Th-232	2.186E+00	0.5611	3.101E-01	0.0796	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-01	0.0352
U-234	5.690E-05	0.0000	1.374E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.206E-03	0.0013
U-238	1.235E-02	0.0032	1.226E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.940E-03	0.0013
Total	3.207E+00	0.8233	3.733E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.152E-01	0.0809

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

0 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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.003E-03	0.0015
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E+00	0.2864
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.659E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.245E-16	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.206E-02	0.0236
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E+00	0.6759
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	1.900E-02	0.0049
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	2.955E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.895E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 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.
Pb-210	4.829E-08	0.0000	2.032E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.125E-05	0.0000
Ra-226	8.499E-01	0.2273	2.813E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.346E-01	0.0360
Ra-228	5.113E-16	0.0000	1.448E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-17	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.181E-01	0.0316	3.278E-02	0.0088	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.652E-02	0.0071
Th-232	2.098E+00	0.5611	2.977E-01	0.0796	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.316E-01	0.0352
U-234	1.991E-04	0.0001	1.324E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.031E-03	0.0013
U-238	1.185E-02	0.0032	1.178E-02	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.745E-03	0.0013
Total	3.078E+00	0.8233	3.583E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.025E-01	0.0809

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

0 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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.150E-05	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.874E-01	0.2641
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.388E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.774E-01	0.0474
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.527E+00	0.6759
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	1.847E-02	0.0049
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	2.838E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 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.
Pb-210	1.487E-17	0.0000	6.253E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.463E-15	0.0000
Ra-226	5.437E-01	0.1679	1.799E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.613E-02	0.0266
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.936E-01	0.0907	2.885E-02	0.0089	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.324E-02	0.0164
Th-232	1.817E+00	0.5611	2.579E-01	0.0796	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.140E-01	0.0352
U-234	1.450E-03	0.0004	1.163E-02	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.594E-03	0.0014

U-238	1.027E-02	0.0032	1.023E-02	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.119E-03	0.0013
Total	2.666E+00	0.8233	3.104E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-01	0.0809

0

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

0

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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.540E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.316E-01	0.1950
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.757E-01	0.1160
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.189E+00	0.6759
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	1.767E-02	0.0055
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	2.461E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.239E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.743E-02	2.658E-02	2.497E-02	2.006E-02	1.073E-02	1.201E-03	2.300E-06	7.080E-16
0Ra-226	Ra-226	1.000E+00	2.109E-01	2.108E-01	2.105E-01	2.096E-01	2.069E-01	1.979E-01	1.742E-01	1.114E-01
Ra-226	Pb-210	1.000E+00	0.000E+00	1.267E-03	2.867E-03	7.722E-03	1.683E-02	2.528E-02	2.332E-02	1.492E-02
Ra-226	DSR(j)		2.109E-01	2.120E-01	2.134E-01	2.173E-01	2.237E-01	2.231E-01	1.975E-01	1.263E-01
0Ra-228	Ra-228	1.000E+00	1.087E-01	9.632E-02	7.565E-02	3.249E-02	2.903E-03	6.194E-07	2.012E-17	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	7.450E-02	1.107E-01	7.691E-02	7.461E-03	1.593E-06	5.172E-17	0.000E+00
Ra-228	DSR(j)		1.087E-01	1.708E-01	1.863E-01	1.094E-01	1.036E-02	2.212E-06	7.184E-17	0.000E+00
0Th-228	Th-228	1.000E+00	1.661E-01	1.156E-01	5.597E-02	4.424E-03	3.141E-06	2.993E-17	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	8.991E-03	8.989E-03	8.985E-03	8.972E-03	8.934E-03	8.801E-03	8.432E-03	7.258E-03
Th-230	Ra-226	1.000E+00	0.000E+00	1.370E-04	3.194E-04	9.554E-04	2.752E-03	8.801E-03	2.418E-02	6.015E-02
Th-230	Pb-210	1.000E+00	0.000E+00	4.303E-07	2.228E-06	1.855E-05	1.289E-04	8.101E-04	2.869E-03	7.738E-03
Th-230	DSR(j)		8.991E-03	9.127E-03	9.307E-03	9.946E-03	1.181E-02	1.841E-02	3.548E-02	7.515E-02
0Th-232	Th-232	1.000E+00	4.503E-02	4.502E-02	4.500E-02	4.493E-02	4.475E-02	4.411E-02	4.234E-02	3.668E-02
Th-232	Ra-228	1.000E+00	0.000E+00	1.902E-02	3.964E-02	8.264E-02	1.118E-01	1.130E-01	1.085E-01	9.398E-02
Th-232	Th-228	1.000E+00	0.000E+00	7.851E-03	3.120E-02	1.162E-01	1.893E-01	1.939E-01	1.861E-01	1.612E-01
Th-232	DSR(j)		4.503E-02	7.189E-02	1.158E-01	2.438E-01	3.458E-01	3.511E-01	3.370E-01	2.919E-01
0U-234	U-234	1.000E+00	3.868E-03	3.867E-03	3.866E-03	3.860E-03	3.844E-03	3.788E-03	3.634E-03	3.142E-03
U-234	Th-230	1.000E+00	0.000E+00	1.214E-07	2.831E-07	8.480E-07	2.453E-06	7.964E-06	2.283E-05	6.557E-05
U-234	Ra-226	1.000E+00	0.000E+00	9.593E-10	5.067E-09	4.522E-08	3.786E-07	4.010E-06	3.342E-05	2.906E-04
U-234	Pb-210	1.000E+00	0.000E+00	2.083E-12	2.393E-11	6.010E-10	1.268E-08	2.950E-07	3.583E-06	3.614E-05
U-234	DSR(j)		3.868E-03	3.867E-03	3.866E-03	3.861E-03	3.847E-03	3.801E-03	3.694E-03	3.534E-03
0U-238	U-238	1.000E+00	6.032E-03	6.031E-03	6.028E-03	6.020E-03	5.995E-03	5.909E-03	5.672E-03	4.914E-03
U-238	U-234	1.000E+00	0.000E+00	1.645E-08	3.836E-08	1.149E-07	3.324E-07	1.080E-06	3.097E-06	8.924E-06
U-238	Th-230	1.000E+00	0.000E+00	2.676E-13	1.414E-12	1.263E-11	1.061E-10	1.135E-09	9.730E-09	9.318E-08
U-238	Ra-226	1.000E+00	0.000E+00	1.438E-15	1.697E-14	4.495E-13	1.093E-11	3.823E-10	9.595E-09	2.847E-07
U-238	Pb-210	1.000E+00	0.000E+00	1.540E-18	5.978E-17	4.553E-15	2.864E-13	2.358E-11	9.403E-10	3.430E-08
U-238	DSR(j)		6.032E-03	6.031E-03	6.028E-03	6.020E-03	5.995E-03	5.911E-03	5.675E-03	4.923E-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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	1.094E+03	1.128E+03	1.201E+03	1.495E+03	2.796E+03	2.499E+04	1.304E+07	*7.631E+13
Ra-226	1.420E+02	1.415E+02	1.406E+02	1.381E+02	1.341E+02	1.344E+02	1.519E+02	2.375E+02
Ra-228	2.154E+02	1.756E+02	1.610E+02	2.742E+02	2.895E+03	1.356E+07	*2.726E+14	*2.726E+14
Th-228	1.807E+02	2.596E+02	5.360E+02	6.781E+03	9.552E+06	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	3.320E+03	3.287E+03	3.223E+03	3.016E+03	2.539E+03	1.629E+03	8.455E+02	3.992E+02
Th-232	5.662E+02	4.173E+02	2.590E+02	1.231E+02	8.676E+01	8.545E+01	8.903E+01	1.028E+02
U-234	7.756E+03	7.757E+03	7.760E+03	7.770E+03	7.799E+03	7.893E+03	8.121E+03	8.488E+03
U-238	4.974E+03	4.975E+03	4.977E+03	4.984E+03	5.004E+03	5.076E+03	5.286E+03	6.094E+03

*At specific activity limit

0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	5.000E+00	0.000E+00	2.743E-02	1.094E+03	2.743E-02	1.094E+03
Ra-226	5.000E+00	56.8 ñ 0.1	2.259E-01	1.328E+02	2.113E-01	1.420E+02
Ra-228	7.500E+00	2.708 ñ 0.005	1.866E-01	1.607E+02	1.393E-01	2.154E+02
Th-228	7.500E+00	0.000E+00	1.661E-01	1.807E+02	1.661E-01	1.807E+02
Th-230	5.000E+00	1.000E+03	7.515E-02	3.992E+02	9.037E-03	3.320E+03
Th-232	7.500E+00	53.6 ñ 0.1	3.538E-01	8.479E+01	5.299E-02	5.662E+02
U-234	5.000E+00	0.000E+00	3.868E-03	7.756E+03	3.868E-03	7.756E+03
U-238	5.000E+00	0.000E+00	6.032E-03	4.974E+03	6.032E-03	4.974E+03

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

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 Pb-210   Pb-210   1.000E+00    1.371E-01 1.329E-01 1.249E-01 1.003E-01 5.365E-02 6.003E-03 1.150E-05 3.540E-15
 Pb-210   Ra-226   1.000E+00    2.142E-03 6.336E-03 1.433E-02 3.861E-02 8.415E-02 1.264E-01 1.166E-01 7.460E-02
 Pb-210   Th-230   1.000E+00    3.101E-07 2.151E-06 1.114E-05 9.273E-05 6.443E-04 4.051E-03 1.434E-02 3.869E-02
 Pb-210   U-234    1.000E+00    6.990E-13 1.041E-11 1.197E-10 3.005E-09 6.340E-08 1.475E-06 1.791E-05 1.807E-04
 Pb-210   U-238    1.000E+00    0.000E+00 7.698E-18 2.989E-16 2.277E-14 1.432E-12 1.179E-10 4.702E-09 1.715E-07
 Pb-210   DOSE(j):             1.393E-01 1.393E-01 1.392E-01 1.390E-01 1.384E-01 1.365E-01 1.310E-01 1.135E-01
0Ra-226   Ra-226   1.000E+00    1.055E+00 1.054E+00 1.053E+00 1.048E+00 1.035E+00 9.893E-01 8.708E-01 5.570E-01
 Ra-226   Th-230   1.000E+00    2.284E-04 6.850E-04 1.597E-03 4.777E-03 1.376E-02 4.401E-02 1.209E-01 3.007E-01
 Ra-226   U-234    1.000E+00    6.855E-10 4.797E-09 2.534E-08 2.261E-07 1.893E-06 2.005E-05 1.671E-04 1.453E-03
 Ra-226   U-238    1.000E+00    4.096E-16 7.188E-15 8.485E-14 2.248E-12 5.463E-11 1.911E-09 4.798E-08 1.423E-06
 Ra-226   DOSE(j):             1.055E+00 1.055E+00 1.054E+00 1.053E+00 1.048E+00 1.033E+00 9.918E-01 8.592E-01
0Ra-228   Ra-228   1.000E+00    8.151E-01 7.224E-01 5.674E-01 2.437E-01 2.178E-02 4.645E-06 1.509E-16 0.000E+00
 Ra-228   Th-232   1.000E+00    5.012E-02 1.427E-01 2.973E-01 6.198E-01 8.382E-01 8.477E-01 8.136E-01 7.048E-01
 Ra-228   DOSE(j):             8.652E-01 8.651E-01 8.647E-01 8.635E-01 8.599E-01 8.477E-01 8.136E-01 7.048E-01
0Th-228   Ra-228   1.000E+00    2.296E-01 5.587E-01 8.300E-01 5.768E-01 5.596E-02 1.194E-05 3.879E-16 0.000E+00
 Th-228   Th-228   1.000E+00    1.245E+00 8.667E-01 4.197E-01 3.318E-02 2.355E-05 2.245E-16 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    9.598E-03 5.888E-02 2.340E-01 8.715E-01 1.420E+00 1.454E+00 1.396E+00 1.209E+00
 Th-228   DOSE(j):             1.485E+00 1.484E+00 1.484E+00 1.482E+00 1.475E+00 1.454E+00 1.396E+00 1.209E+00
0Th-230   Th-230   1.000E+00    4.496E-02 4.495E-02 4.493E-02 4.486E-02 4.467E-02 4.400E-02 4.216E-02 3.629E-02
 Th-230   U-234    1.000E+00    2.023E-07 6.069E-07 1.415E-06 4.240E-06 1.227E-05 3.982E-05 1.141E-04 3.279E-04
 Th-230   U-238    1.000E+00    1.912E-13 1.338E-12 7.070E-12 6.316E-11 5.303E-10 5.674E-09 4.865E-08 4.659E-07
 Th-230   DOSE(j):             4.496E-02 4.495E-02 4.493E-02 4.486E-02 4.468E-02 4.404E-02 4.227E-02 3.662E-02
0Th-232   Th-232   1.000E+00    3.377E-01 3.376E-01 3.375E-01 3.370E-01 3.356E-01 3.308E-01 3.176E-01 2.751E-01
0U-234    U-234    1.000E+00    1.934E-02 1.934E-02 1.933E-02 1.930E-02 1.922E-02 1.894E-02 1.817E-02 1.571E-02
 U-234    U-238    1.000E+00    2.741E-08 8.223E-08 1.918E-07 5.745E-07 1.662E-06 5.398E-06 1.549E-05 4.462E-05
 U-234    DOSE(j):             1.934E-02 1.934E-02 1.933E-02 1.930E-02 1.922E-02 1.895E-02 1.819E-02 1.575E-02
0U-238    U-238    1.000E+00    3.016E-02 3.015E-02 3.014E-02 3.010E-02 2.997E-02 2.955E-02 2.836E-02 2.457E-02

 BRF(i) is the branch fraction of the parent nuclide.
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 Summary : CBRDBWT  Cabot Reading BW Top                          File: CBRDBWT.RAD

                          Individual Nuclide Soil Concentration
                        Parent Nuclide and Branch Fraction Indicated
0Nuclide Parent   BRF(i)                                  S(j,t), pCi/g
   (j)    (i)              t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210   Pb-210   1.000E+00    5.000E+00 4.846E+00 4.552E+00 3.657E+00 1.956E+00 2.189E-01 4.193E-04 1.291E-13
 Pb-210   Ra-226   1.000E+00    0.000E+00 1.530E-01 4.446E-01 1.330E+00 2.991E+00 4.535E+00 4.187E+00 2.678E+00
 Pb-210   Th-230   1.000E+00    0.000E+00 3.331E-05 2.935E-04 3.032E-03 2.248E-02 1.444E-01 5.140E-01 1.388E+00
 Pb-210   U-234    1.000E+00    0.000E+00 1.002E-10 2.662E-09 9.333E-08 2.173E-06 5.229E-05 6.407E-04 6.480E-03
 Pb-210   U-238    1.000E+00    0.000E+00 0.000E+00 5.714E-15 6.717E-13 4.822E-11 4.157E-09 1.679E-07 6.146E-06
 Pb-210   S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Ra-226   Ra-226   1.000E+00    5.000E+00 4.997E+00 4.990E+00 4.968E+00 4.905E+00 4.691E+00 4.129E+00 2.641E+00
 Ra-226   Th-230   1.000E+00    0.000E+00 2.165E-03 6.490E-03 2.157E-02 6.416E-02 2.076E-01 5.722E-01 1.425E+00
 Ra-226   U-234    1.000E+00    0.000E+00 9.746E-09 8.765E-08 9.715E-07 8.682E-06 9.411E-05 7.895E-04 6.881E-03
 Ra-226   U-238    1.000E+00    0.000E+00 8.832E-15 2.480E-13 9.183E-12 2.464E-10 8.927E-09 2.263E-07 6.737E-06
 Ra-226   S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Ra-228   Ra-228   1.000E+00    7.500E+00 6.647E+00 5.221E+00 2.242E+00 2.004E-01 4.274E-05 1.388E-15 0.000E+00
 Ra-228   Th-232   1.000E+00    0.000E+00 8.516E-01 2.275E+00 5.243E+00 7.254E+00 7.348E+00 7.053E+00 6.109E+00
 Ra-228   S(j):               7.500E+00 7.498E-00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0Th-228   Ra-228   1.000E+00    0.000E+00 2.139E+00 4.036E+00 3.060E+00 3.000E-01 6.405E-05 2.080E-15 0.000E+00
 Th-228   Th-228   1.000E+00    7.500E+00 5.219E+00 2.528E+00 1.998E-01 1.419E-04 1.352E-15 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    0.000E+00 1.398E-01 9.319E-01 4.224E+00 7.154E+00 7.348E+00 7.053E+00 6.109E+00
 Th-228   S(j):               7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0Th-230   Th-230   1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.989E+00 4.968E+00 4.894E+00 4.689E+00 4.036E+00
 Th-230   U-234    1.000E+00    0.000E+00 4.500E-05 1.349E-04 4.491E-04 1.342E-03 4.407E-03 1.267E-02 3.645E-02
 Th-230   U-238    1.000E+00    0.000E+00 6.379E-11 5.738E-10 6.367E-09 5.706E-08 6.248E-07 5.393E-06 5.177E-05
 Th-230   S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Th-232   Th-232   1.000E+00    7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0U-234    U-234    1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.897E+00 4.698E+00 4.061E+00
 U-234    U-238    1.000E+00    0.000E+00 1.417E-05 4.250E-05 1.415E-04 4.226E-04 1.389E-03 3.997E-03 1.153E-02
 U-234    S(j):               5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0U-238    U-238    1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00

 BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time =  251.28 seconds
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Summary : CBRDTE Cabot Reading TE File: CBRDTE.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	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)

```
D-5    Ra-226+D , crustacea and mollusks                    2.500E+02   2.500E+02   BIOFAC( 2,2)
D-5
D-5    Ra-228+D , fish                                      5.000E+01   5.000E+01   BIOFAC( 3,1)
D-5    Ra-228+D , crustacea and mollusks                    2.500E+02   2.500E+02   BIOFAC( 3,2)
D-5
D-5    Th-228+D , fish                                      1.000E+02   1.000E+02   BIOFAC( 4,1)
D-5    Th-228+D , crustacea and mollusks                    5.000E+02   5.000E+02   BIOFAC( 4,2)
D-5
D-5    Th-230   , fish                                      1.000E+02   1.000E+02   BIOFAC( 5,1)
D-5    Th-230   , crustacea and mollusks                    5.000E+02   5.000E+02   BIOFAC( 5,2)
D-5
D-5    Th-232   , fish                                      1.000E+02   1.000E+02   BIOFAC( 6,1)
D-5    Th-232   , crustacea and mollusks                    5.000E+02   5.000E+02   BIOFAC( 6,2)
D-5
D-5    U-234    , fish                                      1.000E+01   1.000E+01   BIOFAC( 7,1)
D-5    U-234    , crustacea and mollusks                    6.000E+01   6.000E+01   BIOFAC( 7,2)
D-5
D-5    U-238+D  , fish                                      1.000E+01   1.000E+01   BIOFAC( 8,1)
D-5    U-238+D  , crustacea and mollusks                    6.000E+01   6.000E+01   BIOFAC( 8,2)
```


Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.500E+01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.500E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	2.250E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	2.250E+01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.500E+01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	2.250E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	1.500E+01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-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)	8.200E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

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Summary : CBRDTE Cabot Reading TE File: CBRDTE.RAD

Contaminated Zone Dimensions

Area: 10000.00 square meters
Thickness: 2.00 meters
Cover Depth: 0.00 meters

Initial Soil Concentrations, pCi/g

Pb-210	1.500E+01
Ra-226	1.500E+01
Ra-228	2.250E+01
Th-228	2.250E+01
Th-230	1.500E+01
Th-232	2.250E+01
U-234	1.500E+01
U-238	1.500E+01

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	4.386E+00	4.385E+00	4.384E+00	4.377E+00	4.359E+00	4.297E+00	4.125E+00	3.573E+00
M(t):	1.462E-01	1.462E-01	1.461E-01	1.459E-01	1.453E-01	1.432E-01	1.375E-01	1.191E-01

0Maximum TDOSE(t): 4.386E+00 mrem/yr at t = 0.000E+00 years

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Summary : CBRDTE Cabot Reading TE File: CBRDTE.RAD

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
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.260E-04	0.0002	1.161E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.213E-02	0.0073
Ra-226	1.297E+00	0.2957	4.550E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.471E-03	0.0015
Ra-228	1.253E+00	0.2856	4.431E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.976E-03	0.0023
Th-228	1.488E+00	0.3392	2.206E-02	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.564E-03	0.0010
Th-230	4.239E-04	0.0001	1.656E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.461E-03	0.0006
Th-232	7.173E-02	0.0164	1.252E-01	0.0285	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.898E-02	0.0043
U-234	4.792E-05	0.0000	6.706E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-03	0.0003
U-238	1.589E-02	0.0036	5.995E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.208E-03	0.0003
Total	4.127E+00	0.9408	1.825E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.706E-02	0.0176

0

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
0 Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.402E-02	0.0078
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.304E+00	0.2973
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.267E+00	0.2889
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.515E+00	0.3453
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.945E-02	0.0044
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.159E-01	0.0492
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	8.025E-03	0.0018
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	2.309E-02	0.0053
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	4.386E+00	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : CBRDTE Cabot Reading TE File: CBRDTE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.036E-04	0.0002	1.125E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.114E-02	0.0071
Ra-226	1.296E+00	0.2956	4.902E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.450E-03	0.0017
Ra-228	1.535E+00	0.3500	1.022E-02	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.014E-02	0.0023
Th-228	1.036E+00	0.2361	1.535E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.176E-03	0.0007
Th-230	9.854E-04	0.0002	1.656E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.464E-03	0.0006
Th-232	2.417E-01	0.0551	1.261E-01	0.0287	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-02	0.0046
U-234	4.792E-05	0.0000	6.705E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-03	0.0003
U-238	1.589E-02	0.0036	5.994E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.207E-03	0.0003
Total	4.126E+00	0.9408	1.825E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.705E-02	0.0176

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
0 Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.297E-02	0.0075
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.304E+00	0.2974
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.555E+00	0.3546
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.054E+00	0.2404
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.001E-02	0.0046
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.880E-01	0.0885
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	8.023E-03	0.0018
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	2.309E-02	0.0053
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	4.385E+00	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : CBRDTE Cabot Reading TE File: CBRDTE.RAD

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

0 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.
Pb-210	6.610E-04	0.0002	1.057E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.925E-02	0.0067
Ra-226	1.294E+00	0.2953	5.573E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.316E-03	0.0021
Ra-228	1.673E+00	0.3816	1.495E-02	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.400E-03	0.0021
Th-228	5.015E-01	0.1144	7.433E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.538E-03	0.0004
Th-230	2.107E-03	0.0005	1.655E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.470E-03	0.0006
Th-232	6.366E-01	0.1452	1.292E-01	0.0295	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.256E-02	0.0051
U-234	4.793E-05	0.0000	6.703E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-03	0.0003
U-238	1.588E-02	0.0036	5.991E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.207E-03	0.0003
Total	4.124E+00	0.9408	1.824E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.702E-02	0.0176

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

0 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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.097E-02	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.304E+00	0.2976
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.697E+00	0.3872
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.105E-01	0.1165
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.113E-02	0.0048
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.883E-01	0.1798
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	8.020E-03	0.0018
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	2.308E-02	0.0053
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	4.384E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 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.
Pb-210	5.310E-04	0.0001	8.487E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.350E-02	0.0054
Ra-226	1.289E+00	0.2944	7.608E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.498E-02	0.0034
Ra-228	9.817E-01	0.2243	1.032E-02	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.845E-03	0.0011
Th-228	3.965E-02	0.0091	5.876E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.216E-04	0.0000
Th-230	6.018E-03	0.0014	1.653E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-03	0.0006
Th-232	1.786E+00	0.4079	1.404E-01	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.848E-02	0.0065
U-234	4.811E-05	0.0000	6.694E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.268E-03	0.0003
U-238	1.586E-02	0.0036	5.983E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-03	0.0003
Total	4.118E+00	0.9408	1.822E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.691E-02	0.0176

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

0 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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.488E-02	0.0057
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.305E+00	0.2980
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.969E-01	0.2277
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.036E-02	0.0092
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.505E-02	0.0057
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.954E+00	0.4465
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	8.010E-03	0.0018
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	2.305E-02	0.0053
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	4.377E+00	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)

0 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.
Pb-210	2.840E-04	0.0001	4.540E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.257E-02	0.0029
Ra-226	1.273E+00	0.2920	1.141E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.557E-02	0.0059
Ra-228	9.300E-02	0.0213	1.001E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.491E-04	0.0001
Th-228	2.814E-05	0.0000	4.171E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.632E-08	0.0000
Th-230	1.707E-02	0.0039	1.647E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.673E-03	0.0006
Th-232	2.702E+00	0.6199	1.497E-01	0.0343	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.286E-02	0.0075
U-234	4.999E-05	0.0000	6.669E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.263E-03	0.0003
U-238	1.579E-02	0.0036	5.959E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.200E-03	0.0003
Total	4.101E+00	0.9408	1.814E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.659E-02	0.0176

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
0 Water Dependent Pathways

0 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.

Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.331E-02	0.0031
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E+00	0.2981
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.445E-02	0.0217
Th-228	0.000E+00	0.0000	0.000E+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-05	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.621E-02	0.0083
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.885E+00	0.6618
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.982E-03	0.0018
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	2.295E-02	0.0053
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	4.359E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	3.178E-05	0.0000	5.080E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-03	0.0003
Ra-226	1.217E+00	0.2833	1.479E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.522E-02	0.0082
Ra-228	1.985E-05	0.0000	2.136E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.583E-08	0.0000
Th-228	2.682E-16	0.0000	3.976E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.227E-19	0.0000
Th-230	5.428E-02	0.0126	1.626E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.606E-03	0.0008
Th-232	2.756E+00	0.6412	1.486E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.284E-02	0.0076
U-234	7.173E-05	0.0000	6.583E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.247E-03	0.0003
U-238	1.557E-02	0.0036	5.875E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.183E-03	0.0003
Total	4.043E+00	0.9408	1.788E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.550E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.489E-03	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.254E+00	0.2918
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.016E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.730E-16	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.415E-02	0.0173
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E+00	0.6835
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.902E-03	0.0018
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	2.263E-02	0.0053
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	4.297E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	6.088E-08	0.0000	9.732E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.695E-06	0.0000
Ra-226	1.072E+00	0.2598	1.347E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.225E-02	0.0078
Ra-228	6.446E-16	0.0000	6.938E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.112E-18	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.489E-01	0.0361	1.570E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.352E-03	0.0015
Th-232	2.645E+00	0.6412	1.426E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.152E-02	0.0076
U-234	2.510E-04	0.0001	6.343E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-03	0.0003
U-238	1.494E-02	0.0036	5.643E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.137E-03	0.0003
Total	3.880E+00	0.9408	1.716E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.247E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.853E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.105E+00	0.2679
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.547E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.710E-01	0.0414
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.819E+00	0.6835
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.799E-03	0.0019
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	2.172E-02	0.0053
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	4.125E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.874E-17	0.0000	2.996E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.295E-16	0.0000
Ra-226	6.854E-01	0.1918	8.620E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.063E-02	0.0058
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	3.702E-01	0.1036	1.382E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.275E-02	0.0036

Th-232	2.291E+00	0.6412	1.235E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.731E-02	0.0076
U-234	1.828E-03	0.0005	5.570E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.100E-03	0.0003
U-238	1.295E-02	0.0036	4.899E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.867E-04	0.0003
Total	3.362E+00	0.9408	1.487E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.278E-02	0.0176

0

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

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.782E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.069E-01	0.1978
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.968E-01	0.1110
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.442E+00	0.6835
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	8.499E-03	0.0024
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	1.883E-02	0.0053
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.573E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.268E-03	2.198E-03	2.065E-03	1.659E-03	8.872E-04	9.927E-05	1.902E-07	5.854E-17
0Ra-226	Ra-226	1.000E+00	8.689E-02	8.683E-02	8.672E-02	8.633E-02	8.524E-02	8.151E-02	7.175E-02	4.589E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	1.048E-04	2.370E-04	6.305E-04	1.391E-03	2.090E-03	1.928E-03	1.234E-03
Ra-226	DSR(j)		8.689E-02	8.694E-02	8.696E-02	8.697E-02	8.663E-02	8.360E-02	7.367E-02	4.713E-02
0Ra-228	Ra-228	1.000E+00	4.392E-02	3.892E-02	3.057E-02	1.313E-02	1.173E-03	2.503E-07	8.128E-18	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	3.020E-02	4.486E-02	3.118E-02	3.025E-03	6.456E-07	2.097E-17	0.000E+00
Ra-228	DSR(j)		4.392E-02	6.912E-02	7.543E-02	4.431E-02	4.198E-03	8.959E-07	2.910E-17	0.000E+00
0Th-228	Th-228	1.000E+00	6.732E-02	4.685E-02	2.269E-02	1.794E-03	1.273E-06	1.213E-17	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	1.278E-03	1.277E-03	1.277E-03	1.275E-03	1.270E-03	1.251E-03	1.198E-03	1.031E-03
Th-230	Ra-226	1.000E+00	0.000E+00	5.644E-05	1.316E-04	3.936E-04	1.134E-03	3.626E-03	9.961E-03	2.478E-02
Th-230	Pb-210	1.000E+00	0.000E+00	3.558E-08	1.842E-07	1.533E-06	1.065E-05	6.698E-05	2.372E-04	6.398E-04
Th-230	DSR(j)		1.278E-03	1.334E-03	1.409E-03	1.670E-03	2.414E-03	4.943E-03	1.140E-02	2.645E-02
0Th-232	Th-232	1.000E+00	6.376E-03	6.374E-03	6.372E-03	6.363E-03	6.337E-03	6.246E-03	5.995E-03	5.194E-03
Th-232	Ra-228	1.000E+00	0.000E+00	7.686E-03	1.602E-02	3.339E-02	4.516E-02	4.567E-02	4.383E-02	3.797E-02
Th-232	Th-228	1.000E+00	0.000E+00	3.183E-03	1.265E-02	4.711E-02	7.673E-02	7.862E-02	7.546E-02	6.537E-02
Th-232	DSR(j)		6.376E-03	1.724E-02	3.504E-02	8.686E-02	1.282E-01	1.305E-01	1.253E-01	1.085E-01
0U-234	U-234	1.000E+00	5.350E-04	5.349E-04	5.346E-04	5.339E-04	5.316E-04	5.240E-04	5.026E-04	4.346E-04
U-234	Th-230	1.000E+00	0.000E+00	1.725E-08	4.023E-08	1.205E-07	3.486E-07	1.132E-06	3.244E-06	9.319E-06
U-234	Ra-226	1.000E+00	0.000E+00	3.952E-10	2.088E-09	1.863E-08	1.560E-07	1.652E-06	1.377E-05	1.197E-04
U-234	Pb-210	1.000E+00	0.000E+00	1.722E-13	1.979E-12	4.969E-11	1.049E-09	2.439E-08	2.962E-07	2.988E-06
U-234	DSR(j)		5.350E-04	5.349E-04	5.347E-04	5.340E-04	5.321E-04	5.268E-04	5.199E-04	5.666E-04
0U-238	U-238	1.000E+00	1.540E-03	1.539E-03	1.539E-03	1.536E-03	1.530E-03	1.508E-03	1.448E-03	1.254E-03
U-238	U-234	1.000E+00	0.000E+00	2.274E-09	5.305E-09	1.589E-08	4.597E-08	1.493E-07	4.284E-07	1.234E-06
U-238	Th-230	1.000E+00	0.000E+00	3.803E-14	2.009E-13	1.795E-12	1.507E-11	1.613E-10	1.383E-09	1.324E-08
U-238	Ra-226	1.000E+00	0.000E+00	5.923E-16	6.991E-15	1.852E-13	4.501E-12	1.575E-10	3.953E-09	1.173E-07
U-238	Pb-210	1.000E+00	0.000E+00	1.273E-19	4.942E-18	3.765E-16	2.368E-14	1.950E-12	7.775E-11	2.836E-09
U-238	DSR(j)		1.540E-03	1.539E-03	1.539E-03	1.536E-03	1.530E-03	1.508E-03	1.448E-03	1.255E-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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	1.323E+04	1.365E+04	1.453E+04	1.809E+04	3.382E+04	3.022E+05	1.577E+08	*7.631E+13
Ra-226	3.451E+02	3.451E+02	3.450E+02	3.449E+02	3.463E+02	3.588E+02	4.072E+02	6.366E+02
Ra-228	5.326E+02	4.340E+02	3.977E+02	6.771E+02	7.147E+03	3.349E+07	*2.726E+14	*2.726E+14
Th-228	4.457E+02	6.404E+02	1.322E+03	1.673E+04	2.356E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	2.314E+04	2.249E+04	2.130E+04	1.796E+04	1.243E+04	6.069E+03	2.632E+03	1.134E+03
Th-232	3.127E+03	1.740E+03	8.563E+02	3.454E+02	2.340E+02	2.298E+02	2.394E+02	2.764E+02
U-234	5.608E+04	5.609E+04	5.611E+04	5.618E+04	5.638E+04	5.695E+04	5.770E+04	5.295E+04
U-238	1.949E+04	1.949E+04	1.950E+04	1.953E+04	1.961E+04	1.989E+04	2.072E+04	2.390E+04

*At specific activity limit

0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	1.500E+01	0.000E+00	2.268E-03	1.323E+04	2.268E-03	1.323E+04
Ra-226	1.500E+01	7.56 ñ 0.02	8.698E-02	3.449E+02	8.692E-02	3.451E+02
Ra-228	2.250E+01	2.712 ñ 0.005	7.556E-02	3.970E+02	5.633E-02	5.326E+02
Th-228	2.250E+01	0.000E+00	6.732E-02	4.457E+02	6.732E-02	4.457E+02
Th-230	1.500E+01	1.000E+03	2.645E-02	1.134E+03	1.297E-03	2.314E+04
Th-232	2.250E+01	54.2 ñ 0.1	1.315E-01	2.281E+02	9.595E-03	3.127E+03
U-234	1.500E+01	1.000E+03	5.666E-04	5.295E+04	5.350E-04	5.608E+04
U-238	1.500E+01	0.000E+00	1.540E-03	1.949E+04	1.540E-03	1.949E+04

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

0Nuclide Parent BRF(i) DOSE(j,t), mrem/yr

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  (j)      (i)                t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210   Pb-210   1.000E+00    3.402E-02 3.297E-02 3.097E-02 2.488E-02 1.331E-02 1.489E-03 2.853E-06 8.782E-16
 Pb-210   Ra-226   1.000E+00    5.314E-04 1.572E-03 3.555E-03 9.578E-03 2.087E-02 3.136E-02 2.892E-02 1.850E-02
 Pb-210   Th-230   1.000E+00    7.693E-08 5.336E-07 2.763E-06 2.300E-05 1.598E-04 1.005E-03 3.558E-03 9.597E-03
 Pb-210   U-234    1.000E+00    1.734E-13 2.583E-12 2.968E-11 7.453E-10 1.573E-08 3.659E-07 4.444E-06 4.482E-05
 Pb-210   U-238    1.000E+00    0.000E+00 1.910E-18 7.414E-17 5.647E-15 3.552E-13 2.924E-11 1.166E-09 4.254E-08
 Pb-210   DOSE(j):              3.455E-02 3.454E-02 3.453E-02 3.448E-02 3.434E-02 3.385E-02 3.249E-02 2.815E-02
0Ra-226   Ra-226   1.000E+00    1.303E+00 1.302E+00 1.301E+00 1.295E+00 1.279E+00 1.223E+00 1.076E+00 6.884E-01
 Ra-226   Th-230   1.000E+00    2.823E-04 8.466E-04 1.974E-03 5.904E-03 1.700E-02 5.439E-02 1.494E-01 3.717E-01
 Ra-226   U-234    1.000E+00    8.471E-10 5.928E-09 3.131E-08 2.794E-07 2.340E-06 2.478E-05 2.065E-04 1.796E-03
 Ra-226   U-238    1.000E+00    5.062E-16 8.884E-15 1.049E-13 2.778E-12 6.752E-11 2.362E-09 5.929E-08 1.759E-06
 Ra-226   DOSE(j):              1.304E+00 1.303E+00 1.303E+00 1.301E+00 1.296E+00 1.277E+00 1.226E+00 1.062E+00
0Ra-228   Ra-228   1.000E+00    9.881E-01 8.757E-01 6.878E-01 2.954E-01 2.640E-02 5.631E-06 1.829E-16 0.000E+00
 Ra-228   Th-232   1.000E+00    6.075E-02 1.729E-01 3.604E-01 7.513E-01 1.016E+00 1.028E+00 9.863E-01 8.544E-01
 Ra-228   DOSE(j):              1.049E+00 1.049E+00 1.048E+00 1.047E+00 1.042E+00 1.028E+00 9.863E-01 8.544E-01
0Th-228   Ra-228   1.000E+00    2.792E-01 6.795E-01 1.009E+00 7.015E-01 6.805E-02 1.453E-05 4.718E-16 0.000E+00
 Th-228   Th-228   1.000E+00    1.515E+00 1.054E+00 5.105E-01 4.036E-02 2.865E-05 2.730E-16 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    1.167E-02 7.161E-02 2.845E-01 1.060E+00 1.726E+00 1.769E+00 1.698E+00 1.471E+00
 Th-228   DOSE(j):              1.806E+00 1.805E+00 1.804E+00 1.802E+00 1.794E+00 1.769E+00 1.698E+00 1.471E+00
0Th-230   Th-230   1.000E+00    1.917E-02 1.916E-02 1.915E-02 1.912E-02 1.904E-02 1.876E-02 1.797E-02 1.547E-02
 Th-230   U-234    1.000E+00    8.626E-08 2.587E-07 6.034E-07 1.808E-06 5.229E-06 1.698E-05 4.866E-05 1.398E-04
 Th-230   U-238    1.000E+00    8.151E-14 5.705E-13 3.014E-12 2.693E-11 2.261E-10 2.419E-09 2.074E-08 1.986E-07
 Th-230   DOSE(j):              1.917E-02 1.916E-02 1.915E-02 1.913E-02 1.905E-02 1.878E-02 1.802E-02 1.561E-02
0Th-232   Th-232   1.000E+00    1.435E-01 1.434E-01 1.434E-01 1.432E-01 1.426E-01 1.405E-01 1.349E-01 1.169E-01
0U-234    U-234    1.000E+00    8.025E-03 8.023E-03 8.020E-03 8.008E-03 7.975E-03 7.859E-03 7.539E-03 6.518E-03
 U-234    U-238    1.000E+00    1.137E-08 3.412E-08 7.957E-08 2.384E-07 6.896E-07 2.240E-06 6.426E-06 1.851E-05
 U-234    DOSE(j):              8.025E-03 8.023E-03 8.020E-03 8.008E-03 7.975E-03 7.862E-03 7.546E-03 6.537E-03
0U-238    U-238    1.000E+00    2.309E-02 2.309E-02 2.308E-02 2.305E-02 2.295E-02 2.262E-02 2.171E-02 1.881E-02

 BRF(i) is the branch fraction of the parent nuclide.
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 Summary : CBRDTE Cabot Reading TE                                File: CBRDTE.RAD

                                Individual Nuclide Soil Concentration
                              Parent Nuclide and Branch Fraction Indicated
0Nuclide  Parent    BRF(i)                                  S(j,t), pCi/g
  (j)      (i)                t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210   Pb-210   1.000E+00    1.500E+01 1.454E+01 1.366E+01 1.097E+01 5.867E+00 6.566E-01 1.258E-03 3.872E-13
 Pb-210   Ra-226   1.000E+00    0.000E+00 4.589E-01 1.334E+00 3.990E+00 8.973E+00 1.361E+01 1.256E+01 8.035E+00
 Pb-210   Th-230   1.000E+00    0.000E+00 9.992E-05 8.804E-04 9.097E-03 6.743E-02 4.333E-01 1.542E+00 4.164E+00
 Pb-210   U-234    1.000E+00    0.000E+00 3.006E-10 7.987E-09 2.800E-07 6.519E-06 1.569E-04 1.922E-03 1.944E-02
 Pb-210   U-238    1.000E+00    0.000E+00 0.000E+00 1.714E-14 2.015E-12 1.447E-10 1.247E-08 5.036E-07 1.844E-05
 Pb-210   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Ra-226   Ra-226   1.000E+00    1.500E+01 1.499E+01 1.497E+01 1.490E+01 1.472E+01 1.407E+01 1.239E+01 7.923E+00
 Ra-226   Th-230   1.000E+00    0.000E+00 6.495E-03 1.947E-02 6.471E-02 1.925E-01 6.228E-01 1.717E+00 4.275E+00
 Ra-226   U-234    1.000E+00    0.000E+00 2.924E-08 2.630E-07 2.915E-06 2.605E-05 2.823E-04 2.369E-03 2.064E-02
 Ra-226   U-238    1.000E+00    0.000E+00 2.649E-14 7.441E-13 2.755E-11 7.392E-10 2.678E-08 6.789E-07 2.021E-05
 Ra-226   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Ra-228   Ra-228   1.000E+00    2.250E+01 1.994E+01 1.566E+01 6.726E+00 6.011E-01 1.282E-04 4.164E-15 0.000E+00
 Ra-228   Th-232   1.000E+00    0.000E+00 2.555E+00 6.824E+00 1.573E+01 2.176E+01 2.204E+01 2.116E+01 1.833E+01
 Ra-228   S(j):                2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0Th-228   Ra-228   1.000E+00    0.000E+00 6.418E+00 1.211E+01 9.181E+00 9.001E-01 1.922E-04 6.241E-15 0.000E+00
 Th-228   Th-228   1.000E+00    2.250E+01 1.566E+01 7.583E+00 5.995E-01 4.256E-04 4.056E-15 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    0.000E+00 4.194E-01 2.796E+00 1.267E+01 2.146E+01 2.204E+01 2.116E+01 1.833E+01
 Th-228   S(j):                2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0Th-230   Th-230   1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.490E+01 1.468E+01 1.407E+01 1.211E+01
 Th-230   U-234    1.000E+00    0.000E+00 1.350E-04 4.048E-04 1.347E-03 4.025E-03 1.322E-02 3.802E-02 1.093E-01
 Th-230   U-238    1.000E+00    0.000E+00 1.914E-10 1.722E-09 1.910E-08 1.712E-07 1.874E-06 1.618E-05 1.553E-04
 Th-230   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Th-232   Th-232   1.000E+00    2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0U-234    U-234    1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.469E+01 1.409E+01 1.218E+01
 U-234    U-238    1.000E+00    0.000E+00 4.252E-05 1.275E-04 4.244E-04 1.268E-03 4.166E-03 1.199E-02 3.459E-02
 U-234    S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0U-238    U-238    1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01

 BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time =  249.81 seconds
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CBRDWES

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Summary : CBRDWES Cabot Reading WE Slope File: CBRDWES.RAD

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Summary : CBRDWES Cabot Reading WE Slope File: CBRDWES.RAD

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

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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Summary : CBRDWES Cabot Reading WE Slope File: CBRDWES.RAD

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

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)

D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.500E+01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.500E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	2.250E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	2.250E+01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.500E+01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	2.250E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	1.500E+01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-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)	2.280E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

Pb-210	1.500E+01
Ra-226	1.500E+01
Ra-228	2.250E+01
Th-228	2.250E+01
Th-230	1.500E+01
Th-232	2.250E+01
U-234	1.500E+01
U-238	1.500E+01

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.220E+00	1.219E+00	1.219E+00	1.217E+00	1.212E+00	1.195E+00	1.147E+00	9.935E-01
M(t):	4.065E-02	4.064E-02	4.063E-02	4.057E-02	4.040E-02	3.983E-02	3.823E-02	3.312E-02

0Maximum TDOSE(t): 1.220E+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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.019E-04	0.0002	3.227E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.935E-03	0.0073
Ra-226	3.606E-01	0.2957	1.265E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.799E-03	0.0015
Ra-228	3.484E-01	0.2856	1.232E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.774E-03	0.0023
Th-228	4.137E-01	0.3392	6.132E-03	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-03	0.0010
Th-230	1.179E-04	0.0001	4.605E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.844E-04	0.0006
Th-232	1.994E-02	0.0164	3.480E-02	0.0285	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.277E-03	0.0043
U-234	1.333E-05	0.0000	1.865E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.532E-04	0.0003
U-238	4.418E-03	0.0036	1.667E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.358E-04	0.0003
Total	1.147E+00	0.9408	5.075E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.143E-02	0.0176

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.459E-03	0.0078
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.625E-01	0.2973
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.524E-01	0.2889
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.211E-01	0.3453
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.407E-03	0.0044
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.002E-02	0.0492
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	2.231E-03	0.0018
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	6.421E-03	0.0053
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	1.220E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.956E-04	0.0002	3.127E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.659E-03	0.0071
Ra-226	3.604E-01	0.2956	1.363E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.071E-03	0.0017
Ra-228	4.268E-01	0.3500	2.841E-03	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.820E-03	0.0023
Th-228	2.879E-01	0.2361	4.268E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.832E-04	0.0007
Th-230	2.740E-04	0.0002	4.604E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.851E-04	0.0006
Th-232	6.721E-02	0.0551	3.505E-02	0.0287	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.615E-03	0.0046
U-234	1.332E-05	0.0000	1.864E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.532E-04	0.0003
U-238	4.417E-03	0.0036	1.667E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.357E-04	0.0003
Total	1.147E+00	0.9408	5.074E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.142E-02	0.0176

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.168E-03	0.0075
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.626E-01	0.2974
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.324E-01	0.3546
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.931E-01	0.2404
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.563E-03	0.0046
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.079E-01	0.0885
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	2.231E-03	0.0018
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	6.420E-03	0.0053
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	1.219E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.838E-04	0.0002	2.938E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.134E-03	0.0067
Ra-226	3.599E-01	0.2953	1.550E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.590E-03	0.0021
Ra-228	4.651E-01	0.3816	4.157E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.614E-03	0.0021
Th-228	1.394E-01	0.1144	2.067E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.277E-04	0.0004
Th-230	5.859E-04	0.0005	4.602E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.868E-04	0.0006
Th-232	1.770E-01	0.1452	3.592E-02	0.0295	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.273E-03	0.0051
U-234	1.333E-05	0.0000	1.864E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.530E-04	0.0003
U-238	4.416E-03	0.0036	1.666E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.356E-04	0.0003
Total	1.147E+00	0.9408	5.072E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.141E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.612E-03	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.627E-01	0.2976
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.719E-01	0.3872
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-01	0.1165
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.875E-03	0.0048
Th-232	0.000E+00	0.0000	0.000E+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-01	0.1798
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	2.230E-03	0.0018
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	6.417E-03	0.0053
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	1.219E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.476E-04	0.0001	2.360E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.534E-03	0.0054
Ra-226	3.584E-01	0.2944	2.115E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.164E-03	0.0034
Ra-228	2.730E-01	0.2243	2.871E-03	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.347E-03	0.0011
Th-228	1.102E-02	0.0091	1.634E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.381E-05	0.0000
Th-230	1.673E-03	0.0014	4.596E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.961E-04	0.0006
Th-232	4.965E-01	0.4079	3.905E-02	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.920E-03	0.0065
U-234	1.338E-05	0.0000	1.861E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.526E-04	0.0003
U-238	4.409E-03	0.0036	1.664E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.351E-04	0.0003
Total	1.145E+00	0.9408	5.065E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.138E-02	0.0176

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.918E-03	0.0057
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.627E-01	0.2980
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-01	0.2277
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.122E-02	0.0092
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.965E-03	0.0057
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.434E-01	0.4465
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	2.227E-03	0.0018
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	6.408E-03	0.0053
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	1.217E+00	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.896E-05	0.0001	1.262E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.495E-03	0.0029
Ra-226	3.539E-01	0.2920	3.171E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.110E-03	0.0059
Ra-228	2.586E-02	0.0213	2.782E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-04	0.0001
Th-228	7.825E-06	0.0000	1.160E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.400E-08	0.0000
Th-230	4.745E-03	0.0039	4.579E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.432E-04	0.0006
Th-232	7.514E-01	0.6199	4.163E-02	0.0343	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.138E-03	0.0075
U-234	1.390E-05	0.0000	1.854E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.512E-04	0.0003
U-238	4.391E-03	0.0036	1.657E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.337E-04	0.0003
Total	1.140E+00	0.9408	5.044E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.130E-02	0.0176

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.

Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.700E-03	0.0031
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.613E-01	0.2981
Ra-228	0.000E+00	0.0000	0.000E+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-02	0.0217
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.965E-06	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.007E-02	0.0083
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.022E-01	0.6618
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	2.219E-03	0.0018
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	6.382E-03	0.0053
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	1.212E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	8.836E-06	0.0000	1.412E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.911E-04	0.0003
Ra-226	3.385E-01	0.2833	4.114E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.792E-03	0.0082
Ra-228	5.519E-06	0.0000	5.939E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.665E-08	0.0000
Th-228	7.458E-17	0.0000	1.105E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.288E-19	0.0000
Th-230	1.509E-02	0.0126	4.522E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.003E-03	0.0008
Th-232	7.662E-01	0.6412	4.131E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.131E-03	0.0076
U-234	1.994E-05	0.0000	1.830E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.467E-04	0.0003
U-238	4.329E-03	0.0036	1.634E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.290E-04	0.0003
Total	1.124E+00	0.9408	4.972E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.099E-02	0.0176

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

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.140E-04	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.487E-01	0.2918
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.605E-06	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.592E-17	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-02	0.0173
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.166E-01	0.6835
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	2.197E-03	0.0018
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	6.291E-03	0.0053
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	1.195E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	1.693E-08	0.0000	2.706E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.493E-07	0.0000
Ra-226	2.979E-01	0.2598	3.746E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.967E-03	0.0078
Ra-228	1.792E-16	0.0000	1.929E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.654E-19	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	4.140E-02	0.0361	4.366E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.766E-03	0.0015
Th-232	7.354E-01	0.6412	3.965E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.764E-03	0.0076
U-234	6.979E-05	0.0001	1.764E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.350E-04	0.0003
U-238	4.155E-03	0.0036	1.569E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.160E-04	0.0003
Total	1.079E+00	0.9408	4.773E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.015E-02	0.0176

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

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.932E-07	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.073E-01	0.2679
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.753E-02	0.0414
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.838E-01	0.6835
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	2.168E-03	0.0019
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	6.040E-03	0.0053
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	1.147E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	5.211E-18	0.0000	8.330E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.306E-16	0.0000
Ra-226	1.906E-01	0.1918	2.397E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.736E-03	0.0058
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.029E-01	0.1036	3.843E-03	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.546E-03	0.0036

Th-232	6.371E-01	0.6412	3.435E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.592E-03	0.0076
U-234	5.082E-04	0.0005	1.549E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.060E-04	0.0003
U-238	3.600E-03	0.0036	1.362E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.743E-04	0.0003
Total	9.347E-01	0.9408	4.134E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.745E-02	0.0176

0

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

0

0

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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.442E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.966E-01	0.1978
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-01	0.1110
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.790E-01	0.6835
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	2.363E-03	0.0024
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.236E-03	0.0053
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.935E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	6.306E-04	6.112E-04	5.741E-04	4.612E-04	2.467E-04	2.760E-05	5.288E-08	1.628E-17
0Ra-226	Ra-226	1.000E+00	2.416E-02	2.414E-02	2.411E-02	2.401E-02	2.370E-02	2.266E-02	1.995E-02	1.276E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	2.913E-05	6.590E-05	1.775E-04	3.869E-04	5.812E-04	5.362E-04	3.430E-04
Ra-226	DSR(j)		2.416E-02	2.417E-02	2.418E-02	2.418E-02	2.409E-02	2.325E-02	2.048E-02	1.310E-02
0Ra-228	Ra-228	1.000E+00	1.221E-02	1.082E-02	8.500E-03	3.650E-03	3.262E-04	6.959E-08	2.260E-18	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	8.397E-03	1.247E-02	8.669E-03	8.410E-04	1.795E-07	5.830E-18	0.000E+00
Ra-228	DSR(j)		1.221E-02	1.922E-02	2.097E-02	1.232E-02	1.167E-03	2.491E-07	8.090E-18	0.000E+00
0Th-228	Th-228	1.000E+00	1.872E-02	1.303E-02	6.308E-03	4.987E-04	3.540E-07	3.374E-18	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	3.553E-04	3.552E-04	3.550E-04	3.545E-04	3.530E-04	3.477E-04	3.332E-04	2.868E-04
Th-230	Ra-226	1.000E+00	0.000E+00	1.569E-05	3.659E-05	1.094E-04	3.152E-04	1.008E-03	2.770E-03	6.890E-03
Th-230	Pb-210	1.000E+00	0.000E+00	9.892E-09	5.122E-08	4.264E-07	2.963E-06	1.862E-05	6.596E-05	1.779E-04
Th-230	DSR(j)		3.553E-04	3.709E-04	3.917E-04	4.644E-04	6.711E-04	1.374E-03	3.169E-03	7.355E-03
0Th-232	Th-232	1.000E+00	1.773E-03	1.772E-03	1.772E-03	1.769E-03	1.762E-03	1.737E-03	1.667E-03	1.444E-03
Th-232	Ra-228	1.000E+00	0.000E+00	2.137E-03	4.454E-03	9.285E-03	1.256E-02	1.270E-02	1.219E-02	1.056E-02
Th-232	Th-228	1.000E+00	0.000E+00	8.849E-04	3.516E-03	1.310E-02	2.133E-02	2.186E-02	2.098E-02	1.818E-02
Th-232	DSR(j)		1.773E-03	4.794E-03	9.742E-03	2.415E-02	3.565E-02	3.629E-02	3.484E-02	3.018E-02
0U-234	U-234	1.000E+00	1.487E-04	1.487E-04	1.487E-04	1.484E-04	1.478E-04	1.457E-04	1.398E-04	1.208E-04
U-234	Th-230	1.000E+00	0.000E+00	4.796E-09	1.119E-08	3.351E-08	9.692E-08	3.147E-07	9.021E-07	2.591E-06
U-234	Ra-226	1.000E+00	0.000E+00	1.099E-10	5.804E-10	5.180E-09	4.337E-08	4.594E-07	3.828E-06	3.329E-05
U-234	Pb-210	1.000E+00	0.000E+00	4.788E-14	5.502E-13	1.382E-11	2.915E-10	6.782E-09	8.237E-08	8.308E-07
U-234	DSR(j)		1.487E-04	1.487E-04	1.487E-04	1.485E-04	1.480E-04	1.465E-04	1.446E-04	1.575E-04
0U-238	U-238	1.000E+00	4.281E-04	4.280E-04	4.278E-04	4.272E-04	4.254E-04	4.194E-04	4.025E-04	3.487E-04
U-238	U-234	1.000E+00	0.000E+00	6.324E-10	1.475E-09	4.419E-09	1.278E-08	4.151E-08	1.191E-07	3.432E-07
U-238	Th-230	1.000E+00	0.000E+00	1.057E-14	5.587E-14	4.991E-13	4.191E-12	4.484E-11	3.845E-10	3.682E-09
U-238	Ra-226	1.000E+00	0.000E+00	1.647E-16	1.944E-15	5.149E-14	1.252E-12	4.379E-11	1.099E-09	3.261E-08
U-238	Pb-210	1.000E+00	0.000E+00	3.540E-20	1.374E-18	1.047E-16	6.584E-15	5.421E-13	2.162E-11	7.885E-10
U-238	DSR(j)		4.281E-04	4.280E-04	4.278E-04	4.272E-04	4.254E-04	4.194E-04	4.026E-04	3.491E-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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	4.757E+04	4.908E+04	5.225E+04	6.505E+04	1.216E+05	1.087E+06	5.673E+08	*7.631E+13
Ra-226	1.241E+03	1.241E+03	1.241E+03	1.241E+03	1.245E+03	1.291E+03	1.464E+03	2.289E+03
Ra-228	1.916E+03	1.561E+03	1.430E+03	2.435E+03	2.570E+04	1.204E+08	*2.726E+14	*2.726E+14
Th-228	1.603E+03	2.303E+03	4.756E+03	6.016E+04	8.474E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	8.322E+04	8.089E+04	7.660E+04	6.460E+04	4.470E+04	2.183E+04	9.467E+03	4.079E+03
Th-232	1.125E+04	6.257E+03	3.080E+03	1.242E+03	8.415E+02	8.266E+02	8.612E+02	9.941E+02
U-234	2.017E+05	2.017E+05	2.018E+05	2.021E+05	2.028E+05	2.048E+05	2.075E+05	1.904E+05
U-238	7.008E+04	7.010E+04	7.013E+04	7.023E+04	7.051E+04	7.153E+04	7.451E+04	8.594E+04

*At specific activity limit

0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	1.500E+01	0.000E+00	6.306E-04	4.757E+04	6.306E-04	4.757E+04
Ra-226	1.500E+01	7.61 ñ 0.02	2.418E-02	1.240E+03	2.417E-02	1.241E+03
Ra-228	2.250E+01	2.712 ñ 0.005	2.101E-02	1.428E+03	1.566E-02	1.916E+03
Th-228	2.250E+01	0.000E+00	1.872E-02	1.603E+03	1.872E-02	1.603E+03
Th-230	1.500E+01	1.000E+03	7.355E-03	4.079E+03	3.605E-04	8.322E+04
Th-232	2.250E+01	54.2 ñ 0.1	3.657E-02	8.203E+02	2.668E-03	1.125E+04
U-234	1.500E+01	1.000E+03	1.575E-04	1.904E+05	1.487E-04	2.017E+05
U-238	1.500E+01	0.000E+00	4.281E-04	7.008E+04	4.281E-04	7.008E+04

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

0Nuclide Parent BRF(i) DOSE(j,t), mrem/yr

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  (j)      (i)                t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210   Pb-210   1.000E+00    9.459E-03 9.168E-03 8.612E-03 6.918E-03 3.700E-03 4.140E-04 7.932E-07 2.442E-16
 Pb-210   Ra-226   1.000E+00    1.477E-04 4.370E-04 9.886E-04 2.663E-03 5.804E-03 8.718E-03 8.042E-03 5.145E-03
 Pb-210   Th-230   1.000E+00    2.139E-08 1.484E-07 7.683E-07 6.395E-06 4.444E-05 2.794E-04 9.894E-04 2.668E-03
 Pb-210   U-234    1.000E+00    4.821E-14 7.183E-13 8.252E-12 2.072E-10 4.373E-09 1.017E-07 1.236E-06 1.246E-05
 Pb-210   U-238    1.000E+00    0.000E+00 5.309E-19 2.061E-17 1.570E-15 9.876E-14 8.131E-12 3.243E-10 1.183E-08
 Pb-210   DOSE(j):             9.607E-03 9.605E-03 9.601E-03 9.587E-03 9.548E-03 9.412E-03 9.034E-03 7.826E-03
0Ra-226   Ra-226   1.000E+00    3.624E-01 3.621E-01 3.617E-01 3.601E-01 3.555E-01 3.400E-01 2.992E-01 1.914E-01
 Ra-226   Th-230   1.000E+00    7.850E-05 2.354E-04 5.488E-04 1.642E-03 4.728E-03 1.512E-02 4.155E-02 1.033E-01
 Ra-226   U-234    1.000E+00    2.355E-10 1.648E-09 8.707E-09 7.770E-08 6.505E-07 6.890E-06 5.742E-05 4.993E-04
 Ra-226   U-238    1.000E+00    1.407E-16 2.470E-15 2.916E-14 7.724E-13 1.877E-11 6.568E-10 1.649E-08 4.891E-07
 Ra-226   DOSE(j):             3.625E-01 3.624E-01 3.622E-01 3.617E-01 3.602E-01 3.551E-01 3.408E-01 2.953E-01
0Ra-228   Ra-228   1.000E+00    2.747E-01 2.435E-01 1.912E-01 8.213E-02 7.339E-03 1.566E-06 5.085E-17 0.000E+00
 Ra-228   Th-232   1.000E+00    1.689E-02 4.808E-02 1.002E-01 2.089E-01 2.825E-01 2.857E-01 2.742E-01 2.376E-01
 Ra-228   DOSE(j):             2.916E-01 2.916E-01 2.914E-01 2.910E-01 2.898E-01 2.857E-01 2.742E-01 2.376E-01
0Th-228   Ra-228   1.000E+00    7.764E-02 1.889E-01 2.807E-01 1.951E-01 1.892E-02 4.039E-06 1.312E-16 0.000E+00
 Th-228   Th-228   1.000E+00    4.211E-01 2.931E-01 1.419E-01 1.122E-02 7.965E-06 7.592E-17 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    3.246E-03 1.991E-02 7.912E-02 2.947E-01 4.800E-01 4.918E-01 4.721E-01 4.090E-01
 Th-228   DOSE(j):             5.020E-01 5.019E-01 5.017E-01 5.010E-01 4.990E-01 4.918E-01 4.721E-01 4.090E-01
0Th-230   Th-230   1.000E+00    5.329E-03 5.328E-03 5.325E-03 5.317E-03 5.295E-03 5.216E-03 4.997E-03 4.302E-03
 Th-230   U-234    1.000E+00    2.398E-08 7.194E-08 1.678E-07 5.026E-07 1.454E-06 4.720E-06 1.353E-05 3.887E-05
 Th-230   U-238    1.000E+00    2.266E-14 1.586E-13 8.381E-13 7.487E-12 6.286E-11 6.726E-10 5.767E-09 5.523E-08
 Th-230   DOSE(j):             5.329E-03 5.328E-03 5.326E-03 5.318E-03 5.296E-03 5.221E-03 5.011E-03 4.341E-03
0Th-232   Th-232   1.000E+00    3.989E-02 3.988E-02 3.986E-02 3.981E-02 3.964E-02 3.908E-02 3.751E-02 3.249E-02
0U-234    U-234    1.000E+00    2.231E-03 2.231E-03 2.230E-03 2.227E-03 2.217E-03 2.185E-03 2.096E-03 1.812E-03
 U-234    U-238    1.000E+00    3.163E-09 9.486E-09 2.213E-08 6.628E-08 1.917E-07 6.227E-07 1.787E-06 5.148E-06
 U-234    DOSE(j):             2.231E-03 2.231E-03 2.230E-03 2.227E-03 2.218E-03 2.186E-03 2.098E-03 1.818E-03
0U-238    U-238    1.000E+00    6.421E-03 6.420E-03 6.417E-03 6.408E-03 6.382E-03 6.291E-03 6.038E-03 5.230E-03

 BRF(i) is the branch fraction of the parent nuclide.
1RESRAD, Version 5.91     T½ Limit = 0.5 year        03/08/2000  09:37  Page  22
 Summary : CERDWES Cabot Reading WE Slope                        File: CBRDWES.RAD

                                Individual Nuclide Soil Concentration
                              Parent Nuclide and Branch Fraction Indicated
0Nuclide Parent    BRF(i)                                  S(j,t), pCi/g
   (j)     (i)                t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210   Pb-210   1.000E+00    1.500E+01 1.454E+01 1.366E+01 1.097E+01 5.867E+00 6.566E-01 1.258E-03 3.872E-13
 Pb-210   Ra-226   1.000E+00    0.000E+00 4.589E-01 1.334E+00 3.990E+00 8.973E+00 1.361E+01 1.256E+01 8.035E+00
 Pb-210   Th-230   1.000E+00    0.000E+00 9.992E-05 8.804E-04 9.097E-03 6.743E-02 4.333E-01 1.542E+00 4.164E+00
 Pb-210   U-234    1.000E+00    0.000E+00 3.006E-10 7.987E-09 2.800E-07 6.519E-06 1.569E-04 1.922E-03 1.944E-02
 Pb-210   U-238    1.000E+00    0.000E+00 0.000E+00 1.714E-14 2.015E-12 1.447E-10 1.247E-08 5.036E-07 1.844E-05
 Pb-210   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Ra-226   Ra-226   1.000E+00    1.500E+01 1.499E+01 1.497E+01 1.490E+01 1.472E+01 1.407E+01 1.239E+01 7.923E+00
 Ra-226   Th-230   1.000E+00    0.000E+00 6.495E-03 1.947E-02 6.471E-02 1.925E-01 6.228E-01 1.717E+00 4.275E+00
 Ra-226   U-234    1.000E+00    0.000E+00 2.924E-08 2.630E-07 2.915E-06 2.605E-05 2.823E-04 2.369E-03 2.064E-02
 Ra-226   U-238    1.000E+00    0.000E+00 2.649E-14 7.441E-13 2.755E-11 7.392E-10 2.678E-08 6.789E-07 2.021E-05
 Ra-226   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Ra-228   Ra-228   1.000E+00    2.250E+01 1.994E+01 1.566E+01 6.726E+00 6.011E-01 1.282E-04 4.164E-15 0.000E+00
 Ra-228   Th-232   1.000E+00    0.000E+00 2.555E+00 6.824E+00 1.573E+01 2.176E+01 2.204E+01 2.116E+01 1.833E+01
 Ra-228   S(j):                2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0Th-228   Ra-228   1.000E+00    0.000E+00 6.418E+00 1.211E+01 9.181E+00 9.001E-01 1.922E-04 6.241E-15 0.000E+00
 Th-228   Th-228   1.000E+00    2.250E+01 1.566E+01 7.583E+00 5.995E-01 4.256E-04 4.056E-15 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    0.000E+00 4.194E-01 2.796E+00 1.267E+01 2.146E+01 2.204E+01 2.116E+01 1.833E+01
 Th-228   S(j):                2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0Th-230   Th-230   1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.490E+01 1.468E+01 1.407E+01 1.211E+01
 Th-230   U-234    1.000E+00    0.000E+00 1.350E-04 4.048E-04 1.347E-03 4.025E-03 1.322E-02 3.802E-02 1.093E-01
 Th-230   U-238    1.000E+00    0.000E+00 1.914E-10 1.722E-09 1.910E-08 1.712E-07 1.874E-06 1.618E-05 1.553E-04
 Th-230   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Th-232   Th-232   1.000E+00    2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0U-234    U-234    1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.469E+01 1.409E+01 1.218E+01
 U-234    U-238    1.000E+00    0.000E+00 4.252E-05 1.275E-04 4.244E-04 1.268E-03 4.166E-03 1.199E-02 3.459E-02
 U-234    S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0U-238    U-238    1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01

 BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time =  250.74 seconds
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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	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)

```
D-5
D-5    Ra-226+D , fish                                    5.000E+01   5.000E+01   BIOFAC( 2,1)
D-5    Ra-226+D , crustacea and mollusks                  2.500E+02   2.500E+02   BIOFAC( 2,2)
D-5
D-5    Ra-228+D , fish                                    5.000E+01   5.000E+01   BIOFAC( 3,1)
D-5    Ra-228+D , crustacea and mollusks                  2.500E+02   2.500E+02   BIOFAC( 3,2)
D-5
D-5    Th-228+D , fish                                    1.000E+02   1.000E+02   BIOFAC( 4,1)
D-5    Th-228+D , crustacea and mollusks                  5.000E+02   5.000E+02   BIOFAC( 4,2)
D-5
D-5    Th-230   , fish                                    1.000E+02   1.000E+02   BIOFAC( 5,1)
D-5    Th-230   , crustacea and mollusks                  5.000E+02   5.000E+02   BIOFAC( 5,2)
D-5
D-5    Th-232   , fish                                    1.000E+02   1.000E+02   BIOFAC( 6,1)
D-5    Th-232   , crustacea and mollusks                  5.000E+02   5.000E+02   BIOFAC( 6,2)
D-5
D-5    U-234    , fish                                    1.000E+01   1.000E+01   BIOFAC( 7,1)
D-5    U-234    , crustacea and mollusks                  6.000E+01   6.000E+01   BIOFAC( 7,2)
D-5
D-5    U-238+D  , fish                                    1.000E+01   1.000E+01   BIOFAC( 8,1)
D-5    U-238+D  , crustacea and mollusks                  6.000E+01   6.000E+01   BIOFAC( 8,2)
```


Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.400E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.000E+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)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	7.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	5.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	7.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	5.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	5.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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 Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.661E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.798E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.798E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.444E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.444E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.444E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.311E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E-00	0.000E+00	5.311E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	0.000E+00	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	0.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.900E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)

R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	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)	3.650E+01	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
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)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

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Summary : RDRWWLK--Reading Right-of-Way Walker File: RDRWWLK.RAD

Contaminated Zone Dimensions

Area: 1400.00 square meters
Thickness: 1.00 meters
Cover Depth: 0.00 meters

Initial Soil Concentrations, pCi/g

Pb-210	5.000E+00
Ra-226	5.000E+00
Ra-228	7.500E+00
Th-228	7.500E+00
Th-230	5.000E+00
Th-232	7.500E+00
U-234	5.000E+00
U-238	5.000E+00

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 25 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.224E-01	3.217E-01	3.200E-01	3.147E-01	3.055E-01	2.846E-01	2.503E-01	2.255E-01
M(t):	1.290E-02	1.287E-02	1.280E-02	1.259E-02	1.222E-02	1.138E-02	1.001E-02	9.019E-03

0Maximum TDOSE(t): 3.224E-01 mrem/yr at t = 0.000E+00 years
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Summary : RDRWWLK--Reading Right-of-Way Walker File: RDRWWLK.RAD

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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.321E-05	0.0002	7.304E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.479E-03	0.0077
Ra-226	9.575E-02	0.2970	2.862E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.989E-04	0.0015
Ra-228	9.246E-02	0.2868	2.789E-04	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.692E-04	0.0024
Th-228	1.102E-01	0.3418	1.390E-03	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.525E-04	0.0011
Th-230	3.139E-05	0.0001	1.044E-03	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.901E-04	0.0006
Th-232	5.295E-03	0.0164	7.888E-03	0.0245	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.466E-03	0.0045
U-234	3.553E-06	0.0000	4.215E-04	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.787E-05	0.0003
U-238	1.172E-03	0.0036	3.768E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.303E-05	0.0003
Total	3.050E-01	0.9459	1.150E-02	0.0357	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.946E-03	0.0184

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.605E-03	0.0081
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.628E-02	0.2986
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.351E-02	0.2900
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.120E-01	0.3472
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.265E-03	0.0039
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.465E-02	0.0454
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	5.229E-04	0.0016
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	1.642E-03	0.0051
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.224E-01	1.0000

0*Sum of all water independent and dependent pathways.
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Summary : RDRWWLK--Reading Right-of-Way Walker File: RDRWWLK.RAD

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.144E-05	0.0002	7.062E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.397E-03	0.0075
Ra-226	9.535E-02	0.2964	3.072E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.724E-04	0.0018
Ra-228	1.130E-01	0.3514	6.420E-04	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.796E-04	0.0024
Th-228	7.672E-02	0.2385	9.674E-04	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.454E-04	0.0008
Th-230	7.279E-05	0.0002	1.044E-03	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.904E-04	0.0006
Th-232	1.783E-02	0.0554	7.946E-03	0.0247	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-03	0.0048
U-234	3.535E-06	0.0000	4.193E-04	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.735E-05	0.0003
U-238	1.166E-03	0.0036	3.748E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.254E-05	0.0003
Total	3.042E-01	0.9458	1.149E-02	0.0357	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.934E-03	0.0184

0

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

0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.519E-03	0.0078
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.595E-02	0.2983
Ra-228	0.000E+00	0.0000	0.000E+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-01	0.3558
Th-228	0.000E-00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.793E-02	0.2423
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-03	0.0041
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.733E-02	0.0850
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	5.202E-04	0.0016
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	1.633E-03	0.0051
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-01	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : RDRWWLK--Reading Right-of-Way Walker File: RDRWWLK.RAD

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

0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.808E-05	0.0002	6.601E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.240E-03	0.0070
Ra-226	9.455E-02	0.2955	3.469E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.110E-04	0.0022
Ra-228	1.226E-01	0.3833	9.356E-04	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.183E-04	0.0022
Th-228	3.717E-02	0.1162	4.687E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-04	0.0004
Th-230	1.550E-04	0.0005	1.044E-03	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.909E-04	0.0006
Th-232	4.685E-02	0.1464	8.144E-03	0.0255	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-03	0.0054
U-234	3.500E-06	0.0000	4.149E-04	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.633E-05	0.0003
U-238	1.154E-03	0.0036	3.708E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.156E-05	0.0003
Total	3.026E-01	0.9457	1.148E-02	0.0359	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.909E-03	0.0185

0

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

0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.354E-03	0.0074
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.529E-02	0.2978
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.243E-01	0.3885
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.776E-02	0.1180
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.390E-03	0.0043
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.674E-02	0.1773
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	5.147E-04	0.0016
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	1.616E-03	0.0051
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.200E-01	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : RDRWWLK--Reading Right-of-Way Walker File: RDRWWLK.RAD

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

0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	3.797E-05	0.0001	5.212E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.769E-03	0.0056
Ra-226	9.180E-02	0.2917	4.627E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.118E-03	0.0036
Ra-228	7.058E-02	0.2243	6.342E-04	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.623E-04	0.0012
Th-228	2.943E-03	0.0094	3.711E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.412E-06	0.0000
Th-230	4.375E-04	0.0014	1.044E-03	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.937E-04	0.0006
Th-232	1.305E-01	0.4147	8.855E-03	0.0281	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.193E-03	0.0070
U-234	3.390E-06	0.0000	3.998E-04	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.282E-05	0.0003
U-238	1.111E-03	0.0035	3.573E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.822E-05	0.0003
Total	2.974E-01	0.9452	1.143E-02	0.0363	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.826E-03	0.0185

0

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

0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.859E-03	0.0059
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.296E-02	0.2954
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.157E-02	0.2275
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.989E-03	0.0095
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.675E-03	0.0053
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.416E-01	0.4499
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.960E-04	0.0016
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	1.557E-03	0.0049
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.147E-01	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : RDRWWLK--Reading Right-of-Way Walker File: RDRWWLK.RAD

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)

0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.933E-05	0.0001	2.654E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.007E-04	0.0029

Ra-226	8.437E-02	0.2762	6.501E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.790E-03	0.0059
Ra-228	6.239E-03	0.0204	5.740E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.131E-05	0.0001
Th-228	2.097E-06	0.0000	2.645E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.708E-09	0.0000
Th-230	1.200E-03	0.0039	1.044E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.067E-04	0.0007
Th-232	1.957E-01	0.6407	9.449E-03	0.0309	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.523E-03	0.0083
U-234	3.190E-06	0.0000	3.597E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.350E-05	0.0003
U-238	9.995E-04	0.0033	3.213E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.933E-05	0.0003
Total	2.885E-01	0.9446	1.132E-02	0.0371	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.615E-03	0.0184

0

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

0 Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.466E-04	0.0031
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.622E-02	0.2822
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.328E-03	0.0207
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.130E-06	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.451E-03	0.0080
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.077E-01	0.6799
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.463E-04	0.0015
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	1.400E-03	0.0046
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.055E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.822E-06	0.0000	2.501E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.487E-05	0.0003
Ra-226	6.275E-02	0.2205	6.649E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.947E-03	0.0068
Ra-228	1.036E-06	0.0000	9.529E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.196E-09	0.0000
Th-228	2.027E-17	0.0000	2.556E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.484E-20	0.0000
Th-230	3.412E-03	0.0120	1.045E-03	0.0037	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.673E-04	0.0009
Th-232	2.017E-01	0.7087	9.502E-03	0.0334	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.552E-03	0.0090
U-234	3.478E-06	0.0000	2.485E-04	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.769E-05	0.0002
U-238	6.892E-04	0.0024	2.216E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.471E-05	0.0002
Total	2.685E-01	0.9436	1.109E-02	0.0390	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.964E-03	0.0174

0

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

0 Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.919E-05	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.476E-02	0.2276
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.050E-06	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.059E-17	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.725E-03	0.0166
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.138E-01	0.7510
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	3.096E-04	0.0011
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	9.655E-04	0.0034
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.846E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.136E-09	0.0000	2.932E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.950E-08	0.0000
Ra-226	2.692E-02	0.1075	2.965E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.737E-04	0.0035
Ra-228	1.639E-17	0.0000	1.508E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.226E-20	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	7.066E-03	0.0282	1.046E-03	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.843E-04	0.0015
Th-232	2.015E-01	0.8050	9.493E-03	0.0379	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.550E-03	0.0102
U-234	7.638E-06	0.0000	8.701E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.031E-05	0.0001
U-238	2.382E-04	0.0010	7.666E-05	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.893E-05	0.0001
Total	2.358E-01	0.9418	1.073E-02	0.0429	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.847E-03	0.0154

0

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

0 Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.046E-07	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.783E-02	0.1112
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.663E-17	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.497E-03	0.0339
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.136E-01	0.8531
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	1.150E-04	0.0005
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	3.338E-04	0.0013

Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.178E-19	0.0000	1.617E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.489E-18	0.0000
Ra-226	1.392E-03	0.0062	1.534E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.519E-05	0.0002
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	9.596E-03	0.0426	1.039E-03	0.0046	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.650E-04	0.0021
Th-232	2.009E-01	0.8910	9.464E-03	0.0420	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.542E-03	0.0113
U-234	1.569E-05	0.0001	3.831E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E-06	0.0000
U-238	5.795E-06	0.0000	1.867E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.610E-07	0.0000
Total	2.119E-01	0.9398	1.051E-02	0.0466	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.054E-03	0.0135

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.768E-18	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.439E-03	0.0064
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.110E-02	0.0492
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.129E-01	0.9443
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	2.077E-05	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	8.123E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.255E-01	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.210E-04	5.037E-04	4.709E-04	3.718E-04	1.893E-04	1.784E-05	2.091E-08	1.154E-18
0Ra-226	Ra-226	1.000E+00	1.925E-02	1.917E-02	1.900E-02	1.845E-02	1.695E-02	1.261E-02	5.409E-03	2.797E-04
Ra-226	Pb-210	1.000E+00	0.000E+00	2.399E-05	5.394E-05	1.422E-04	2.911E-04	3.460E-04	1.565E-04	8.093E-06
Ra-226	DSR(j)		1.925E-02	1.919E-02	1.906E-02	1.859E-02	1.724E-02	1.295E-02	5.565E-03	2.878E-04
0Ra-228	Ra-228	1.000E+00	9.719E-03	8.583E-03	6.693E-03	2.803E-03	2.331E-04	3.867E-08	6.122E-19	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	6.678E-03	9.880E-03	6.740E-03	6.106E-04	1.014E-07	1.605E-18	0.000E+00
Ra-228	DSR(j)		9.719E-03	1.526E-02	1.657E-02	9.543E-03	8.437E-04	1.400E-07	2.217E-18	0.000E+00
0Th-228	Th-228	1.000E+00	1.493E-02	1.039E-02	5.034E-03	3.985E-04	2.841E-07	2.746E-18	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	2.489E-04	2.489E-04	2.489E-04	2.488E-04	2.488E-04	2.485E-04	2.479E-04	2.456E-04
Th-230	Ra-226	1.000E+00	0.000E+00	1.249E-05	2.903E-05	8.581E-05	2.390E-04	6.836E-04	1.418E-03	1.926E-03
Th-230	Pb-210	1.000E+00	0.000E+00	8.157E-09	4.208E-08	3.456E-07	2.313E-06	1.286E-05	3.388E-05	4.865E-05
Th-230	DSR(j)		2.489E-04	2.614E-04	2.779E-04	3.350E-04	4.901E-04	9.450E-04	1.699E-03	2.220E-03
0Th-232	Th-232	1.000E+00	1.240E-03	1.240E-03	1.240E-03	1.240E-03	1.240E-03	1.240E-03	1.239E-03	1.235E-03
Th-232	Ra-228	1.000E+00	0.000E+00	1.700E-03	3.532E-03	7.303E-03	9.793E-03	1.002E-02	1.001E-02	9.976E-03
Th-232	Th-228	1.000E+00	0.000E+00	7.045E-04	2.793E-03	1.033E-02	1.666E-02	1.724E-02	1.723E-02	1.718E-02
Th-232	DSR(j)		1.240E-03	3.644E-03	7.565E-03	1.887E-02	2.769E-02	2.850E-02	2.848E-02	2.839E-02
0U-234	U-234	1.000E+00	1.046E-04	1.040E-04	1.029E-04	9.917E-05	8.917E-05	6.147E-05	2.124E-05	5.149E-07
U-234	Th-230	1.000E+00	0.000E+00	3.347E-09	7.768E-09	2.288E-08	6.307E-08	1.743E-07	3.354E-07	4.150E-07
U-234	Ra-226	1.000E+00	0.000E+00	8.731E-11	4.586E-10	4.013E-09	3.177E-08	2.776E-07	1.387E-06	3.145E-06
U-234	Pb-210	1.000E+00	0.000E+00	3.943E-14	4.507E-13	1.110E-11	2.218E-10	4.267E-09	3.092E-08	7.905E-08
U-234	DSR(j)		1.046E-04	1.040E-04	1.029E-04	9.920E-05	8.927E-05	6.193E-05	2.299E-05	4.154E-06
0U-238	U-238	1.000E+00	3.284E-04	3.266E-04	3.232E-04	3.114E-04	2.800E-04	1.931E-04	6.675E-05	1.621E-06
U-238	U-234	1.000E+00	0.000E+00	4.422E-10	1.021E-09	2.952E-09	7.711E-09	1.752E-08	1.810E-08	1.462E-09
U-238	Th-230	1.000E+00	0.000E+00	7.368E-15	3.868E-14	3.376E-13	2.653E-12	2.264E-11	1.065E-10	2.162E-10
U-238	Ra-226	1.000E+00	0.000E+00	1.325E-16	1.534E-15	3.966E-14	9.009E-13	2.495E-11	3.305E-10	1.536E-09
U-238	Pb-210	1.000E+00	0.000E+00	4.629E-20	1.145E-18	8.373E-17	4.936E-15	3.239E-13	6.842E-12	3.825E-11
U-238	DSR(j)		3.284E-04	3.266E-04	3.232E-04	3.114E-04	2.800E-04	1.931E-04	6.676E-05	1.625E-06

*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 = 25 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	4.798E+04	4.963E+04	5.310E+04	6.724E+04	1.320E+05	1.401E+06	1.195E+09	*7.631E+13
Ra-226	1.298E+03	1.303E+03	1.312E+03	1.345E+03	1.450E+03	1.930E+03	4.492E+03	8.686E+04
Ra-228	2.005E+03	1.638E+03	1.509E+03	2.620E+03	2.963E+04	1.785E+08	*2.726E+14	*2.726E+14
Th-228	1.675E+03	2.406E+03	4.966E+03	6.273E+04	8.801E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	9.879E+04	9.565E+04	8.995E+04	7.463E+04	5.101E+04	2.646E+04	1.471E+04	1.126E+04
Th-232	1.280E+04	6.860E+03	3.305E+03	1.325E+03	9.028E+02	8.772E+02	8.779E+02	8.807E+02
U-234	2.390E+05	2.403E+05	2.429E+05	2.520E+05	2.801E+05	4.037E+05	1.087E+06	6.018E+06
U-238	7.613E+04	7.654E+04	7.735E+04	8.028E+04	8.928E+04	1.295E+05	*3.360E+05	*3.360E+05

*At specific activity limit

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)

Pb-210	5.000E+00	0.000E+00	5.210E-04	4.798E+04	5.210E-04	4.798E+04
Ra-226	5.000E+00	0.000E+00	1.926E-02	1.298E+03	1.926E-02	1.298E+03
Ra-228	7.500E+00	2.659 ñ 0.005	1.661E-02	1.505E+03	1.247E-02	2.005E+03
Th-228	7.500E+00	0.000E+00	1.493E-02	1.675E+03	1.493E-02	1.675E+03
Th-230	5.000E+00	1.000E+03	2.220E-03	1.126E+04	2.531E-04	9.879E+04
Th-232	7.500E+00	84.2 ñ 0.2	2.850E-02	8.771E+02	1.953E-03	1.280E+04
U-234	5.000E+00	0.000E+00	1.046E-04	2.390E+05	1.046E-04	2.390E+05
U-238	5.000E+00	0.000E+00	3.284E-04	7.613E+04	3.284E-04	7.613E+04

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.605E-03	2.519E-03	2.354E-03	1.859E-03	9.466E-04	8.919E-05	1.046E-07	5.768E-18
Pb-210	Ra-226	1.000E+00	4.066E-05	1.199E-04	2.697E-04	7.111E-04	1.455E-03	1.730E-03	7.823E-04	4.047E-05
Pb-210	Th-230	1.000E+00	5.890E-09	4.078E-08	2.104E-07	1.728E-06	1.156E-05	6.430E-05	1.694E-04	2.432E-04
Pb-210	U-234	1.000E+00	1.327E-14	1.972E-13	2.253E-12	5.552E-11	1.109E-09	2.133E-08	1.546E-07	3.953E-07
Pb-210	U-238	1.000E+00	7.606E-21	2.315E-19	5.723E-18	4.187E-16	2.468E-14	1.620E-12	3.421E-11	1.912E-10
Pb-210	DOSE(j):		2.646E-03	2.639E-03	2.624E-03	2.572E-03	2.414E-03	1.883E-03	9.519E-04	2.841E-04
0Ra-226	Ra-226	1.000E+00	9.624E-02	9.583E-02	9.502E-02	9.225E-02	8.477E-02	6.304E-02	2.704E-02	1.399E-03
Ra-226	Th-230	1.000E+00	2.086E-05	6.246E-05	1.451E-04	4.291E-04	1.195E-03	3.418E-03	7.088E-03	9.629E-03
Ra-226	U-234	1.000E+00	6.253E-11	4.365E-10	2.293E-09	2.007E-08	1.588E-07	1.388E-06	6.934E-06	1.573E-05
Ra-226	U-238	1.000E+00	4.429E-17	6.623E-16	7.672E-15	1.983E-13	4.505E-12	1.248E-10	1.653E-09	7.681E-09
Ra-226	DOSE(j):		9.626E-02	9.589E-02	9.517E-02	9.268E-02	8.596E-02	6.645E-02	3.414E-02	1.104E-02
0Ra-228	Ra-228	1.000E+00	7.289E-02	6.437E-02	5.020E-02	2.102E-02	1.748E-03	2.900E-07	4.591E-18	0.000E+00
Ra-228	Th-232	1.000E+00	4.485E-03	1.275E-02	2.649E-02	5.477E-02	7.345E-02	7.512E-02	7.505E-02	7.482E-02
Ra-228	DOSE(j):		7.738E-02	7.712E-02	7.668E-02	7.579E-02	7.520E-02	7.512E-02	7.505E-02	7.482E-02
0Th-228	Ra-228	1.000E+00	2.062E-02	5.008E-02	7.410E-02	5.055E-02	4.580E-03	7.603E-07	1.204E-17	0.000E+00
Th-228	Th-228	1.000E+00	1.120E-01	7.793E-02	3.776E-02	2.989E-03	2.130E-06	2.059E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	8.621E-04	5.284E-03	2.095E-02	7.748E-02	1.249E-01	1.293E-01	1.292E-01	1.288E-01
Th-228	DOSE(j):		1.334E-01	1.333E-01	1.328E-01	1.310E-01	1.295E-01	1.293E-01	1.292E-01	1.288E-01
0Th-230	Th-230	1.000E+00	1.244E-03	1.244E-03	1.244E-03	1.244E-03	1.244E-03	1.243E-03	1.239E-03	1.228E-03
Th-230	U-234	1.000E+00	5.591E-09	1.673E-08	3.884E-08	1.144E-07	3.153E-07	8.716E-07	1.677E-06	2.075E-06
Th-230	U-238	1.000E+00	5.279E-15	3.684E-14	1.934E-13	1.688E-12	1.327E-11	1.132E-10	5.323E-10	1.081E-09
Th-230	DOSE(j):		1.244E-03	1.244E-03	1.244E-03	1.244E-03	1.244E-03	1.244E-03	1.241E-03	1.230E-03
0Th-232	Th-232	1.000E+00	9.303E-03	9.303E-03	9.303E-03	9.302E-03	9.302E-03	9.299E-03	9.290E-03	9.262E-03
0U-234	U-234	1.000E+00	5.229E-04	5.201E-04	5.146E-04	4.959E-04	4.459E-04	3.074E-04	1.062E-04	2.574E-06
U-234	U-238	1.000E+00	7.406E-10	2.211E-09	5.106E-09	1.476E-08	3.855E-08	8.759E-08	9.051E-08	7.312E-09
U-234	DOSE(j):		5.229E-04	5.202E-04	5.147E-04	4.959E-04	4.459E-04	3.075E-04	1.063E-04	2.582E-06
0U-238	U-238	1.000E+00	1.642E-03	1.633E-03	1.616E-03	1.557E-03	1.400E-03	9.654E-04	3.337E-04	8.106E-06

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.000E+00	4.834E+00	4.519E+00	3.568E+00	1.817E+00	1.712E-01	2.007E-04	1.107E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	1.525E-01	4.406E-01	1.290E+00	2.725E+00	3.269E+00	1.480E+00	7.653E-02
Pb-210	Th-230	1.000E+00	0.000E+00	3.324E-05	2.918E-04	2.974E-03	2.123E-02	1.207E-01	3.194E-01	4.591E-01
Pb-210	U-234	1.000E+00	0.000E+00	9.993E-11	2.641E-09	9.081E-08	2.002E-06	3.982E-05	2.911E-04	7.459E-04
Pb-210	U-238	1.000E+00	0.000E+00	7.121E-17	5.633E-15	6.504E-13	4.378E-11	3.008E-09	6.433E-08	3.608E-07
Pb-210	S(j):		5.000E+00	4.987E+00	4.959E+00	4.861E+00	4.563E+00	3.561E+00	1.799E+00	5.363E-01
0Ra-226	Ra-226	1.000E+00	5.000E+00	4.979E+00	4.937E+00	4.793E+00	4.404E+00	3.275E+00	1.405E+00	7.267E-02
Ra-226	Th-230	1.000E+00	0.000E+00	2.161E-03	6.457E-03	2.121E-02	6.101E-02	1.765E-01	3.672E-01	4.992E-01
Ra-226	U-234	1.000E+00	0.000E+00	9.718E-09	8.691E-08	9.444E-07	7.979E-06	7.137E-05	3.588E-04	8.152E-04
Ra-226	U-238	1.000E+00	0.000E+00	9.179E-15	2.460E-13	8.877E-12	2.226E-10	6.384E-09	8.540E-08	3.981E-07
Ra-226	S(j):		5.000E+00	4.981E+00	4.943E+00	4.814E+00	4.465E+00	3.452E+00	1.773E+00	5.727E-01
0Ra-228	Ra-228	1.000E+00	7.500E+00	6.623E+00	5.165E+00	2.163E+00	1.799E-01	2.984E-05	4.724E-16	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	8.502E-01	2.264E+00	5.174E+00	7.096E+00	7.268E+00	7.261E+00	7.239E+00
Ra-228	S(j):		7.500E+00	7.473E+00	7.429E+00	7.337E+00	7.276E+00	7.268E+00	7.261E+00	7.239E+00
0Th-228	Ra-228	1.000E+00	0.000E+00	2.135E+00	4.013E+00	2.988E+00	2.737E-01	4.543E-05	7.192E-16	0.000E+00
Th-228	Th-228	1.000E+00	7.500E+00	5.220E+00	2.529E+00	2.002E-01	1.427E-04	1.379E-15	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	1.397E-01	9.288E-01	4.180E+00	7.005E+00	7.268E+00	7.261E+00	7.239E+00
Th-228	S(j):		7.500E+00	7.496E+00	7.471E+00	7.368E+00	7.279E+00	7.268E+00	7.261E+00	7.239E+00
0Th-230	Th-230	1.000E+00	5.000E+00	5.000E+00	5.000E+00	4.999E+00	4.998E+00	4.993E+00	4.980E+00	4.933E+00
Th-230	U-234	1.000E+00	0.000E+00	4.489E-05	1.340E-04	4.383E-04	1.248E-03	3.489E-03	6.733E-03	8.337E-03
Th-230	U-238	1.000E+00	0.000E+00	6.357E-11	5.681E-10	6.158E-09	5.166E-08	4.511E-07	2.135E-06	4.343E-06
Th-230	S(j):		5.000E+00	5.000E+00	5.000E+00	5.000E+00	4.999E+00	4.997E+00	4.987E+00	4.942E+00
0Th-232	Th-232	1.000E+00	7.500E+00	7.500E+00	7.500E+00	7.500E+00	7.499E+00	7.497E+00	7.490E+00	7.467E+00
0U-234	U-234	1.000E+00	5.000E+00	4.974E+00	4.921E+00	4.741E+00	4.263E+00	2.939E+00	1.015E+00	2.462E-02
U-234	U-238	1.000E+00	0.000E+00	1.410E-05	4.185E-05	1.344E-04	3.626E-04	8.333E-04	8.640E-04	6.988E-05
U-234	S(j):		5.000E+00	4.974E+00	4.921E+00	4.741E+00	4.264E+00	2.940E+00	1.016E+00	2.469E-02
0U-238	U-238	1.000E+00	5.000E+00	4.974E+00	4.921E+00	4.741E+00	4.264E+00	2.940E+00	1.016E+00	2.469E-02

BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time = 36.91 seconds

RDRWWRK

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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	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				

D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.400E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.000E+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)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	7.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	5.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	7.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	5.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	5.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	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)	1.000E-03	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R013	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R013	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R013	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R013	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R013	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R013	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R013	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R013	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R013	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R013	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R013	Number of unsaturated zone strata	not used	1	---	NS
R013	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R013	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R013	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R013	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R013	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 Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.661E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.798E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.798E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.444E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.444E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.444E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.311E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.311E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.740E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	7.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	0.000E+00	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	0.000E+00	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	4.500E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)

R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	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)	3.650E+01	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
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)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

1RESRAD, Version 5.91 T½ Limit = 0.5 year 03/08/2000 13:06 Page 10
Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

Contaminated Zone Dimensions

Area:	1400.00 square meters
Thickness:	1.00 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g

Pb-210	5.000E+00
Ra-226	5.000E+00
Ra-228	7.500E+00
Th-228	7.500E+00
Th-230	5.000E+00
Th-232	7.500E+00
U-234	5.000E+00
U-238	5.000E+00

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 25 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.721E+00	1.718E+00	1.713E+00	1.696E+00	1.666E+00	1.597E+00	1.486E+00	1.409E+00
M(t):	6.883E-02	6.874E-02	6.853E-02	6.785E-02	6.664E-02	6.387E-02	5.945E-02	5.635E-02

0Maximum TDOSE(t): 1.721E+00 mrem/yr at t = 0.000E+00 years
1RESRAD, Version 5.91 T½ Limit = 0.5 year 03/08/2000 13:06 Page 11
Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.260E-04	0.0001	6.252E-03	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.871E-03	0.0034
Ra-226	2.268E-01	0.1318	2.449E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-03	0.0007
Ra-228	2.190E-01	0.1273	2.387E-02	0.0139	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.822E-03	0.0011
Th-228	2.610E-01	0.1517	1.190E-01	0.0691	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.350E-04	0.0005
Th-230	7.435E-05	0.0000	8.934E-02	0.0519	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.503E-04	0.0003
Th-232	1.254E-02	0.0073	6.752E-01	0.3924	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.472E-03	0.0020
U-234	8.416E-06	0.0000	3.608E-02	0.0210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.318E-04	0.0001
U-238	2.776E-03	0.0016	3.225E-02	0.0187	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.203E-04	0.0001
Total	7.223E-01	0.4198	9.844E-01	0.5721	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.408E-02	0.0082

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.225E-02	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.304E-01	0.1339
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.447E-01	0.1422
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.809E-01	0.2213
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.986E-02	0.0522
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.912E-01	0.4017
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	3.632E-02	0.0211
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	3.525E-02	0.0205
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	1.721E+00	1.0000

0*Sum of all water independent and dependent pathways.
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Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.218E-04	0.0001	6.044E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.676E-03	0.0033
Ra-226	2.258E-01	0.1314	2.630E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.356E-03	0.0008
Ra-228	2.677E-01	0.1558	5.495E-02	0.0320	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.847E-03	0.0011
Th-228	1.817E-01	0.1057	8.281E-02	0.0482	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.812E-04	0.0003
Th-230	1.724E-04	0.0001	8.934E-02	0.0520	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.508E-04	0.0003
Th-232	4.223E-02	0.0246	6.801E-01	0.3958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.694E-03	0.0021
U-234	8.372E-06	0.0000	3.589E-02	0.0209	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.306E-04	0.0001
U-238	2.761E-03	0.0016	3.208E-02	0.0187	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.192E-04	0.0001
Total	7.205E-01	0.4193	9.839E-01	0.5725	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.405E-02	0.0082

0

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

0	Water	Fish	Radon	Plant	Meat	Milk	All Pathways*

Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-02	0.0069
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.298E-01	0.1337
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.245E-01	0.1888
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.651E-01	0.1543
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.996E-02	0.0524
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.260E-01	0.4225
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	3.613E-02	0.0210
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	3.506E-02	0.0204
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	1.718E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	1.139E-04	0.0001	5.650E-03	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.306E-03	0.0031
Ra-226	2.239E-01	0.1307	2.969E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.684E-03	0.0010
Ra-228	2.905E-01	0.1695	8.009E-02	0.0467	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.701E-03	0.0010
Th-228	8.804E-02	0.0514	4.012E-02	0.0234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.816E-04	0.0002
Th-230	3.672E-04	0.0002	8.934E-02	0.0521	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.521E-04	0.0003
Th-232	1.110E-01	0.0648	6.971E-01	0.4069	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.125E-03	0.0024
U-234	8.289E-06	0.0000	3.551E-02	0.0207	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.281E-04	0.0001
U-238	2.732E-03	0.0016	3.174E-02	0.0185	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.169E-04	0.0001
Total	7.166E-01	0.4183	9.825E-01	0.5735	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.399E-02	0.0082

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.107E-02	0.0065
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.286E-01	0.1334
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.723E-01	0.2173
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.284E-01	0.0750
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.016E-02	0.0526
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.122E-01	0.4741
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	3.575E-02	0.0209
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	3.469E-02	0.0203
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	1.713E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	8.992E-05	0.0001	4.461E-03	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.189E-03	0.0025
Ra-226	2.174E-01	0.1282	3.961E-03	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.647E-03	0.0016
Ra-228	1.672E-01	0.0986	5.428E-02	0.0320	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.581E-04	0.0005
Th-228	6.969E-03	0.0041	3.176E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.229E-05	0.0000
Th-230	1.036E-03	0.0006	8.934E-02	0.0527	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.587E-04	0.0003
Th-232	3.091E-01	0.1822	7.579E-01	0.4469	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.194E-03	0.0031
U-234	8.030E-06	0.0000	3.422E-02	0.0202	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.198E-04	0.0001
U-238	2.632E-03	0.0016	3.058E-02	0.0180	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.089E-04	0.0001
Total	7.044E-01	0.4153	9.780E-01	0.5766	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.380E-02	0.0081

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.741E-03	0.0052
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.240E-01	0.1321
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.223E-01	0.1311
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E-02	0.0060
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.084E-02	0.0536
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E+00	0.6321
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	3.445E-02	0.0203
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	3.343E-02	0.0197
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	1.696E+00	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	4.579E-05	0.0000	2.272E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.133E-03	0.0013
Ra-226	1.998E-01	0.1199	5.564E-03	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.240E-03	0.0025

Ra-228	1.478E-02	0.0089	4.913E-03	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.416E-05	0.0000
Th-228	4.967E-06	0.0000	2.264E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.589E-08	0.0000
Th-230	2.842E-03	0.0017	8.936E-02	0.0536	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.895E-04	0.0003
Th-232	4.635E-01	0.2782	8.088E-01	0.4855	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.975E-03	0.0036
U-234	7.556E-06	0.0000	3.078E-02	0.0185	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.978E-04	0.0001
U-238	2.367E-03	0.0014	2.750E-02	0.0165	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.879E-04	0.0001
Total	6.834E-01	0.4102	9.692E-01	0.5818	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.330E-02	0.0080

0

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

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.451E-03	0.0027
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-01	0.1258
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.976E-02	0.0119
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.247E-06	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.269E-02	0.0556
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.278E+00	0.7673
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	3.099E-02	0.0186
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	3.006E-02	0.0180
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	1.666E+00	1.0000

0*Sum of all water independent and dependent pathways.

1RESRAD, Version 5.91 T½ Limit = 0.5 year 03/08/2000 13:06 Page 16
Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

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

0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.315E-06	0.0000	2.141E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.010E-04	0.0001
Ra-226	1.486E-01	0.0931	5.692E-03	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.612E-03	0.0029
Ra-228	2.453E-06	0.0000	8.156E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-08	0.0000
Th-228	4.801E-17	0.0000	2.188E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.536E-19	0.0000
Th-230	8.082E-03	0.0051	8.946E-02	0.0560	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.331E-04	0.0004
Th-232	4.777E-01	0.2992	8.133E-01	0.5094	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-03	0.0038
U-234	8.237E-06	0.0000	2.127E-02	0.0133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-04	0.0001
U-238	1.632E-03	0.0010	1.897E-02	0.0119	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E-04	0.0001
Total	6.361E-01	0.3984	9.489E-01	0.5943	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.176E-02	0.0074

0

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

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.194E-04	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.589E-01	0.0995
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.281E-06	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.004E-17	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.817E-02	0.0615
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.297E+00	0.8123
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-02	0.0134
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	2.073E-02	0.0130
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	1.597E+00	1.0000

0*Sum of all water independent and dependent pathways.

1RESRAD, Version 5.91 T½ Limit = 0.5 year 03/08/2000 13:06 Page 17
Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

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

0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.058E-09	0.0000	2.509E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.356E-07	0.0000
Ra-226	6.376E-02	0.0429	2.538E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.069E-03	0.0014
Ra-228	3.883E-17	0.0000	1.291E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.948E-19	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.674E-02	0.0113	8.956E-02	0.0603	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.102E-04	0.0006
Th-232	4.773E-01	0.3212	8.126E-01	0.5468	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.040E-03	0.0041
U-234	1.809E-05	0.0000	7.448E-03	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.811E-05	0.0000
U-238	5.643E-04	0.0004	6.562E-03	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.482E-05	0.0000
Total	5.584E-01	0.3757	9.187E-01	0.6182	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.112E-03	0.0061

0

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

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.916E-07	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.837E-02	0.0460
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.193E-17	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E-01	0.0721
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E+00	0.8720
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.514E-03	0.0051
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	7.171E-03	0.0048
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	1.486E+00	1.0000

0*Sum of all water independent and dependent pathways.
1RESRAD, Version 5.91 T½ Limit = 0.5 year 03/08/2000 13:06 Page 18
Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.790E-19	0.0000	1.384E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.300E-17	0.0000
Ra-226	3.298E-03	0.0023	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	1.070E-04	0.0001
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.273E-02	0.0161	8.897E-02	0.0632	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-03	0.0008
Th-232	4.758E-01	0.3377	8.101E-01	0.5750	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.021E-03	0.0043
U-234	3.716E-05	0.0000	3.279E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.960E-06	0.0000
U-238	1.372E-05	0.0000	1.598E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-06	0.0000
Total	5.019E-01	0.3563	8.997E-01	0.6386	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.233E-03	0.0051

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
0 Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.712E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.536E-03	0.0025
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.128E-01	0.0801
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.292E+00	0.9170
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	3.680E-04	0.0003
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	1.746E-04	0.0001
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	1.409E+00	1.0000

0*Sum of all water independent and dependent pathways.
1RESRAD, Version 5.91 T½ Limit = 0.5 year 03/08/2000 13:06 Page 19
Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated
0

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.450E-03	2.368E-03	2.214E-03	1.748E-03	8.902E-04	8.388E-05	9.833E-08	5.424E-18
0Ra-226	Ra-226	1.000E+00	4.604E-02	4.585E-02	4.546E-02	4.414E-02	4.055E-02	3.016E-02	1.294E-02	6.692E-04
Ra-226	Pb-210	1.000E+00	0.000E+00	1.128E-04	2.536E-04	6.687E-04	1.369E-03	1.627E-03	7.357E-04	3.805E-05
Ra-226	DSR(j)		4.604E-02	4.596E-02	4.572E-02	4.480E-02	4.192E-02	3.178E-02	1.367E-02	7.072E-04
0Ra-228	Ra-228	1.000E+00	2.327E-02	2.055E-02	1.603E-02	6.712E-03	5.582E-04	9.260E-08	1.466E-18	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	2.272E-02	3.361E-02	2.293E-02	2.077E-03	3.448E-07	5.458E-18	0.000E+00
Ra-228	DSR(j)		2.327E-02	4.327E-02	4.963E-02	2.964E-02	2.635E-03	4.374E-07	6.924E-18	0.000E+00
0Th-228	Th-228	1.000E+00	5.078E-02	3.535E-02	1.713E-02	1.356E-03	9.662E-07	9.339E-18	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	1.796E-02	1.796E-02	1.796E-02	1.796E-02	1.796E-02	1.794E-02	1.789E-02	1.772E-02
Th-230	Ra-226	1.000E+00	0.000E+00	2.989E-05	6.944E-05	2.053E-04	5.718E-04	1.635E-03	3.391E-03	4.607E-03
Th-230	Pb-210	1.000E+00	0.000E+00	3.835E-08	1.979E-07	1.625E-06	1.087E-05	6.047E-05	1.593E-04	2.287E-04
Th-230	DSR(j)		1.796E-02	1.799E-02	1.803E-02	1.817E-02	1.854E-02	1.963E-02	2.144E-02	2.256E-02
0Th-232	Th-232	1.000E+00	9.034E-02	9.034E-02	9.034E-02	9.033E-02	9.033E-02	9.030E-02	9.022E-02	8.994E-02
Th-232	Ra-228	1.000E+00	0.000E+00	4.070E-03	8.457E-03	1.749E-02	2.345E-02	2.398E-02	2.396E-02	2.389E-02
Th-232	Th-228	1.000E+00	0.000E+00	2.396E-03	9.502E-03	3.514E-02	5.666E-02	5.866E-02	5.861E-02	5.843E-02
Th-232	DSR(j)		9.034E-02	9.680E-02	1.083E-01	1.430E-01	1.704E-01	1.729E-01	1.728E-01	1.723E-01
0U-234	U-234	1.000E+00	7.264E-03	7.225E-03	7.149E-03	6.888E-03	6.193E-03	4.270E-03	1.475E-03	3.576E-05
U-234	Th-230	1.000E+00	0.000E+00	2.416E-07	5.607E-07	1.651E-06	4.552E-06	1.258E-05	2.421E-05	2.995E-05
U-234	Ra-226	1.000E+00	0.000E+00	2.089E-10	1.097E-09	9.600E-09	7.600E-08	6.642E-07	3.317E-06	7.524E-06
U-234	Pb-210	1.000E+00	0.000E+00	1.854E-13	2.119E-12	5.221E-11	1.043E-09	2.006E-08	1.454E-07	3.717E-07
U-234	DSR(j)		7.264E-03	7.226E-03	7.149E-03	6.890E-03	6.198E-03	4.283E-03	1.503E-03	7.361E-05
0U-238	U-238	1.000E+00	7.050E-03	7.012E-03	6.938E-03	6.685E-03	6.011E-03	4.145E-03	1.433E-03	3.481E-05
U-238	U-234	1.000E+00	0.000E+00	3.072E-08	7.093E-08	2.050E-07	5.355E-07	1.217E-06	1.257E-06	1.016E-07
U-238	Th-230	1.000E+00	0.000E+00	5.318E-13	2.792E-12	2.437E-11	1.915E-10	1.634E-09	7.684E-09	1.560E-08
U-238	Ra-226	1.000E+00	0.000E+00	3.169E-16	3.671E-15	9.487E-14	2.155E-12	5.969E-11	7.907E-10	3.675E-09
U-238	Pb-210	1.000E+00	0.000E+00	2.177E-19	5.382E-18	3.937E-16	2.321E-14	1.523E-12	3.217E-11	1.798E-10
U-238	DSR(j)		7.050E-03	7.012E-03	6.938E-03	6.685E-03	6.012E-03	4.146E-03	1.434E-03	3.493E-05

*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.
1RESRAD, Version 5.91 T½ Limit = 0.5 year 03/08/2000 13:06 Page 20
Summary : RDRWWRK--Reading Right-of-Way Worker File: RDRWWRK.RAD

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 25 mrem/yr
0

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	1.021E+04	1.056E+04	1.129E+04	1.430E+04	2.808E+04	2.981E+05	2.542E+08	*7.631E+13
Ra-226	5.425E+02	5.439E+02	5.468E+02	5.580E+02	5.963E+02	7.865E+02	1.828E+03	3.535E+04
Ra-228	7.663E+02	5.778E+02	5.037E+02	8.435E+02	9.487E+03	5.715E+07	*2.726E+14	*2.726E+14
Th-228	4.923E+02	7.073E+02	1.460E+03	1.844E+04	2.587E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	1.391E+03	1.389E+03	1.386E+03	1.376E+03	1.349E+03	1.273E+03	1.166E+03	1.108E+03
Th-232	2.713E+02	2.583E+02	2.308E+02	1.749E+02	1.467E+02	1.446E+02	1.447E+02	1.451E+02
U-234	3.442E+03	3.460E+03	3.497E+03	3.629E+03	4.034E+03	5.837E+03	1.664E+04	3.396E+05
U-238	3.546E+03	3.565E+03	3.603E+03	3.740E+03	4.158E+03	6.030E+03	1.743E+04	*3.360E+05

*At specific activity limit
0

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
0

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)

Pb-210	5.000E+00	0.000E+00	2.450E-03	1.021E+04	2.450E-03	1.021E+04
Ra-226	5.000E+00	0.000E+00	4.608E-02	5.425E+02	4.608E-02	5.425E+02
Ra-228	7.500E-00	3.015 ñ 0.006	4.963E-02	5.037E+02	3.262E-02	7.663E+02
Th-228	7.500E+00	0.000E+00	5.078E-02	4.923E+02	5.078E-02	4.923E+02
Th-230	5.000E+00	1.000E+03	2.256E-02	1.108E+03	1.797E-02	1.391E+03
Th-232	7.500E+00	78.5 ñ 0.2	1.730E-01	1.445E+02	9.216E-02	2.713E+02
U-234	5.000E+00	0.000E+00	7.264E-03	3.442E+03	7.264E-03	3.442E+03
U-238	5.000E+00	0.000E+00	7.050E-03	3.546E+03	7.050E-03	3.546E+03

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	1.225E-02	1.184E-02	1.107E-02	8.741E-03	4.451E-03	4.194E-04	4.916E-07	2.712E-17
Pb-210	Ra-226	1.000E+00	1.912E-04	5.639E-04	1.268E-03	3.344E-03	6.843E-03	8.133E-03	3.678E-03	1.903E-04
Pb-210	Th-230	1.000E+00	2.769E-08	1.918E-07	9.893E-07	8.125E-06	5.437E-05	3.023E-04	7.964E-04	1.144E-03
Pb-210	U-234	1.000E+00	6.237E-14	9.270E-13	1.060E-11	2.611E-10	5.215E-09	1.003E-07	7.270E-07	1.859E-06
Pb-210	U-238	1.000E+00	3.576E-20	1.088E-18	2.691E-17	1.968E-15	1.161E-13	7.616E-12	1.609E-10	8.992E-10
Pb-210	DOSE(j):		1.244E-02	1.241E-02	1.234E-02	1.209E-02	1.135E-02	8.855E-03	4.476E-03	1.336E-03
0Ra-226	Ra-226	1.000E+00	2.302E-01	2.292E-01	2.273E-01	2.207E-01	2.028E-01	1.508E-01	6.469E-02	3.346E-03
Ra-226	Th-230	1.000E+00	4.990E-05	1.494E-04	3.472E-04	1.026E-03	2.859E-03	8.176E-03	1.696E-02	2.304E-02
Ra-226	U-234	1.000E+00	1.496E-10	1.044E-09	5.486E-09	4.800E-08	3.800E-07	3.321E-06	1.659E-05	3.762E-05
Ra-226	U-238	1.000E+00	1.060E-16	1.584E-15	1.835E-14	4.743E-13	1.078E-11	2.985E-10	3.953E-09	1.837E-08
Ra-226	DOSE(j):		2.303E-01	2.294E-01	2.277E-01	2.217E-01	2.056E-01	1.590E-01	8.166E-02	2.642E-02
0Ra-228	Ra-228	1.000E+00	1.745E-01	1.541E-01	1.202E-01	5.034E-02	4.186E-03	6.945E-07	1.099E-17	0.000E+00
Ra-228	Th-232	1.000E+00	1.074E-02	3.052E-02	6.343E-02	1.312E-01	1.759E-01	1.799E-01	1.797E-01	1.792E-01
Ra-228	DOSE(j):		1.853E-01	1.847E-01	1.836E-01	1.815E-01	1.801E-01	1.799E-01	1.797E-01	1.792E-01
0Th-228	Ra-228	1.000E+00	7.013E-02	1.704E-01	2.521E-01	1.720E-01	1.558E-02	2.586E-06	4.094E-17	0.000E+00
Th-228	Th-228	1.000E+00	3.809E-01	2.651E-01	1.284E-01	1.017E-02	7.247E-06	7.004E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	2.933E-03	1.797E-02	7.127E-02	2.636E-01	4.250E-01	4.400E-01	4.396E-01	4.382E-01
Th-228	DOSE(j):		4.539E-01	4.534E-01	4.518E-01	4.457E-01	4.406E-01	4.400E-01	4.396E-01	4.382E-01
0Th-230	Th-230	1.000E+00	8.981E-02	8.981E-02	8.981E-02	8.980E-02	8.978E-02	8.969E-02	8.945E-02	8.862E-02
Th-230	U-234	1.000E+00	4.035E-07	1.208E-06	2.803E-06	8.256E-06	2.276E-05	6.291E-05	1.210E-04	1.498E-04
Th-230	U-238	1.000E+00	3.810E-13	2.659E-12	1.396E-11	1.218E-10	9.576E-10	8.171E-09	3.842E-08	7.801E-08
Th-230	DOSE(j):		8.982E-02	8.981E-02	8.981E-02	8.981E-02	8.980E-02	8.976E-02	8.957E-02	8.877E-02
0Th-232	Th-232	1.000E+00	6.775E-01	6.775E-01	6.775E-01	6.775E-01	6.775E-01	6.772E-01	6.766E-01	6.745E-01
0U-234	U-234	1.000E+00	3.632E-02	3.613E-02	3.574E-02	3.444E-02	3.097E-02	2.135E-02	7.376E-03	1.788E-04
U-234	U-238	1.000E+00	5.144E-08	1.536E-07	3.546E-07	1.025E-06	2.678E-06	6.083E-06	6.286E-06	5.079E-07
U-234	DOSE(j):		3.632E-02	3.613E-02	3.574E-02	3.444E-02	3.097E-02	2.135E-02	7.382E-03	1.793E-04
0U-238	U-238	1.000E+00	3.525E-02	3.506E-02	3.469E-02	3.343E-02	3.006E-02	2.072E-02	7.164E-03	1.740E-04

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.000E+00	4.834E+00	4.519E+00	3.568E+00	1.817E+00	1.712E-01	2.007E-04	1.107E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	1.525E-01	4.406E-01	1.290E+00	2.725E+00	3.269E+00	1.480E+00	7.653E-02
Pb-210	Th-230	1.000E+00	0.000E+00	3.324E-05	2.918E-04	2.974E-03	2.123E-02	1.207E-01	3.194E-01	4.591E-01
Pb-210	U-234	1.000E+00	0.000E+00	9.993E-11	2.641E-09	9.081E-08	2.002E-06	3.982E-05	2.911E-04	7.459E-04
Pb-210	U-238	1.000E+00	0.000E+00	7.121E-17	5.633E-15	6.504E-13	4.378E-11	3.008E-09	6.433E-08	3.608E-07
Pb-210	S(j):		5.000E+00	4.987E+00	4.959E+00	4.861E+00	4.563E+00	3.561E+00	1.799E+00	5.363E-01
0Ra-226	Ra-226	1.000E+00	5.000E+00	4.979E+00	4.937E+00	4.793E+00	4.404E+00	3.275E+00	1.405E+00	7.267E-02
Ra-226	Th-230	1.000E+00	0.000E+00	2.161E-03	6.457E-03	2.121E-02	6.101E-02	1.765E-01	3.672E-01	4.992E-01
Ra-226	U-234	1.000E+00	0.000E+00	9.718E-09	8.691E-08	9.444E-07	7.979E-06	7.137E-05	3.588E-04	8.152E-04
Ra-226	U-238	1.000E+00	0.000E+00	9.179E-15	2.460E-13	8.877E-12	2.226E-10	6.384E-09	8.540E-08	3.981E-07
Ra-226	S(j):		5.000E+00	4.981E+00	4.943E+00	4.814E+00	4.465E+00	3.452E+00	1.773E+00	5.727E-01
0Ra-228	Ra-228	1.000E+00	7.500E+00	6.623E+00	5.165E+00	2.163E+00	1.799E-01	2.984E-05	4.724E-16	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	8.502E-01	2.264E+00	5.174E+00	7.096E+00	7.268E+00	7.261E+00	7.239E+00
Ra-228	S(j):		7.500E+00	7.473E+00	7.429E+00	7.337E+00	7.276E+00	7.268E+00	7.261E+00	7.239E+00
0Th-228	Ra-228	1.000E+00	0.000E+00	2.135E+00	4.013E+00	2.988E+00	2.737E-01	4.543E-05	7.192E-16	0.000E+00
Th-228	Th-228	1.000E+00	7.500E+00	5.220E+00	2.529E+00	2.002E-01	1.427E-04	1.379E-15	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	1.397E-01	9.288E-01	4.180E+00	7.005E+00	7.268E+00	7.261E+00	7.239E+00
Th-228	S(j):		7.500E+00	7.496E+00	7.471E+00	7.368E+00	7.279E+00	7.268E+00	7.261E+00	7.239E+00
0Th-230	Th-230	1.000E+00	5.000E+00	5.000E+00	5.000E+00	4.999E+00	4.998E+00	4.993E+00	4.980E+00	4.933E+00
Th-230	U-234	1.000E+00	0.000E+00	4.489E-05	1.340E-04	4.383E-04	1.248E-03	3.489E-03	6.733E-03	8.337E-03
Th-230	U-238	1.000E+00	0.000E+00	6.357E-11	5.681E-10	6.158E-09	5.166E-08	4.511E-07	2.135E-06	4.343E-06
Th-230	S(j):		5.000E+00	5.000E+00	5.000E+00	5.000E+00	4.999E+00	4.997E+00	4.987E+00	4.942E+00
0Th-232	Th-232	1.000E+00	7.500E+00	7.500E+00	7.500E+00	7.500E+00	7.499E+00	7.497E+00	7.490E+00	7.467E+00
0U-234	U-234	1.000E+00	5.000E+00	4.974E+00	4.921E+00	4.741E+00	4.263E+00	2.939E+00	1.015E+00	2.462E-02
U-234	U-238	1.000E+00	0.000E+00	1.410E-05	4.185E-05	1.344E-04	3.626E-04	8.333E-04	8.640E-04	6.988E-05
U-234	S(j):		5.000E+00	4.974E+00	4.921E+00	4.741E+00	4.264E+00	2.940E+00	1.016E+00	2.469E-02
0U-238	U-238	1.000E+00	5.000E+00	4.974E+00	4.921E+00	4.741E+00	4.264E+00	2.940E+00	1.016E+00	2.469E-02

BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time = 23.89 seconds

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

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				

D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.500E+01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.500E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	2.250E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	2.250E+01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.500E+01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	2.250E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	1.500E+01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)

R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-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)	2.050E-02	2.500E-01	---	FOCD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

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            9 -- radon                        suppressed
            Find peak pathway doses           suppressed

1RESRAD, Version 5.91     T½ Limit = 0.5 year        03/08/2000  10:01  Page  10
 Summary : CBRDBT Cabot Reading BT                                File: CBRDBT.RAD

      Contaminated Zone Dimensions            Initial Soil Concentrations, pCi/g

         Area:  10000.00 square meters                Pb-210     1.500E+01
   Thickness:       2.00 meters                       Ra-226     1.500E+01
 Cover Depth:       0.00 meters                       Ra-228     2.250E+01
                                                      Th-228     2.250E+01
                                                      Th-230     1.500E+01
                                                      Th-232     2.250E+01
                                                      U-234      1.500E+01
                                                      U-238      1.500E+01
0
                                  Total Dose TDOSE(t), mrem/yr
                             Basic Radiation Dose Limit =  30 mrem/yr
             Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

    t (years):  0.000E+00  1.000E+00  3.000E+00  1.000E+01  3.000E+01  1.000E+02  3.000E+02  1.000E+03
     TDOSE(t):  1.097E+01  1.096E+01  1.096E+01  1.094E+01  1.090E+01  1.074E+01  1.031E+01  8.933E+00
        M(t):  3.655E-01  3.654E-01  3.653E-01  3.648E-01  3.633E-01  3.581E-01  3.437E-01  2.978E-01
0Maximum TDOSE(t):  1.097E+01 mrem/yr   at t = 0.000E+00 years
1RESRAD, Version 5.91     T½ Limit = 0.5 year        03/08/2000  10:01  Page  11
 Summary : CBRDBT Cabot Reading BT                                File: CBRDBT.RAD

                     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
0                                   Water Independent Pathways (Inhalation excludes radon)
0          Ground          Inhalation          Radon           Plant           Meat            Milk            Soil
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  1.815E-03 0.0002 2.901E-03 0.0003 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 8.033E-02 0.0073
 Ra-226  3.242E+00 0.2957 1.137E-03 0.0001 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.618E-02 0.0015
 Ra-228  3.132E+00 0.2856 1.108E-02 0.0010 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 2.494E-02 0.0023
 Th-228  3.720E+00 0.3392 5.514E-02 0.0050 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.141E-02 0.0010
 Th-230  1.060E-03 0.0001 4.141E-02 0.0038 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 6.153E-03 0.0006
 Th-232  1.793E-01 0.0164 3.129E-01 0.0285 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 4.745E-02 0.0043
 U-234   1.198E-04 0.0000 1.677E-02 0.0015 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.176E-03 0.0003
 U-238   3.973E-02 0.0036 1.499E-02 0.0014 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.019E-03 0.0003

 Total   1.032E+01 0.9408 4.563E-01 0.0416 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.927E-01 0.0176
0
                     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
0                                                   Water Dependent Pathways
0           Water           Fish            Radon           Plant           Meat            Milk            All Pathways*
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 8.505E-02 0.0078
 Ra-226  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.260E+00 0.2973
 Ra-228  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.168E+00 0.2889
 Th-228  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.787E+00 0.3453
 Th-230  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 4.862E-02 0.0044
 Th-232  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 5.397E-01 0.0492
 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 2.006E-02 0.0018
 U-238   0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 5.773E-02 0.0053

 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 1.097E+01 1.0000
0*Sum of all water independent and dependent pathways.
1RESRAD, Version 5.91     T½ Limit = 0.5 year        03/08/2000  10:01  Page  12
 Summary : CBRDBT Cabot Reading BT                                File: CBRDBT.RAD

                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                  As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
0                                   Water Independent Pathways (Inhalation excludes radon)
0          Ground          Inhalation          Radon           Plant           Meat            Milk            Soil
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  1.759E-03 0.0002 2.812E-03 0.0003 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 7.786E-02 0.0071
 Ra-226  3.240E+00 0.2956 1.225E-03 0.0001 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.862E-02 0.0017
 Ra-228  3.837E+00 0.3500 2.554E-02 0.0023 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 2.536E-02 0.0023
 Th-228  2.589E+00 0.2361 3.837E-02 0.0035 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 7.941E-03 0.0007
 Th-230  2.464E-03 0.0002 4.140E-02 0.0038 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 6.160E-03 0.0006
 Th-232  6.043E-01 0.0551 3.152E-01 0.0287 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 5.048E-02 0.0046
 U-234   1.198E-04 0.0000 1.676E-02 0.0015 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.175E-03 0.0003
 U-238   3.972E-02 0.0036 1.498E-02 0.0014 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.018E-03 0.0003

 Total   1.031E+01 0.9408 4.563E-01 0.0416 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.926E-01 0.0176
0
                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                  As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
0                                                   Water Dependent Pathways
0           Water           Fish            Radon           Plant           Meat            Milk            All Pathways*
 Radio-
 Nuclide  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.

 Pb-210  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 8.243E-02 0.0075
 Ra-226  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.260E+00 0.2974
 Ra-228  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 3.888E+00 0.3546
 Th-228  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 2.635E+00 0.2404
 Th-230  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 5.002E-02 0.0046
 Th-232  0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 9.699E-01 0.0885
 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 2.006E-02 0.0018
 U-238   0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 5.772E-02 0.0053

 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 1.096E+01 1.0000
0*Sum of all water independent and dependent pathways.
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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.652E-03	0.0002	2.641E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.314E-02	0.0067
Ra-226	3.236E+00	0.2953	1.393E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.329E-02	0.0021
Ra-228	4.182E+00	0.3816	3.738E-02	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.350E-02	0.0021
Th-228	1.254E+00	0.1144	1.858E-02	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.846E-03	0.0004
Th-230	5.268E-03	0.0005	4.138E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.175E-03	0.0006
Th-232	1.591E+00	0.1452	3.229E-01	0.0295	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.640E-02	0.0051
U-234	1.198E-04	0.0000	1.676E-02	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.174E-03	0.0003
U-238	3.970E-02	0.0036	1.498E-02	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.017E-03	0.0003
Total	1.031E-01	0.9408	4.561E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.925E-01	0.0176

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

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.743E-02	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.261E+00	0.2976
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.243E+00	0.3872
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.276E+00	0.1165
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.282E-02	0.0048
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.971E+00	0.1798
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	2.005E-02	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.770E-02	0.0053
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	1.096E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.327E-03	0.0001	2.122E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.875E-02	0.0054
Ra-226	3.222E+00	0.2944	1.902E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.744E-02	0.0034
Ra-228	2.454E+00	0.2243	2.581E-02	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.211E-02	0.0011
Th-228	9.911E-02	0.0091	1.469E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.040E-04	0.0000
Th-230	1.504E-02	0.0014	4.132E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.259E-03	0.0006
Th-232	4.464E+00	0.4079	3.511E-01	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.121E-02	0.0065
U-234	1.203E-04	0.0000	1.673E-02	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.170E-03	0.0003
U-238	3.964E-02	0.0036	1.496E-02	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.013E-03	0.0003
Total	1.030E+01	0.9408	4.554E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.923E-01	0.0176

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

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.220E-02	0.0057
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.261E+00	0.2980
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.492E+00	0.2277
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.009E-01	0.0092
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.263E-02	0.0057
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.886E+00	0.4465
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	2.002E-02	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.761E-02	0.0053
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	1.094E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.100E-04	0.0001	1.135E-03	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.142E-02	0.0029
Ra-226	3.182E+00	0.2920	2.851E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.393E-02	0.0059
Ra-228	2.325E-01	0.0213	2.502E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.123E-03	0.0001
Th-228	7.036E-05	0.0000	1.043E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.158E-07	0.0000
Th-230	4.266E-02	0.0039	4.117E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.683E-03	0.0006
Th-232	6.756E+00	0.6199	3.743E-01	0.0343	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.216E-02	0.0075
U-234	1.250E-04	0.0000	1.667E-02	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.158E-03	0.0003
U-238	3.948E-02	0.0036	1.490E-02	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.001E-03	0.0003
Total	1.025E+01	0.9408	4.535E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.915E-01	0.0176

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

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.

Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.327E-02	0.0031
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.249E+00	0.2981
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.361E-01	0.0217
Th-228	0.000E-00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.162E-05	0.0000
Th-230	0.000E-00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.052E-02	0.0083
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.212E+00	0.6618
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	1.996E-02	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.738E-02	0.0053
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	1.090E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 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.
Pb-210	7.945E-05	0.0000	1.270E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.516E-03	0.0003
Ra-226	3.043E+00	0.2833	3.699E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.804E-02	0.0082
Ra-228	4.962E-05	0.0000	5.340E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.396E-07	0.0000
Th-228	6.706E-16	0.0000	9.939E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.057E-18	0.0000
Th-230	1.357E-01	0.0126	4.066E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.015E-03	0.0008
Th-232	6.889E+00	0.6412	3.715E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.210E-02	0.0076
U-234	1.793E-04	0.0000	1.646E-02	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.117E-03	0.0003
U-238	3.892E-02	0.0036	1.469E-02	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.958E-03	0.0003
Total	1.011E+01	0.9408	4.471E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.887E-01	0.0176

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

0 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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.723E-03	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.135E+00	0.2918
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.039E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.826E-16	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.854E-01	0.0173
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.342E+00	0.6835
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	1.975E-02	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.657E-02	0.0053
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	1.074E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 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.
Pb-210	1.522E-07	0.0000	2.433E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.737E-06	0.0000
Ra-226	2.679E+00	0.2598	3.369E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.062E-02	0.0078
Ra-228	1.612E-15	0.0000	1.734E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.781E-18	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	3.722E-01	0.0361	3.926E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.588E-02	0.0015
Th-232	6.612E+00	0.6412	3.565E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.880E-02	0.0076
U-234	6.275E-04	0.0001	1.586E-02	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.012E-03	0.0003
U-238	3.736E-02	0.0036	1.411E-02	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.841E-03	0.0003
Total	9.701E+00	0.9408	4.291E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-01	0.0176

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

0 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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.132E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.763E+00	0.2679
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.637E-15	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.274E-01	0.0414
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.047E+00	0.6835
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	1.950E-02	0.0019
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.430E-02	0.0053
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	1.031E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 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.
Pb-210	4.685E-17	0.0000	7.489E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.074E-15	0.0000
Ra-226	1.714E+00	0.1918	2.155E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.158E-02	0.0058
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Th-230	9.255E-01	0.1036	3.456E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.188E-02	0.0036
Th-232	5.728E+00	0.6412	3.089E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.826E-02	0.0076
U-234	4.569E-03	0.0005	1.393E-02	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.751E-03	0.0003
U-238	3.236E-02	0.0036	1.225E-02	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.467E-03	0.0003
Total	8.404E+00	0.9408	3.717E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.569E-01	0.0176

0

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

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.195E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.767E+00	0.1978
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.919E-01	0.1110
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.105E+00	0.6835
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	2.125E-02	0.0024
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	4.708E-02	0.0053
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	8.933E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.670E-03	5.495E-03	5.162E-03	4.147E-03	2.218E-03	2.482E-04	4.755E-07	1.464E-16
0Ra-226	Ra-226	1.000E+00	2.172E-01	2.171E-01	2.168E-01	2.158E-01	2.131E-01	2.038E-01	1.794E-01	1.147E-01
Ra-226	Pb-210	1.000E+00	0.000E+00	2.620E-04	5.926E-04	1.596E-03	3.479E-03	5.226E-03	4.821E-03	3.084E-03
Ra-226	DSR(j)		2.172E-01	2.173E-01	2.174E-01	2.174E-01	2.166E-01	2.090E-01	1.842E-01	1.178E-01
0Ra-228	Ra-228	1.000E+00	1.098E-01	9.730E-02	7.642E-02	3.282E-02	2.933E-03	6.257E-07	2.032E-17	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	7.550E-02	1.122E-01	7.795E-02	7.561E-03	1.614E-06	5.242E-17	0.000E+00
Ra-228	DSR(j)		1.098E-01	1.728E-01	1.886E-01	1.108E-01	1.049E-02	2.240E-06	7.274E-17	0.000E+00
0Th-228	Th-228	1.000E+00	1.683E-01	1.171E-01	5.672E-02	4.484E-03	3.183E-06	3.034E-17	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	3.194E-03	3.194E-03	3.192E-03	3.187E-03	3.174E-03	3.127E-03	2.996E-03	2.579E-03
Th-230	Ra-226	1.000E+00	0.000E+00	1.411E-04	3.290E-04	9.840E-04	2.834E-03	9.064E-03	2.490E-02	6.195E-02
Th-230	Pb-210	1.000E+00	0.000E+00	8.894E-08	4.606E-07	3.833E-06	2.664E-05	1.675E-04	5.930E-04	1.599E-03
Th-230	DSR(j)		3.194E-03	3.335E-03	3.522E-03	4.175E-03	6.034E-03	1.236E-02	2.849E-02	6.613E-02
0Th-232	Th-232	1.000E+00	1.594E-02	1.594E-02	1.593E-02	1.591E-02	1.584E-02	1.562E-02	1.499E-02	1.298E-02
Th-232	Ra-228	1.000E+00	0.000E+00	1.921E-02	4.004E-02	8.348E-02	1.129E-01	1.142E-01	1.096E-01	9.493E-02
Th-232	Th-228	1.000E+00	0.000E+00	7.957E-03	3.162E-02	1.178E-01	1.918E-01	1.965E-01	1.886E-01	1.634E-01
Th-232	DSR(j)		1.594E-02	4.311E-02	8.759E-02	2.172E-01	3.206E-01	3.263E-01	3.132E-01	2.713E-01
0U-234	U-234	1.000E+00	1.337E-03	1.337E-03	1.337E-03	1.335E-03	1.329E-03	1.310E-03	1.257E-03	1.086E-03
U-234	Th-230	1.000E+00	0.000E+00	4.312E-08	1.006E-07	3.013E-07	8.715E-07	2.829E-06	8.111E-06	2.330E-05
U-234	Ra-226	1.000E+00	0.000E+00	9.880E-10	5.219E-09	4.657E-08	3.899E-07	4.130E-06	3.442E-05	2.993E-04
U-234	Pb-210	1.000E+00	0.000E+00	4.305E-13	4.947E-12	1.242E-10	2.621E-09	6.098E-08	7.406E-07	7.470E-06
U-234	DSR(j)		1.337E-03	1.337E-03	1.337E-03	1.335E-03	1.330E-03	1.317E-03	1.300E-03	1.416E-03
0U-238	U-238	1.000E+00	3.849E-03	3.848E-03	3.846E-03	3.841E-03	3.825E-03	3.771E-03	3.619E-03	3.135E-03
U-238	U-234	1.000E+00	0.000E+00	5.686E-09	1.326E-08	3.973E-08	1.149E-07	3.733E-07	1.071E-06	3.086E-06
U-238	Th-230	1.000E+00	0.000E+00	9.508E-14	5.024E-13	4.488E-12	3.768E-11	4.032E-10	3.457E-09	3.310E-08
U-238	Ra-226	1.000E+00	0.000E+00	1.481E-15	1.748E-14	4.630E-13	1.125E-11	3.937E-10	9.882E-09	2.932E-07
U-238	Pb-210	1.000E+00	0.000E+00	3.183E-19	1.236E-17	9.412E-16	5.920E-14	4.874E-12	1.944E-10	7.089E-09
U-238	DSR(j)		3.849E-03	3.848E-03	3.846E-03	3.841E-03	3.825E-03	3.771E-03	3.620E-03	3.139E-03

*Branch Fraction is the cumulative factor for the j'th 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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	5.291E+03	5.459E+03	5.812E+03	7.235E+03	1.353E+04	1.209E+05	6.309E+07	*7.631E+13
Ra-226	1.381E+02	1.380E+02	1.380E+02	1.380E+02	1.385E+02	1.435E+02	1.629E+02	2.546E+02
Ra-228	2.130E+02	1.736E+02	1.591E+02	2.708E+02	2.859E+03	1.339E+07	*2.726E+14	*2.726E+14
Th-228	1.783E+02	2.562E+02	5.289E+02	6.691E+03	9.425E+06	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	9.256E+03	8.996E+03	8.519E+03	7.185E+03	4.972E+03	2.428E+03	1.053E+03	4.537E+02
Th-232	1.251E+03	6.959E+02	3.425E+02	1.381E+02	9.359E+01	9.193E+01	9.578E+01	1.106E+02
U-234	2.243E+04	2.244E+04	2.244E+04	2.247E+04	2.255E+04	2.278E+04	2.308E+04	2.118E+04
U-238	7.795E+03	7.796E+03	7.799E+03	7.811E+03	7.843E+03	7.955E+03	8.287E+03	9.558E+03

*A specific activity limit

0

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

0N de	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
P 0	1.500E+01	0.000E+00	5.670E-03	5.291E+03	5.670E-03	5.291E+03
R 6	1.500E+01	7.64 ñ 0.02	2.174E-01	1.380E+02	2.173E-01	1.381E+02
R 8	2.250E+01	2.712 ñ 0.005	1.889E-01	1.588E+02	1.408E-01	2.130E+02
T	2.250E+01	0.000E+00	1.683E-01	1.783E+02	1.683E-01	1.783E+02
T	1.500E+01	1.000E+03	6.613E-02	4.537E+02	3.241E-03	9.256E+03
T	2.250E+01	54.3 ñ 0.1	3.288E-01	9.123E+01	2.399E-02	1.251E+03
U	1.500E+01	1.000E+03	1.416E-03	2.118E+04	1.337E-03	2.243E+04
U	1.500E+01	0.000E+00	3.849E-03	7.795E+03	3.849E-03	7.795E+03

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	8.505E-02	8.243E-02	7.743E-02	6.220E-02	3.327E-02	3.723E-03	7.132E-06	2.195E-15
Pb-210	Ra-226	1.000E+00	1.328E-03	3.929E-03	8.888E-03	2.394E-02	5.218E-02	7.839E-02	7.231E-02	4.626E-02
Pb-210	Th-230	1.000E+00	1.923E-07	1.334E-06	6.908E-06	5.750E-05	3.996E-04	2.512E-03	8.896E-03	2.399E-02
Pb-210	U-234	1.000E+00	4.335E-13	6.458E-12	7.420E-11	1.863E-09	3.932E-08	9.147E-07	1.111E-05	1.120E-04
Pb-210	U-238	1.000E+00	0.000E+00	4.774E-18	1.853E-16	1.412E-14	8.880E-13	7.311E-11	2.916E-09	1.063E-07
Pb-210	DOSE(j):		8.638E-02	8.636E-02	8.633E-02	8.620E-02	8.585E-02	8.463E-02	8.122E-02	7.036E-02
0Ra-226	Ra-226	1.000E+00	3.258E+00	3.256E+00	3.252E+00	3.238E+00	3.196E+00	3.057E+00	2.690E+00	1.721E+00
Ra-226	Th-230	1.000E+00	7.058E-04	2.117E-03	4.935E-03	1.476E-02	4.251E-02	1.360E-01	3.736E-01	9.292E-01
Ra-226	U-234	1.000E+00	2.118E-09	1.482E-08	7.828E-08	6.986E-07	5.849E-06	6.195E-05	5.163E-04	4.489E-03
Ra-226	U-238	1.000E+00	1.266E-15	2.221E-14	2.622E-13	6.944E-12	1.688E-10	5.906E-09	1.482E-07	4.398E-06
Ra-226	DOSE(j):		3.259E+00	3.258E+00	3.257E+00	3.252E+00	3.239E+00	3.193E+00	3.065E+00	2.655E+00
0Ra-228	Ra-228	1.000E+00	2.470E+00	2.189E+00	1.720E+00	7.384E-01	6.599E-02	1.408E-05	4.572E-16	0.000E+00
Ra-228	Th-232	1.000E+00	1.519E-01	4.323E-01	9.010E-01	1.878E+00	2.540E+00	2.569E+00	2.466E+00	2.136E+00
Ra-228	DOSE(j):		2.622E+00	2.622E+00	2.620E+00	2.617E+00	2.606E+00	2.569E+00	2.466E+00	2.136E+00
0Th-228	Ra-228	1.000E+00	6.981E-01	1.699E+00	2.524E+00	1.754E+00	1.701E-01	3.632E-05	1.179E-15	0.000E+00
Th-228	Th-228	1.000E+00	3.787E+00	2.635E+00	1.276E+00	1.009E-01	7.162E-05	6.826E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	2.918E-02	1.790E-01	7.114E-01	2.650E+00	4.316E+00	4.422E+00	4.245E+00	3.677E+00
Th-228	DOSE(j):		4.514E+00	4.513E+00	4.511E+00	4.505E+00	4.486E+00	4.422E+00	4.245E+00	3.677E+00
0Th-230	Th-230	1.000E+00	4.791E-02	4.790E-02	4.788E-02	4.781E-02	4.761E-02	4.690E-02	4.493E-02	3.868E-02
Th-230	U-234	1.000E+00	2.156E-07	6.468E-07	1.509E-06	4.519E-06	1.307E-05	4.244E-05	1.217E-04	3.494E-04
Th-230	U-238	1.000E+00	2.038E-13	1.426E-12	7.535E-12	6.731E-11	5.652E-10	6.047E-09	5.185E-08	4.966E-07
Th-230	DOSE(j):		4.791E-02	4.790E-02	4.788E-02	4.782E-02	4.762E-02	4.694E-02	4.505E-02	3.903E-02
0Th-232	Th-232	1.000E+00	3.586E-01	3.586E-01	3.584E-01	3.579E-01	3.564E-01	3.514E-01	3.372E-01	2.921E-01
0U-234	U-234	1.000E+00	2.006E-02	2.006E-02	2.005E-02	2.002E-02	1.994E-02	1.965E-02	1.885E-02	1.630E-02
U-234	U-238	1.000E+00	2.844E-08	8.529E-08	1.989E-07	5.959E-07	1.724E-06	5.599E-06	1.606E-05	4.629E-05
U-234	DOSE(j):		2.006E-02	2.006E-02	2.005E-02	2.002E-02	1.994E-02	1.965E-02	1.886E-02	1.634E-02
0U-238	U-238	1.000E+00	5.773E-02	5.772E-02	5.770E-02	5.761E-02	5.739E-02	5.656E-02	5.429E-02	4.703E-02

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	1.500E+01	1.454E+01	1.366E+01	1.097E+01	5.867E+00	6.566E-01	1.258E-03	3.872E-13
Pb-210	Ra-226	1.000E+00	0.000E+00	4.589E-01	1.334E+00	3.990E+00	8.973E+00	1.361E+01	1.256E+01	8.035E+00
Pb-210	Th-230	1.000E+00	0.000E+00	9.992E-05	8.804E-04	9.097E-03	6.743E-02	4.333E-01	1.542E+00	4.164E+00
Pb-210	U-234	1.000E+00	0.000E+00	3.006E-10	7.987E-09	2.800E-07	6.519E-06	1.569E-04	1.922E-03	1.944E-02
Pb-210	U-238	1.000E+00	0.000E+00	0.000E+00	1.714E-14	2.015E-12	1.447E-10	1.247E-08	5.036E-07	1.844E-05
Pb-210	S(j):		1.500E+01	1.500E+01	1.499E+01	1.497E+01	1.491E+01	1.470E+01	1.411E+01	1.222E+01
0Ra-226	Ra-226	1.000E+00	1.500E+01	1.499E+01	1.497E+01	1.490E+01	1.472E+01	1.407E+01	1.239E+01	7.923E+00
Ra-226	Th-230	1.000E+00	0.000E+00	6.495E-03	1.947E-02	6.471E-02	1.925E-01	6.228E-01	1.717E+00	4.275E+00
Ra-226	U-234	1.000E+00	0.000E+00	2.924E-08	2.630E-07	2.915E-06	2.605E-05	2.823E-04	2.369E-03	2.064E-02
Ra-226	U-238	1.000E+00	0.000E+00	2.649E-14	7.441E-13	2.755E-11	7.392E-10	2.678E-08	6.789E-07	2.021E-05
Ra-226	S(j):		1.500E+01	1.500E+01	1.499E+01	1.497E+01	1.491E+01	1.470E+01	1.411E+01	1.222E+01
0Ra-228	Ra-228	1.000E+00	2.250E+01	1.994E+01	1.566E+01	6.726E+00	6.011E-01	1.282E-04	4.164E-15	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	2.555E+00	6.824E+00	1.573E+01	2.176E+01	2.204E+01	2.116E+01	1.833E+01
Ra-228	S(j):		2.250E+01	2.250E+01	2.249E+01	2.245E+01	2.236E+01	2.204E+01	2.116E+01	1.833E+01
0Th-228	Ra-228	1.000E+00	0.000E+00	6.418E+00	1.211E+01	9.181E+00	9.001E-01	1.922E-04	6.241E-15	0.000E+00
Th-228	Th-228	1.000E+00	2.250E+01	1.566E+01	7.583E+00	5.995E-01	4.256E-04	4.056E-15	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	4.194E-01	2.796E+00	1.267E+01	2.146E+01	2.204E+01	2.116E+01	1.833E+01
Th-228	S(j):		2.250E+01	2.250E+01	2.249E+01	2.245E+01	2.236E+01	2.204E+01	2.116E+01	1.833E+01
0Th-230	Th-230	1.000E+00	1.500E+01	1.500E+01	1.499E+01	1.497E+01	1.490E+01	1.468E+01	1.407E+01	1.211E+01
Th-230	U-234	1.000E+00	0.000E+00	1.350E-04	4.048E-04	1.347E-03	4.025E-03	1.322E-02	3.802E-02	1.093E-01
Th-230	U-238	1.000E+00	0.000E+00	1.914E-10	1.722E-09	1.910E-08	1.712E-07	1.874E-06	1.618E-05	1.553E-04
Th-230	S(j):		1.500E+01	1.500E+01	1.499E+01	1.497E+01	1.491E+01	1.470E+01	1.411E+01	1.222E+01
0Th-232	Th-232	1.000E+00	2.250E+01	2.250E+01	2.249E+01	2.245E+01	2.236E+01	2.204E+01	2.116E+01	1.833E+01
0U-234	U-234	1.000E+00	1.500E+01	1.500E+01	1.499E+01	1.497E+01	1.491E+01	1.469E+01	1.409E+01	1.218E+01
U-234	U-238	1.000E+00	0.000E+00	4.252E-05	1.275E-04	4.244E-04	1.268E-03	4.166E-03	1.199E-02	3.459E-02
U-234	S(j):		1.500E+01	1.500E+01	1.499E+01	1.497E+01	1.491E+01	1.470E+01	1.411E+01	1.222E+01
0U-238	U-238	1.000E+00	1.500E+01	1.500E+01	1.499E+01	1.497E+01	1.491E+01	1.470E+01	1.411E+01	1.222E+01

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

CBRDBWS

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

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				

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D-5    Ra-228+D , fish                                    5.000E+01   5.000E+01   BIOFAC( 3,1)
D-5    Ra-228+D , crustacea and mollusks                  2.500E+02   2.500E+02   BIOFAC( 3,2)
D-5
D-5    Th-228+D , fish                                    1.000E+02   1.000E+02   BIOFAC( 4,1)
D-5    Th-228+D , crustacea and mollusks                  5.000E+02   5.000E+02   BIOFAC( 4,2)
D-5
D-5    Th-230   , fish                                    1.000E+02   1.000E+02   BIOFAC( 5,1)
D-5    Th-230   , crustacea and mollusks                  5.000E+02   5.000E+02   BIOFAC( 5,2)
D-5
D-5    Th-232   , fish                                    1.000E+02   1.000E+02   BIOFAC( 6,1)
D-5    Th-232   , crustacea and mollusks                  5.000E+02   5.000E+02   BIOFAC( 6,2)
D-5
D-5    U-234    , fish                                    1.000E+01   1.000E+01   BIOFAC( 7,1)
D-5    U-234    , crustacea and mollusks                  6.000E+01   6.000E+01   BIOFAC( 7,2)
D-5
D-5    U-238+D  , fish                                    1.000E+01   1.000E+01   BIOFAC( 8,1)
D-5    U-238+D  , crustacea and mollusks                  6.000E+01   6.000E+01   BIOFAC( 8,2)
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Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.500E+01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.500E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	2.250E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	2.250E+01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.500E+01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	2.250E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	1.500E+01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				

R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-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)	1.141E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

Pb-210	1.500E+01
Ra-226	1.500E+01
Ra-228	2.250E+01
Th-228	2.250E+01
Th-230	1.500E+01
Th-232	2.250E+01
U-234	1.500E+01
U-238	1.500E+01

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	6.103E+00	6.102E+00	6.100E+00	6.091E+00	6.066E+00	5.979E+00	5.739E+00	4.972E+00
M(t):	2.034E-01	2.034E-01	2.033E-01	2.030E-01	2.022E-01	1.993E-01	1.913E-01	1.657E-01

0Maximum TDOSE(t): 6.103E+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
0 Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.010E-03	0.0002	1.615E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.471E-02	0.0073
Ra-226	1.805E+00	0.2957	6.331E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.004E-03	0.0015
Ra-228	1.743E+00	0.2856	6.165E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.388E-02	0.0023
Th-228	2.071E+00	0.3392	3.069E-02	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.351E-03	0.0010
Th-230	5.898E-04	0.0001	2.305E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.425E-03	0.0006
Th-232	9.981E-02	0.0164	1.742E-01	0.0285	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E-02	0.0043
U-234	6.668E-05	0.0000	9.332E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.768E-03	0.0003
U-238	2.211E-02	0.0036	8.342E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.680E-03	0.0003
Total	5.742E+00	0.9408	2.540E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E-01	0.0176

0

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
0 Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.734E-02	0.0078
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.814E+00	0.2973
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.763E+00	0.2889
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.108E+00	0.3453
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.706E-02	0.0044
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-01	0.0492
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	1.117E-02	0.0018
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	3.213E-02	0.0053
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	6.103E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	9.791E-04	0.0002	1.565E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.334E-02	0.0071
Ra-226	1.803E+00	0.2956	6.820E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-02	0.0017
Ra-228	2.136E+00	0.3500	1.422E-02	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.411E-02	0.0023
Th-228	1.441E+00	0.2361	2.136E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.420E-03	0.0007
Th-230	1.371E-03	0.0002	2.304E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.428E-03	0.0006
Th-232	3.363E-01	0.0551	1.754E-01	0.0287	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.810E-02	0.0046
U-234	6.668E-05	0.0000	9.330E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.767E-03	0.0003
U-238	2.211E-02	0.0036	8.340E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.680E-03	0.0003
Total	5.741E+00	0.9408	2.539E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E-01	0.0176

0

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

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.588E-02	0.0075
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.815E+00	0.2974
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.164E+00	0.3546
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.467E+00	0.2404
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.784E-02	0.0046
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.398E-01	0.0885
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	1.116E-02	0.0018
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	3.213E-02	0.0053
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	6.102E+00	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	9.197E-04	0.0002	1.470E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.071E-02	0.0067
Ra-226	1.801E+00	0.2953	7.754E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E-02	0.0021
Ra-228	2.328E+00	0.3816	2.081E-02	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-02	0.0021
Th-228	6.978E-01	0.1144	1.034E-02	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.140E-03	0.0004
Th-230	2.932E-03	0.0005	2.303E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.437E-03	0.0006
Th-232	8.857E-01	0.1452	1.797E-01	0.0295	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.139E-02	0.0051
U-234	6.669E-05	0.0000	9.326E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.767E-03	0.0003
U-238	2.210E-02	0.0036	8.337E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.679E-03	0.0003
Total	5.739E+00	0.9408	2.538E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E-01	0.0176

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.310E-02	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.815E+00	0.2976
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.362E+00	0.3872
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.103E-01	0.1165
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.940E-02	0.0048
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E+00	0.1798
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	1.116E-02	0.0018
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	3.211E-02	0.0053
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	6.100E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.388E-04	0.0001	1.181E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.270E-02	0.0054
Ra-226	1.793E+00	0.2944	1.059E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.084E-02	0.0034
Ra-228	1.366E+00	0.2243	1.437E-02	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.741E-03	0.0011
Th-228	5.517E-02	0.0091	8.177E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.692E-04	0.0000
Th-230	8.374E-03	0.0014	2.300E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.484E-03	0.0006
Th-232	2.484E+00	0.4079	1.954E-01	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.964E-02	0.0065
U-234	6.695E-05	0.0000	9.314E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-03	0.0003
U-238	2.207E-02	0.0036	8.325E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.677E-03	0.0003
Total	5.730E+00	0.9408	2.535E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-01	0.0176

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.462E-02	0.0057
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.815E+00	0.2980
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.387E+00	0.2277
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.615E-02	0.0092
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.486E-02	0.0057
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.720E+00	0.4465
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	1.115E-02	0.0018
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	3.207E-02	0.0053
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	6.091E+00	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	3.952E-04	0.0001	6.317E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.749E-02	0.0029
Ra-226	1.771E+00	0.2920	1.587E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.558E-02	0.0059
Ra-228	1.294E-01	0.0213	1.392E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.249E-04	0.0001
Th-228	3.936E-05	0.0000	5.804E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.201E-07	0.0000
Th-230	2.375E-02	0.0039	2.291E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.719E-03	0.0006
Th-232	3.760E+00	0.6199	2.083E-01	0.0343	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.573E-02	0.0075
U-234	6.956E-05	0.0000	9.280E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.758E-03	0.0003
U-238	2.198E-02	0.0036	8.291E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.670E-03	0.0003
Total	5.707E+00	0.9408	2.524E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.066E-01	0.0176

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.852E-02	0.0031
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.808E+00	0.2981

Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.314E-01	0.0217
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.986E-05	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.038E-02	0.0083
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.014E+00	0.6618
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	1.111E-02	0.0018
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	3.194E-02	0.0053
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	6.066E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	4.422E-05	0.0000	7.068E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.957E-03	0.0003
Ra-226	1.694E+00	0.2833	2.059E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.900E-02	0.0082
Ra-228	2.762E-05	0.0000	2.972E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.333E-07	0.0000
Th-228	3.732E-16	0.0000	5.532E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-18	0.0000
Th-230	7.553E-02	0.0126	2.263E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.018E-03	0.0008
Th-232	3.834E+00	0.6412	2.067E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.569E-02	0.0076
U-234	9.981E-05	0.0000	9.160E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.735E-03	0.0003
U-238	2.166E-02	0.0036	8.175E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.647E-03	0.0003
Total	5.626E+00	0.9408	2.488E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-01	0.0176

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.072E-03	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.745E+00	0.2918
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.805E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.799E-16	0.0000
Th-230	0.000E+00	0.0000	0.000E+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-01	0.0173
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.087E+00	0.6835
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	1.099E-02	0.0018
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	3.148E-02	0.0053
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.979E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	8.472E-08	0.0000	1.354E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.750E-06	0.0000
Ra-226	1.491E+00	0.2598	1.875E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.487E-02	0.0078
Ra-228	8.970E-16	0.0000	9.653E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.331E-18	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.072E-01	0.0361	2.185E-02	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.839E-03	0.0015
Th-232	3.680E+00	0.6412	1.984E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.386E-02	0.0076
U-234	3.492E-04	0.0001	8.826E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.677E-03	0.0003
U-238	2.079E-02	0.0036	7.852E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.581E-03	0.0003
Total	5.399E+00	0.9408	2.388E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-01	0.0176

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.970E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+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	0.2679
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.110E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.379E-01	0.0414
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.922E+00	0.6835
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	1.085E-02	0.0019
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	3.022E-02	0.0053
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.739E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	2.608E-17	0.0000	4.168E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.154E-15	0.0000
Ra-226	9.537E-01	0.1918	1.199E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.871E-02	0.0058
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	5.151E-01	0.1036	1.923E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.774E-02	0.0036
Th-232	3.188E+00	0.6412	1.719E-01	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.799E-02	0.0076
U-234	2.543E-03	0.0005	7.751E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.531E-03	0.0003

U-238	1.801E-02	0.0036	6.817E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.373E-03	0.0003
Total	4.677E+00	0.9408	2.069E-01	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.735E-02	0.0176

0

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

0

0

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.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.222E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.836E-01	0.1978
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.521E-01	0.1110
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.398E+00	0.6835
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	1.183E-02	0.0024
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	2.620E-02	0.0053
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	4.972E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	3.156E-03	3.059E-03	2.873E-03	2.308E-03	1.234E-03	1.381E-04	2.646E-07	8.146E-17
0Ra-226	Ra-226	1.000E+00	1.209E-01	1.208E-01	1.207E-01	1.201E-01	1.186E-01	1.134E-01	9.983E-02	6.386E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	1.458E-04	3.298E-04	8.884E-04	1.936E-03	2.909E-03	2.683E-03	1.717E-03
Ra-226	DSR(j)		1.209E-01	1.210E-01	1.210E-01	1.210E-01	1.205E-01	1.163E-01	1.025E-01	6.558E-02
0Ra-228	Ra-228	1.000E+00	6.111E-02	5.416E-02	4.254E-02	1.827E-02	1.632E-03	3.482E-07	1.131E-17	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	4.202E-02	6.242E-02	4.338E-02	4.209E-03	8.984E-07	2.918E-17	0.000E+00
Ra-228	DSR(j)		6.111E-02	9.618E-02	1.050E-01	6.165E-02	5.841E-03	1.247E-06	4.049E-17	0.000E+00
0Th-228	Th-228	1.000E+00	9.367E-02	6.519E-02	3.157E-02	2.496E-03	1.772E-06	1.688E-17	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	1.778E-03	1.777E-03	1.777E-03	1.774E-03	1.766E-03	1.740E-03	1.667E-03	1.435E-03
Th-230	Ra-226	1.000E+00	0.000E+00	7.854E-05	1.831E-04	5.477E-04	1.577E-03	5.045E-03	1.386E-02	3.448E-02
Th-230	Pb-210	1.000E+00	0.000E+00	4.950E-08	2.563E-07	2.134E-06	1.483E-05	9.321E-05	3.301E-04	8.902E-04
Th-230	DSR(j)		1.778E-03	1.856E-03	1.960E-03	2.324E-03	3.359E-03	6.878E-03	1.586E-02	3.681E-02
0Th-232	Th-232	1.000E+00	8.872E-03	8.870E-03	8.866E-03	8.854E-03	8.817E-03	8.692E-03	8.342E-03	7.227E-03
Th-232	Ra-228	1.000E+00	0.000E+00	1.069E-02	2.229E-02	4.646E-02	6.283E-02	6.355E-02	6.099E-02	5.284E-02
Th-232	Th-228	1.000E+00	0.000E+00	4.428E-03	1.760E-02	6.555E-02	1.068E-01	1.094E-01	1.050E-01	9.096E-02
Th-232	DSR(j)		8.872E-03	2.399E-02	4.875E-02	1.209E-01	1.784E-01	1.816E-01	1.743E-01	1.510E-01
0U-234	U-234	1.000E+00	7.444E-04	7.442E-04	7.439E-04	7.428E-04	7.398E-04	7.291E-04	6.994E-04	6.047E-04
U-234	Th-230	1.000E+00	0.000E+00	2.400E-08	5.598E-08	1.677E-07	4.850E-07	1.575E-06	4.514E-06	1.297E-05
U-234	Ra-226	1.000E+00	0.000E+00	5.499E-10	2.905E-09	2.592E-08	2.170E-07	2.299E-06	1.916E-05	1.666E-04
U-234	Pb-210	1.000E+00	0.000E+00	2.396E-13	2.753E-12	6.914E-11	1.459E-09	3.394E-08	4.122E-07	4.158E-06
U-234	DSR(j)		7.444E-04	7.443E-04	7.440E-04	7.430E-04	7.405E-04	7.330E-04	7.235E-04	7.884E-04
0U-238	U-238	1.000E+00	2.142E-03	2.142E-03	2.141E-03	2.138E-03	2.129E-03	2.099E-03	2.014E-03	1.745E-03
U-238	U-234	1.000E+00	0.000E+00	3.165E-09	7.382E-09	2.211E-08	6.397E-08	2.078E-07	5.961E-07	1.717E-06
U-238	Th-230	1.000E+00	0.000E+00	5.292E-14	2.796E-13	2.498E-12	2.097E-11	2.244E-10	1.924E-09	1.843E-08
U-238	Ra-226	1.000E+00	0.000E+00	8.241E-16	9.728E-15	2.577E-13	6.264E-12	2.191E-10	5.500E-09	1.632E-07
U-238	Pb-210	1.000E+00	0.000E+00	1.771E-19	6.877E-18	5.239E-16	3.295E-14	2.713E-12	1.082E-10	3.946E-09
U-238	DSR(j)		2.142E-03	2.142E-03	2.141E-03	2.138E-03	2.129E-03	2.099E-03	2.015E-03	1.747E-03

*Branch Fraction is the cumulative factor for the j'th 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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	9.506E+03	9.808E+03	1.044E+04	1.300E+04	2.430E+04	2.172E+05	1.134E+08	*7.631E+13
Ra-226	2.480E+02	2.480E+02	2.479E+02	2.479E+02	2.489E+02	2.579E+02	2.926E+02	4.575E+02
Ra-228	3.828E+02	3.119E+02	2.858E+02	4.866E+02	5.136E+03	2.407E+07	*2.726E+14	*2.726E+14
Th-228	3.203E+02	4.602E+02	9.503E+02	1.202E+04	1.693E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	1.663E+04	1.616E+04	1.531E+04	1.291E+04	8.932E+03	4.361E+03	1.892E+03	8.151E+02
Th-232	2.247E+03	1.250E+03	6.154E+02	2.482E+02	1.681E+02	1.652E+02	1.721E+02	1.986E+02
U-234	4.030E+04	4.031E+04	4.032E+04	4.037E+04	4.052E+04	4.093E+04	4.147E+04	3.805E+04
U-238	1.400E+04	1.401E+04	1.401E+04	1.403E+04	1.409E+04	1.429E+04	1.489E+04	1.717E+04

*At specific activity limit

0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	1.500E+01	0.000E+00	3.156E-03	9.506E+03	3.156E-03	9.506E+03
Ra-226	1.500E+01	7.61 ñ 0.02	1.210E-01	2.479E+02	1.209E-01	2.480E+02
Ra-228	2.250E+01	2.712 ñ 0.005	1.051E-01	2.853E+02	7.838E-02	3.828E+02
Th-228	2.250E+01	0.000E+00	9.367E-02	3.203E+02	9.367E-02	3.203E+02
Th-230	1.500E+01	1.000E+03	3.681E-02	8.151E+02	1.804E-03	1.663E+04
Th-232	2.250E+01	54.3 ñ 0.1	1.830E-01	1.639E+02	1.335E-02	2.247E+03
U-234	1.500E+01	1.000E+03	7.884E-04	3.805E+04	7.444E-04	4.030E+04
U-238	1.500E+01	0.000E+00	2.142E-03	1.400E+04	2.142E-03	1.400E+04

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

```
 Pb-210   Pb-210   1.000E+00    4.734E-02 4.588E-02 4.310E-02 3.462E-02 1.852E-02 2.072E-03 3.970E-06 1.222E-15
 Pb-210   Ra-226   1.000E+00    7.394E-04 2.187E-03 4.947E-03 1.333E-02 2.904E-02 4.363E-02 4.025E-02 2.575E-02
 Pb-210   Th-230   1.000E+00    1.070E-07 7.425E-07 3.845E-06 3.200E-05 2.224E-04 1.398E-03 4.951E-03 1.335E-02
 Pb-210   U-234    1.000E+00    2.413E-13 3.594E-12 4.130E-11 1.037E-09 2.188E-08 5.091E-07 6.183E-06 6.236E-05
 Pb-210   U-238    1.000E+00    0.000E+00 2.657E-18 1.032E-16 7.858E-15 4.942E-13 4.069E-11 1.623E-09 5.919E-08
 Pb-210   DOSE(j):             4.808E-02 4.807E-02 4.805E-02 4.798E-02 4.778E-02 4.710E-02 4.521E-02 3.916E-02
0Ra-226   Ra-226   1.000E+00    1.813E+00 1.812E+00 1.810E+00 1.802E+00 1.779E+00 1.701E+00 1.497E+00 9.579E-01
 Ra-226   Th-230   1.000E+00    3.928E-04 1.178E-03 2.746E-03 8.215E-03 2.366E-02 7.568E-02 2.079E-01 5.172E-01
 Ra-226   U-234    1.000E+00    1.179E-09 8.249E-09 4.357E-08 3.888E-07 3.256E-06 3.448E-05 2.874E-04 2.499E-03
 Ra-226   U-238    1.000E+00    7.044E-16 1.236E-14 1.459E-13 3.865E-12 9.395E-11 3.287E-09 8.250E-08 2.448E-06
 Ra-226   DOSE(j):             1.814E+00 1.814E+00 1.813E+00 1.810E+00 1.803E+00 1.777E+00 1.706E+00 1.478E+00
0Ra-228   Ra-228   1.000E+00    1.375E+00 1.219E+00 9.571E-01 4.110E-01 3.673E-02 7.835E-06 2.545E-16 0.000E+00
 Ra-228   Th-232   1.000E+00    9.453E-02 2.406E-01 5.015E-01 1.045E+00 1.414E+00 1.430E+00 1.372E+00 1.189E+00
 Ra-228   DOSE(j):             1.459E+00 1.459E+00 1.459E+00 1.456E+00 1.450E+00 1.430E+00 1.372E+00 1.189E+00
0Th-228   Ra-228   1.000E+00    3.885E-01 9.455E-01 1.405E+00 9.762E-01 9.469E-02 2.021E-05 6.565E-16 0.000E+00
 Th-228   Th-228   1.000E+00    2.108E+00 1.467E+00 7.103E-01 5.615E-02 3.986E-05 3.799E-16 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    1.624E-02 9.964E-02 3.959E-01 1.475E+00 2.402E+00 2.461E+00 2.362E+00 2.047E+00
 Th-228   DOSE(j):             2.512E+00 2.512E+00 2.511E+00 2.507E+00 2.497E+00 2.461E+00 2.362E+00 2.047E+00
0Th-230   Th-230   1.000E+00    2.667E-02 2.666E-02 2.665E-02 2.661E-02 2.650E-02 2.610E-02 2.501E-02 2.153E-02
 Th-230   U-234    1.000E+00    1.200E-07 3.600E-07 8.397E-07 2.515E-06 7.276E-06 2.362E-05 6.771E-05 1.945E-04
 Th-230   U-238    1.000E+00    1.134E-13 7.938E-13 4.194E-12 3.747E-11 3.146E-10 3.366E-09 2.886E-08 2.764E-07
 Th-230   DOSE(j):             2.667E-02 2.666E-02 2.665E-02 2.661E-02 2.650E-02 2.613E-02 2.508E-02 2.172E-02
0Th-232   Th-232   1.000E+00    1.996E-01 1.996E-01 1.995E-01 1.992E-01 1.984E-01 1.956E-01 1.877E-01 1.626E-01
0U-234    U-234    1.000E+00    1.117E-02 1.116E-02 1.116E-02 1.114E-02 1.110E-02 1.094E-02 1.049E-02 9.070E-03
 U-234    U-238    1.000E+00    1.583E-08 4.747E-08 1.107E-07 3.317E-07 9.595E-07 3.116E-06 8.941E-06 2.576E-05
 U-234    DOSE(j):             1.117E-02 1.116E-02 1.116E-02 1.114E-02 1.110E-02 1.094E-02 1.050E-02 9.096E-03
0U-238    U-238    1.000E+00    3.213E-02 3.213E-02 3.211E-02 3.207E-02 3.194E-02 3.148E-02 3.022E-02 2.618E-02

 BRF(i) is the branch fraction of the parent nuclide.
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 Summary : CBRDBWS Cabot Reading BW Slope                        File: CBRDBWS.RAD

                                Individual Nuclide Soil Concentration
                              Parent Nuclide and Branch Fraction Indicated
0Nuclide Parent   BRF(i)                                  S(j,t), pCi/g
   (j)     (i)              t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210   Pb-210   1.000E+00    1.500E+01 1.454E+01 1.366E+01 1.097E+01 5.867E+00 6.566E-01 1.258E-03 3.872E-13
 Pb-210   Ra-226   1.000E+00    0.000E+00 4.589E-01 1.334E+00 3.990E+00 8.973E+00 1.361E+01 1.256E+01 8.035E+00
 Pb-210   Th-230   1.000E+00    0.000E+00 9.992E-05 8.804E-04 9.097E-03 6.743E-02 4.333E-01 1.542E+00 4.164E+00
 Pb-210   U-234    1.000E+00    0.000E+00 3.006E-10 7.987E-09 2.800E-07 6.519E-06 1.569E-04 1.922E-03 1.944E-02
 Pb-210   U-238    1.000E+00    0.000E+00 0.000E+00 1.714E-14 2.015E-12 1.447E-10 1.247E-08 5.036E-07 1.844E-05
 Pb-210   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Ra-226   Ra-226   1.000E+00    1.500E+01 1.499E+01 1.497E+01 1.490E+01 1.472E+01 1.407E+01 1.239E+01 7.923E+00
 Ra-226   Th-230   1.000E+00    0.000E+00 6.495E-03 1.947E-02 6.471E-02 1.925E-01 6.228E-01 1.717E+00 4.275E+00
 Ra-226   U-234    1.000E+00    0.000E+00 2.924E-08 2.630E-07 2.915E-06 2.605E-05 2.823E-04 2.369E-03 2.064E-02
 Ra-226   U-238    1.000E+00    0.000E+00 2.649E-14 7.441E-13 2.755E-11 7.392E-10 2.678E-08 6.789E-07 2.021E-05
 Ra-226   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Ra-228   Ra-228   1.000E+00    2.250E+01 1.994E+01 1.566E+01 6.726E+00 6.011E-01 1.282E-04 4.164E-15 0.000E+00
 Ra-228   Th-232   1.000E+00    0.000E+00 2.555E+00 6.824E+00 1.573E+01 2.176E+01 2.204E+01 2.116E+01 1.833E+01
 Ra-228   S(j):                2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0Th-228   Ra-228   1.000E+00    0.000E+00 6.418E+00 1.211E+01 9.181E+00 9.001E-01 1.922E-04 6.241E-15 0.000E+00
 Th-228   Th-228   1.000E+00    2.250E+01 1.566E+01 7.583E+00 5.995E-01 4.256E-04 4.056E-15 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    0.000E+00 4.194E-01 2.796E+00 1.267E+01 2.146E+01 2.204E+01 2.116E+01 1.833E+01
 Th-228   S(j):                2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0Th-230   Th-230   1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.490E+01 1.468E+01 1.407E+01 1.211E+01
 Th-230   U-234    1.000E+00    0.000E+00 1.350E-04 4.048E-04 1.347E-03 4.025E-03 1.322E-02 3.802E-02 1.093E-01
 Th-230   U-238    1.000E+00    0.000E+00 1.914E-10 1.722E-09 1.910E-08 1.712E-07 1.874E-06 1.618E-05 1.553E-04
 Th-230   S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0Th-232   Th-232   1.000E+00    2.250E+01 2.250E+01 2.249E+01 2.245E+01 2.236E+01 2.204E+01 2.116E+01 1.833E+01
0U-234    U-234    1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.469E+01 1.409E+01 1.218E+01
 U-234    U-238    1.000E+00    0.000E+00 4.252E-05 1.275E-04 4.244E-04 1.268E-03 4.166E-03 1.199E-02 3.459E-02
 U-234    S(j):                1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01
0U-238    U-238    1.000E+00    1.500E+01 1.500E+01 1.499E+01 1.497E+01 1.491E+01 1.470E+01 1.411E+01 1.222E+01

 BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time =  249.09 seconds
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□
1RESRAD, Version 5.91 T« Limit = 0.5 year 03/08/2000 10:19 Page 1
Summary : CBRDBWT Cabot Reading BW Top File: CBRDBWT.RAD

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

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

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

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				

D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	7.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	5.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	7.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	5.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	5.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	6.500E+02	1.000E+02	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				

R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.500E+02	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	6.500E+02	5.000E+01	---	DCNUCC(8)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.051E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.220E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	1.900E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	1.027E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	0.000E+00	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	3.650E+01	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
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

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	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

Pb-210	5.000E+00
Ra-226	5.000E+00
Ra-228	7.500E+00
Th-228	7.500E+00
Th-230	5.000E+00
Th-232	7.500E+00
U-234	5.000E+00
U-238	5.000E+00

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.976E+00	3.975E+00	3.974E+00	3.968E+00	3.952E+00	3.895E+00	3.739E+00	3.239E+00
M(t):	1.325E-01	1.325E-01	1.325E-01	1.323E-01	1.317E-01	1.298E-01	1.246E-01	1.080E-01

0Maximum TDOSE(t): 3.976E+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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.759E-04	0.0001	2.423E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.342E-01	0.0337
Ra-226	1.029E+00	0.2587	9.497E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.702E-02	0.0068
Ra-228	9.938E-01	0.2500	9.249E-03	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.165E-02	0.0105
Th-228	1.180E+00	0.2969	4.604E-02	0.0116	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.905E-02	0.0048
Th-230	3.362E-04	0.0001	3.457E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-02	0.0026
Th-232	5.689E-02	0.0143	2.613E-01	0.0657	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.924E-02	0.0199
U-234	3.801E-05	0.0000	1.400E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.304E-03	0.0013
U-238	1.260E-02	0.0032	1.251E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.041E-03	0.0013
Total	3.273E+00	0.8233	3.810E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-01	0.0809

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-01	0.0345
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.057E+00	0.2658
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.045E+00	0.2628
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.245E+00	0.3132
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.518E-02	0.0114
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.974E-01	0.1000
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	1.934E-02	0.0049
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	3.016E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.976E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.581E-04	0.0001	2.348E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.300E-01	0.0327
Ra-226	1.028E+00	0.2586	1.023E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.110E-02	0.0078
Ra-228	1.217E+00	0.3063	2.133E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.235E-02	0.0107
Th-228	8.214E-01	0.2066	3.204E-02	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.326E-02	0.0033
Th-230	7.816E-04	0.0002	3.457E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-02	0.0026
Th-232	1.917E-01	0.0482	2.631E-01	0.0662	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.430E-02	0.0212
U-234	3.801E-05	0.0000	1.400E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.303E-03	0.0013
U-238	1.260E-02	0.0032	1.251E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.040E-03	0.0013
Total	3.273E+00	0.8233	3.810E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-01	0.0809

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.329E-01	0.0334
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.060E+00	0.2667
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E+00	0.3223
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.667E-01	0.2180
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.563E-02	0.0115
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.392E-01	0.1356
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	1.934E-02	0.0049
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	3.015E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.975E+00	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	5.243E-04	0.0001	2.205E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.221E-01	0.0307
Ra-226	1.027E+00	0.2584	1.163E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.889E-02	0.0098
Ra-228	1.327E+00	0.3339	3.121E-02	0.0079	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.924E-02	0.0099
Th-228	3.978E-01	0.1001	1.552E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.422E-03	0.0016
Th-230	1.671E-03	0.0004	3.455E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E-02	0.0026
Th-232	5.049E-01	0.1271	2.696E-01	0.0679	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.419E-02	0.0237
U-234	3.802E-05	0.0000	1.399E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.301E-03	0.0013
U-238	1.260E-02	0.0032	1.251E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.038E-03	0.0013
Total	3.271E+00	0.8233	3.808E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.215E-01	0.0809

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+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-01	0.0314
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.067E+00	0.2685
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.397E+00	0.3517
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.197E-01	0.1056
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.653E-02	0.0117
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.688E-01	0.2186
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	1.933E-02	0.0049
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	3.014E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.974E+00	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.212E-04	0.0001	1.772E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.811E-02	0.0247
Ra-226	1.022E+00	0.2576	1.588E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.253E-02	0.0158
Ra-228	7.787E-01	0.1963	2.155E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.023E-02	0.0051
Th-228	3.145E-02	0.0079	1.227E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.077E-04	0.0001
Th-230	4.774E-03	0.0012	3.450E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.045E-02	0.0026
Th-232	1.416E+00	0.3569	2.931E-01	0.0739	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-01	0.0300
U-234	3.817E-05	0.0000	1.397E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.294E-03	0.0013
U-238	1.258E-02	0.0032	1.249E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.031E-03	0.0013
Total	3.267E+00	0.8233	3.802E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.211E-01	0.0809

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.003E-01	0.0253
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.086E+00	0.2738
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.205E-01	0.2068
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.318E-02	0.0084
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.973E-02	0.0125
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.828E+00	0.4608
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	1.930E-02	0.0049
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	3.010E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.968E+00	1.0000

0*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

0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.253E-04	0.0001	9.476E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.247E-02	0.0133
Ra-226	1.010E+00	0.2555	2.381E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.068E-01	0.0270
Ra-228	7.377E-02	0.0187	2.089E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.875E-03	0.0005
Th-228	2.232E-05	0.0000	8.707E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.604E-07	0.0000
Th-230	1.354E-02	0.0034	3.437E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-02	0.0028
Th-232	2.144E+00	0.5424	3.125E-01	0.0791	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.372E-01	0.0347
U-234	3.965E-05	0.0000	1.392E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.274E-03	0.0013
U-238	1.253E-02	0.0032	1.244E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.011E-03	0.0013
Total	3.253E+00	0.8233	3.787E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.198E-01	0.0809

0

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

0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.365E-02	0.0136
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.119E+00	0.2831

Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.773E-02	0.0197
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.355E-05	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.907E-02	0.0149
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.593E+00	0.6563
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	1.923E-02	0.0049
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	2.998E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.952E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	2.521E-05	0.0000	1.060E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.872E-03	0.0015
Ra-226	9.656E-01	0.2479	3.088E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-01	0.0377
Ra-228	1.574E-05	0.0000	4.459E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.001E-07	0.0000
Th-228	2.128E-16	0.0000	8.299E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.435E-18	0.0000
Th-230	4.306E-02	0.0111	3.395E-02	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.505E-02	0.0039
Th-232	2.186E+00	0.5611	3.101E-01	0.0796	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-01	0.0352
U-234	5.690E-05	0.0000	1.374E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.206E-03	0.0013
U-238	1.235E-02	0.0032	1.226E-02	0.0031	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.940E-03	0.0013
Total	3.207E+00	0.8233	3.733E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.152E-01	0.0809

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.003E-03	0.0015
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E+00	0.2864
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.659E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.245E-16	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.206E-02	0.0236
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E+00	0.6759
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	1.900E-02	0.0049
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	2.955E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.895E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	4.829E-08	0.0000	2.032E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.125E-05	0.0000
Ra-226	8.499E-01	0.2273	2.813E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.346E-01	0.0360
Ra-228	5.113E-16	0.0000	1.448E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-17	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.181E-01	0.0316	3.278E-02	0.0088	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.652E-02	0.0071
Th-232	2.098E+00	0.5611	2.977E-01	0.0796	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.316E-01	0.0352
U-234	1.991E-04	0.0001	1.324E-02	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.031E-03	0.0013
U-238	1.185E-02	0.0032	1.178E-02	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.745E-03	0.0013
Total	3.078E+00	0.8233	3.583E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.025E-01	0.0809

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.150E-05	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.874E-01	0.2641
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.388E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.774E-01	0.0474
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.527E+00	0.6759
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	1.847E-02	0.0049
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	2.838E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	1.487E-17	0.0000	6.253E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.463E-15	0.0000
Ra-226	5.437E-01	0.1679	1.799E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.613E-02	0.0266
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.936E-01	0.0907	2.885E-02	0.0089	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.324E-02	0.0164
Th-232	1.817E+00	0.5611	2.579E-01	0.0796	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.140E-01	0.0352
U-234	1.450E-03	0.0004	1.163E-02	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.594E-03	0.0014

U-238	1.027E-02	0.0032	1.023E-02	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.119E-03	0.0013
Total	2.666E+00	0.8233	3.104E-01	0.0958	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-01	0.0809

0

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

0

Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.540E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.316E-01	0.1950
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.757E-01	0.1160
Th-232	0.000E-00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.189E+00	0.6759
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	1.767E-02	0.0055
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	2.461E-02	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.239E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.743E-02	2.658E-02	2.497E-02	2.006E-02	1.073E-02	1.201E-03	2.300E-06	7.080E-16
0Ra-226	Ra-226	1.000E+00	2.109E-01	2.108E-01	2.105E-01	2.096E-01	2.069E-01	1.979E-01	1.742E-01	1.114E-01
Ra-226	Pb-210	1.000E+00	0.000E+00	1.267E-03	2.867E-03	7.722E-03	1.683E-02	2.528E-02	2.332E-02	1.492E-02
Ra-226	DSR(j)		2.109E-01	2.120E-01	2.134E-01	2.173E-01	2.237E-01	2.231E-01	1.975E-01	1.263E-01
0Ra-228	Ra-228	1.000E+00	1.087E-01	9.632E-02	7.565E-02	3.249E-02	2.903E-03	6.194E-07	2.012E-17	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	7.450E-02	1.107E-01	7.691E-02	7.461E-03	1.593E-06	5.172E-17	0.000E+00
Ra-228	DSR(j)		1.087E-01	1.708E-01	1.863E-01	1.094E-01	1.036E-02	2.212E-06	7.184E-17	0.000E+00
0Th-228	Th-228	1.000E+00	1.661E-01	1.156E-01	5.597E-02	4.424E-03	3.141E-06	2.993E-17	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	8.991E-03	8.989E-03	8.985E-03	8.972E-03	8.934E-03	8.801E-03	8.432E-03	7.258E-03
Th-230	Ra-226	1.000E+00	0.000E+00	1.370E-04	3.194E-04	9.554E-04	2.752E-03	8.801E-03	2.418E-02	6.015E-02
Th-230	Pb-210	1.000E+00	0.000E+00	4.303E-07	2.228E-06	1.855E-05	1.289E-04	8.101E-04	2.869E-03	7.738E-03
Th-230	DSR(j)		8.991E-03	9.127E-03	9.307E-03	9.946E-03	1.181E-02	1.841E-02	3.548E-02	7.515E-02
0Th-232	Th-232	1.000E+00	4.503E-02	4.502E-02	4.500E-02	4.493E-02	4.475E-02	4.411E-02	4.234E-02	3.668E-02
Th-232	Ra-228	1.000E+00	0.000E+00	1.902E-02	3.964E-02	8.264E-02	1.118E-01	1.130E-01	1.085E-01	9.398E-02
Th-232	Th-228	1.000E+00	0.000E+00	7.851E-03	3.120E-02	1.162E-01	1.893E-01	1.939E-01	1.861E-01	1.612E-01
Th-232	DSR(j)		4.503E-02	7.189E-02	1.158E-01	2.438E-01	3.458E-01	3.511E-01	3.370E-01	2.919E-01
0U-234	U-234	1.000E+00	3.868E-03	3.867E-03	3.866E-03	3.860E-03	3.844E-03	3.788E-03	3.634E-03	3.142E-03
U-234	Th-230	1.000E+00	0.000E+00	1.214E-07	2.831E-07	8.480E-07	2.453E-06	7.964E-06	2.283E-05	6.557E-05
U-234	Ra-226	1.000E+00	0.000E+00	9.593E-10	5.067E-09	4.522E-08	3.786E-07	4.010E-06	3.342E-05	2.906E-04
U-234	Pb-210	1.000E+00	0.000E+00	2.083E-12	2.393E-11	6.010E-10	1.268E-08	2.950E-07	3.583E-06	3.614E-05
U-234	DSR(j)		3.868E-03	3.867E-03	3.866E-03	3.861E-03	3.847E-03	3.801E-03	3.694E-03	3.534E-03
0U-238	U-238	1.000E+00	6.032E-03	6.031E-03	6.028E-03	6.020E-03	5.995E-03	5.909E-03	5.672E-03	4.914E-03
U-238	U-234	1.000E+00	0.000E+00	1.645E-08	3.836E-08	1.149E-07	3.324E-07	1.080E-06	3.097E-06	8.924E-06
U-238	Th-230	1.000E+00	0.000E+00	2.676E-13	1.414E-12	1.263E-11	1.061E-10	1.135E-09	9.730E-09	9.318E-08
U-238	Ra-226	1.000E+00	0.000E+00	1.438E-15	1.697E-14	4.495E-13	1.093E-11	3.823E-10	9.595E-09	2.847E-07
U-238	Pb-210	1.000E+00	0.000E+00	1.540E-18	5.978E-17	4.553E-15	2.864E-13	2.358E-11	9.403E-10	3.430E-08
U-238	DSR(j)		6.032E-03	6.031E-03	6.028E-03	6.020E-03	5.995E-03	5.911E-03	5.675E-03	4.923E-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 = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	1.094E+03	1.128E+03	1.201E+03	1.495E+03	2.796E+03	2.499E+04	1.304E+07	*7.631E+13
Ra-226	1.420E+02	1.415E+02	1.406E+02	1.381E+02	1.341E+02	1.344E+02	1.519E+02	2.375E+02
Ra-228	2.154E+02	1.756E+02	1.610E+02	2.742E+02	2.895E+03	1.356E+07	*2.726E+14	*2.726E+14
Th-228	1.807E+02	2.596E+02	5.360E+02	6.781E+03	9.552E+06	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	3.320E+03	3.287E+03	3.223E+03	3.016E+03	2.539E+03	1.629E+03	8.455E+02	3.992E+02
Th-232	5.662E+02	4.173E+02	2.590E+02	1.231E+02	8.676E+01	8.545E+01	8.903E+01	1.028E+02
U-234	7.756E+03	7.757E+03	7.760E+03	7.770E+03	7.799E+03	7.893E+03	8.121E+03	8.488E+03
U-238	4.974E+03	4.975E+03	4.977E+03	4.984E+03	5.004E+03	5.076E+03	5.286E+03	6.094E+03

*At specific activity limit

0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	5.000E+00	0.000E+00	2.743E-02	1.094E+03	2.743E-02	1.094E+03
Ra-226	5.000E+00	56.8 ñ 0.1	2.259E-01	1.328E+02	2.113E-01	1.420E+02
Ra-228	7.500E+00	2.708 ñ 0.005	1.866E-01	1.607E+02	1.393E-01	2.154E+02
Th-228	7.500E+00	0.000E+00	1.661E-01	1.807E+02	1.661E-01	1.807E+02
Th-230	5.000E+00	1.000E+03	7.515E-02	3.992E+02	9.037E-03	3.320E+03
Th-232	7.500E+00	53.6 ñ 0.1	3.538E-01	8.479E+01	5.299E-02	5.662E+02
U-234	5.000E+00	0.000E+00	3.868E-03	7.756E+03	3.868E-03	7.756E+03
U-238	5.000E+00	0.000E+00	6.032E-03	4.974E+03	6.032E-03	4.974E+03

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

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 Pb-210   Pb-210   1.000E+00    1.371E-01 1.329E-01 1.249E-01 1.003E-01 5.365E-02 6.003E-03 1.150E-05 3.540E-15
 Pb-210   Ra-226   1.000E+00    2.142E-03 6.336E-03 1.433E-02 3.861E-02 8.415E-02 1.264E-01 1.166E-01 7.460E-02
 Pb-210   Th-230   1.000E+00    3.101E-07 2.151E-06 1.114E-05 9.273E-05 6.443E-04 4.051E-03 1.434E-02 3.869E-02
 Pb-210   U-234    1.000E+00    6.990E-13 1.041E-11 1.197E-10 3.005E-09 6.340E-08 1.475E-06 1.791E-05 1.807E-04
 Pb-210   U-238    1.000E+00    0.000E+00 7.698E-18 2.989E-16 2.277E-14 1.432E-12 1.179E-10 4.702E-09 1.715E-07
 Pb-210   DOSE(j):             1.393E-01 1.393E-01 1.392E-01 1.390E-01 1.384E-01 1.365E-01 1.310E-01 1.135E-01
0Ra-226   Ra-226   1.000E+00    1.055E+00 1.054E+00 1.053E+00 1.048E+00 1.035E+00 9.893E-01 8.708E-01 5.570E-01
 Ra-226   Th-230   1.000E+00    2.284E-04 6.850E-04 1.597E-03 4.777E-03 1.376E-02 4.401E-02 1.209E-01 3.007E-01
 Ra-226   U-234    1.000E+00    6.855E-10 4.797E-09 2.534E-08 2.261E-07 1.893E-06 2.005E-05 1.671E-04 1.453E-03
 Ra-226   U-238    1.000E+00    4.096E-16 7.188E-15 8.485E-14 2.248E-12 5.463E-11 1.911E-09 4.798E-08 1.423E-06
 Ra-226   DOSE(j):             1.055E+00 1.055E+00 1.054E+00 1.053E+00 1.048E+00 1.033E+00 9.918E-01 8.592E-01
0Ra-228   Ra-228   1.000E+00    8.151E-01 7.224E-01 5.674E-01 2.437E-01 2.178E-02 4.645E-06 1.509E-16 0.000E+00
 Ra-228   Th-232   1.000E+00    5.012E-02 1.427E-01 2.973E-01 6.198E-01 8.382E-01 8.477E-01 8.136E-01 7.048E-01
 Ra-228   DOSE(j):             8.652E-01 8.651E-01 8.647E-01 8.635E-01 8.599E-01 8.477E-01 8.136E-01 7.048E-01
0Th-228   Ra-228   1.000E+00    2.296E-01 5.587E-01 8.300E-01 5.768E-01 5.596E-02 1.194E-05 3.879E-16 0.000E+00
 Th-228   Th-228   1.000E+00    1.245E+00 8.667E-01 4.197E-01 3.318E-02 2.355E-05 2.245E-16 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    9.598E-03 5.888E-02 2.340E-01 8.715E-01 1.420E+00 1.454E+00 1.396E+00 1.209E+00
 Th-228   DOSE(j):             1.485E+00 1.484E+00 1.484E+00 1.482E+00 1.475E+00 1.454E+00 1.396E+00 1.209E+00
0Th-230   Th-230   1.000E+00    4.496E-02 4.495E-02 4.493E-02 4.486E-02 4.467E-02 4.400E-02 4.216E-02 3.629E-02
 Th-230   U-234    1.000E+00    2.023E-07 6.069E-07 1.415E-06 4.240E-06 1.227E-05 3.982E-05 1.141E-04 3.279E-04
 Th-230   U-238    1.000E+00    1.912E-13 1.338E-12 7.070E-12 6.316E-11 5.303E-10 5.674E-09 4.865E-08 4.659E-07
 Th-230   DOSE(j):             4.496E-02 4.495E-02 4.493E-02 4.486E-02 4.468E-02 4.404E-02 4.227E-02 3.662E-02
0Th-232   Th-232   1.000E+00    3.377E-01 3.376E-01 3.375E-01 3.370E-01 3.356E-01 3.308E-01 3.176E-01 2.751E-01
0U-234    U-234    1.000E+00    1.934E-02 1.934E-02 1.933E-02 1.930E-02 1.922E-02 1.894E-02 1.817E-02 1.571E-02
 U-234    U-238    1.000E+00    2.741E-08 8.223E-08 1.918E-07 5.745E-07 1.662E-06 5.398E-06 1.549E-05 4.462E-05
 U-234    DOSE(j):             1.934E-02 1.934E-02 1.933E-02 1.930E-02 1.922E-02 1.895E-02 1.819E-02 1.575E-02
0U-238    U-238    1.000E+00    3.016E-02 3.015E-02 3.014E-02 3.010E-02 2.997E-02 2.955E-02 2.836E-02 2.457E-02

 BRF(i) is the branch fraction of the parent nuclide.
1RESRAD, Version 5.91      T½ Limit = 0.5 year        03/08/2000  10:19  Page  22
 Summary : CBRDBWT  Cabot Reading BW Top                        File: CBRDBWT.RAD

                                Individual Nuclide Soil Concentration
                              Parent Nuclide and Branch Fraction Indicated
0Nuclide Parent   BRF(i)                                  S(j,t), pCi/g
   (j)     (i)              t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03

 Pb-210   Pb-210   1.000E+00    5.000E+00 4.846E+00 4.552E+00 3.657E+00 1.956E+00 2.189E-01 4.193E-04 1.291E-13
 Pb-210   Ra-226   1.000E+00    0.000E+00 1.530E-01 4.446E-01 1.330E+00 2.991E+00 4.535E+00 4.187E+00 2.678E+00
 Pb-210   Th-230   1.000E+00    0.000E+00 3.331E-05 2.935E-04 3.032E-03 2.248E-02 1.444E-01 5.140E-01 1.388E+00
 Pb-210   U-234    1.000E+00    0.000E+00 1.002E-10 2.662E-09 9.333E-08 2.173E-06 5.229E-05 6.407E-04 6.480E-03
 Pb-210   U-238    1.000E+00    0.000E+00 0.000E+00 5.714E-15 6.717E-13 4.822E-11 4.157E-09 1.679E-07 6.146E-06
 Pb-210   S(j):                5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Ra-226   Ra-226   1.000E+00    5.000E+00 4.997E+00 4.990E+00 4.968E+00 4.905E+00 4.691E+00 4.129E+00 2.641E+00
 Ra-226   Th-230   1.000E+00    0.000E+00 2.165E-03 6.490E-03 2.157E-02 6.416E-02 2.076E-01 5.722E-01 1.425E+00
 Ra-226   U-234    1.000E+00    0.000E+00 9.746E-09 8.765E-08 9.715E-07 8.682E-06 9.411E-05 7.895E-04 6.881E-03
 Ra-226   U-238    1.000E+00    0.000E+00 8.832E-15 2.480E-13 9.183E-12 2.464E-10 8.927E-09 2.263E-07 6.737E-06
 Ra-226   S(j):                5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Ra-228   Ra-228   1.000E+00    7.500E+00 6.647E+00 5.221E+00 2.242E+00 2.004E-01 4.274E-05 1.388E-15 0.000E+00
 Ra-228   Th-232   1.000E+00    0.000E+00 8.516E-01 2.275E+00 5.243E+00 7.254E+00 7.348E+00 7.053E+00 6.109E+00
 Ra-228   S(j):                7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0Th-228   Ra-228   1.000E+00    0.000E+00 2.139E+00 4.036E+00 3.060E+00 3.000E-01 6.405E-05 2.080E-15 0.000E+00
 Th-228   Th-228   1.000E+00    7.500E+00 5.219E+00 2.528E+00 1.998E-01 1.419E-04 1.352E-15 0.000E+00 0.000E+00
 Th-228   Th-232   1.000E+00    0.000E+00 1.398E-01 9.319E-01 4.224E+00 7.154E+00 7.348E+00 7.053E+00 6.109E+00
 Th-228   S(j):                7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0Th-230   Th-230   1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.989E+00 4.968E+00 4.894E+00 4.689E+00 4.036E+00
 Th-230   U-234    1.000E+00    0.000E+00 4.500E-05 1.349E-04 4.491E-04 1.342E-03 4.407E-03 1.267E-02 3.645E-02
 Th-230   U-238    1.000E+00    0.000E+00 6.379E-11 5.738E-10 6.367E-09 5.706E-08 6.248E-07 5.393E-06 5.177E-05
 Th-230   S(j):                5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0Th-232   Th-232   1.000E+00    7.500E+00 7.498E+00 7.495E+00 7.485E+00 7.454E+00 7.348E+00 7.053E+00 6.109E+00
0U-234    U-234    1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.897E+00 4.698E+00 4.061E+00
 U-234    U-238    1.000E+00    0.000E+00 1.417E-05 4.250E-05 1.415E-04 4.226E-04 1.389E-03 3.997E-03 1.153E-02
 U-234    S(j):                5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00
0U-238    U-238    1.000E+00    5.000E+00 4.999E+00 4.997E+00 4.990E+00 4.969E+00 4.899E+00 4.702E+00 4.073E+00

 BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time = 251.28 seconds
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RDGGRDN

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Dose Conversion Factor (and Related) Parameter Summary
File: 71622866.LIB

0 Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	3.450E-03	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	8.420E-04	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	8.420E-04	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	4.770E-05	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	4.770E-05	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	4.770E-05	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	1.120E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: 71622866.LIB

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	1.120E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				

D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	4.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.500E+01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.500E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	2.250E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	2.250E+01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	1.500E+01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	2.250E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	1.500E+01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.200E-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)	1.000E-03	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	0.000E+00	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)

R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.653E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.495E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.495E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.111E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.111E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.111E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.328E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.328E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.490E+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)	8.000E-03	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

R018	Fruits, vegetables and grain consumption (kg/yr)	1.270E+01	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	2.750E+00	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)	3.650E+01	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	0.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E+00	-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
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	513	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	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: 1000.00 square meters
Thickness: 4.00 meters
Cover Depth: 0.00 meters

Initial Soil Concentrations, pCi/g

Pb-210	1.500E+01
Ra-226	1.500E+01
Ra-228	2.250E+01
Th-228	2.250E+01
Th-230	1.500E+01
Th-232	2.250E+01
U-234	1.500E+01
U-238	1.500E+01

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.321E+01	1.321E+01	1.319E+01	1.314E+01	1.300E+01	1.253E+01	1.138E+01	9.130E+00
M(t):	4.405E-01	4.402E-01	4.397E-01	4.379E-01	4.333E-01	4.178E-01	3.794E-01	3.043E-01

0Maximum TDOSE(t): 1.321E+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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	6.684E-04	0.0001	1.633E-02	0.0012	0.000E+00	0.0000	5.737E+00	0.4341	0.000E+00	0.0000	0.000E+00	0.0000	3.134E-02	0.0024
Ra-226	1.205E+00	0.0912	6.402E-03	0.0005	0.000E+00	0.0000	3.480E-01	0.0263	0.000E+00	0.0000	0.000E+00	0.0000	6.311E-03	0.0005
Ra-228	1.163E+00	0.0880	6.236E-02	0.0047	0.000E+00	0.0000	4.057E-01	0.0307	0.000E+00	0.0000	0.000E+00	0.0000	9.729E-03	0.0007
Th-228	1.385E+00	0.1048	3.105E-01	0.0235	0.000E+00	0.0000	1.339E-02	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	4.453E-03	0.0003
Th-230	3.949E-04	0.0000	2.332E-01	0.0176	0.000E+00	0.0000	7.284E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.402E-03	0.0002
Th-232	6.660E-02	0.0050	1.762E+00	0.1334	0.000E+00	0.0000	7.754E-02	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	1.852E-02	0.0014
U-234	4.477E-05	0.0000	9.434E-02	0.0071	0.000E+00	0.0000	7.401E-02	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	1.239E-03	0.0001
U-238	1.476E-02	0.0011	8.434E-02	0.0064	0.000E+00	0.0000	7.035E-02	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	1.177E-03	0.0001
Total	3.836E+00	0.2903	2.570E+00	0.1945	0.000E+00	0.0000	6.733E+00	0.5095	0.000E+00	0.0000	0.000E+00	0.0000	7.517E-02	0.0057

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.785E+00	0.4378
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.566E+00	0.1185
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.641E+00	0.1242
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.713E+00	0.1297
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.432E-01	0.0184
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.925E+00	0.1457
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	1.696E-01	0.0128
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	1.706E-01	0.0129
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	1.321E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	6.475E-04	0.0000	1.582E-02	0.0012	0.000E+00	0.0000	5.557E+00	0.4208	0.000E+00	0.0000	0.000E+00	0.0000	3.036E-02	0.0023
Ra-226	1.203E+00	0.0911	6.892E-03	0.0005	0.000E+00	0.0000	5.223E-01	0.0396	0.000E+00	0.0000	0.000E+00	0.0000	7.260E-03	0.0005
Ra-228	1.425E+00	0.1079	1.438E-01	0.0109	0.000E+00	0.0000	3.635E-01	0.0275	0.000E+00	0.0000	0.000E+00	0.0000	9.886E-03	0.0007
Th-228	9.641E-01	0.0730	2.161E-01	0.0164	0.000E+00	0.0000	9.322E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.100E-03	0.0002
Th-230	9.165E-04	0.0001	2.332E-01	0.0177	0.000E+00	0.0000	7.472E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.404E-03	0.0002
Th-232	2.245E-01	0.0170	1.775E+00	0.1344	0.000E+00	0.0000	1.237E-01	0.0094	0.000E+00	0.0000	0.000E+00	0.0000	1.971E-02	0.0015
U-234	4.472E-05	0.0000	9.422E-02	0.0071	0.000E+00	0.0000	7.391E-02	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	1.237E-03	0.0001
U-238	1.474E-02	0.0011	8.423E-02	0.0064	0.000E+00	0.0000	7.025E-02	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	1.176E-03	0.0001
Total	3.834E+00	0.2903	2.569E+00	0.1946	0.000E+00	0.0000	6.728E+00	0.5095	0.000E+00	0.0000	0.000E+00	0.0000	7.513E-02	0.0057

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.

Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.604E+00	0.4244
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.740E+00	0.1317
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.942E+00	0.1471
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.193E+00	0.0903
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.439E-01	0.0185
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.143E+00	0.1623
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	1.694E-01	0.0128
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	1.704E-01	0.0129
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	1.321E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	6.077E-04	0.0000	1.485E-02	0.0011	0.000E+00	0.0000	5.215E+00	0.3954	0.000E+00	0.0000	0.000E+00	0.0000	2.850E-02	0.0022
Ra-226	1.200E+00	0.0910	7.825E-03	0.0006	0.000E+00	0.0000	8.551E-01	0.0648	0.000E+00	0.0000	0.000E+00	0.0000	9.067E-03	0.0007
Ra-228	1.553E+00	0.1177	2.102E-01	0.0159	0.000E+00	0.0000	2.893E-01	0.0219	0.000E+00	0.0000	0.000E+00	0.0000	9.151E-03	0.0007
Th-228	4.671E-01	0.0354	1.047E-01	0.0079	0.000E+00	0.0000	4.517E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-03	0.0001
Th-230	1.958E-03	0.0001	2.332E-01	0.0177	0.000E+00	0.0000	8.071E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.412E-03	0.0002
Th-232	5.912E-01	0.0448	1.820E+00	0.1380	0.000E+00	0.0000	2.021E-01	0.0153	0.000E+00	0.0000	0.000E+00	0.0000	2.202E-02	0.0017
U-234	4.463E-05	0.0000	9.398E-02	0.0071	0.000E+00	0.0000	7.371E-02	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	1.234E-03	0.0001
U-238	1.470E-02	0.0011	8.400E-02	0.0064	0.000E+00	0.0000	7.007E-02	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	1.173E-03	0.0001
Total	3.828E+00	0.2902	2.568E+00	0.1947	0.000E+00	0.0000	6.718E+00	0.5093	0.000E+00	0.0000	0.000E+00	0.0000	7.505E-02	0.0057

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.259E+00	0.3987
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.072E+00	0.1571
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.061E+00	0.1563
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.779E-01	0.0438
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.456E-01	0.0186
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.635E+00	0.1998
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	1.690E-01	0.0128
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	1.699E-01	0.0129
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	1.319E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.866E-04	0.0000	1.189E-02	0.0009	0.000E+00	0.0000	4.176E+00	0.3179	0.000E+00	0.0000	0.000E+00	0.0000	2.282E-02	0.0017
Ra-226	1.189E+00	0.0905	1.063E-02	0.0008	0.000E+00	0.0000	1.859E+00	0.1415	0.000E+00	0.0000	0.000E+00	0.0000	1.451E-02	0.0011
Ra-228	9.079E-01	0.0691	1.446E-01	0.0110	0.000E+00	0.0000	1.259E-01	0.0096	0.000E+00	0.0000	0.000E+00	0.0000	4.696E-03	0.0004
Th-228	3.698E-02	0.0028	8.289E-03	0.0006	0.000E+00	0.0000	3.576E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-04	0.0000
Th-230	5.579E-03	0.0004	2.332E-01	0.0177	0.000E+00	0.0000	1.225E-02	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	2.447E-03	0.0002
Th-232	1.658E+00	0.1262	1.980E+00	0.1507	0.000E+00	0.0000	3.682E-01	0.0280	0.000E+00	0.0000	0.000E+00	0.0000	2.781E-02	0.0021
U-234	4.445E-05	0.0000	9.312E-02	0.0071	0.000E+00	0.0000	7.303E-02	0.0056	0.000E+00	0.0000	0.000E+00	0.0000	1.223E-03	0.0001
U-238	1.456E-02	0.0011	8.323E-02	0.0063	0.000E+00	0.0000	6.942E-02	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	1.162E-03	0.0001
Total	3.812E+00	0.2902	2.565E+00	0.1953	0.000E+00	0.0000	6.685E+00	0.5089	0.000E+00	0.0000	0.000E+00	0.0000	7.479E-02	0.0057

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.211E+00	0.3206
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.073E+00	0.2339
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.183E+00	0.0901
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.575E-02	0.0035
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.534E-01	0.0193
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.034E+00	0.3071
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	1.674E-01	0.0127
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	1.684E-01	0.0128
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	1.314E+01	1.0000

0*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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	2.579E-04	0.0000	6.301E-03	0.0005	0.000E+00	0.0000	2.213E+00	0.1702	0.000E+00	0.0000	0.000E+00	0.0000	1.209E-02	0.0009
Ra-226	1.156E+00	0.0890	1.573E-02	0.0012	0.000E+00	0.0000	3.701E+00	0.2847	0.000E+00	0.0000	0.000E+00	0.0000	2.446E-02	0.0019
Ra-228	8.479E-02	0.0065	1.382E-02	0.0011	0.000E+00	0.0000	1.113E-02	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	4.291E-04	0.0000
Th-228	2.636E-05	0.0000	5.908E-06	0.0000	0.000E+00	0.0000	2.549E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.474E-08	0.0000
Th-230	1.574E-02	0.0012	2.332E-01	0.0179	0.000E+00	0.0000	3.724E-02	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-03	0.0002

Th-232	2.511E+00	0.1932	2.118E+00	0.1629	0.000E+00	0.0000	4.825E-01	0.0371	0.000E+00	0.0000	0.000E+00	0.0000	3.216E-02	0.0025
U-234	4.518E-05	0.0000	9.071E-02	0.0070	0.000E+00	0.0000	7.112E-02	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	1.191E-03	0.0001
U-238	1.418E-02	0.0011	8.105E-02	0.0062	0.000E+00	0.0000	6.761E-02	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	1.132E-03	0.0001
Total	3.782E+00	0.2910	2.559E+00	0.1969	0.000E+00	0.0000	6.584E+00	0.5065	0.000E+00	0.0000	0.000E+00	0.0000	7.408E-02	0.0057

0

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

0

Water Dependent Pathways

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.232E+00	0.1717
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.898E+00	0.3768
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-01	0.0085
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.261E-05	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.888E-01	0.0222
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.144E+00	0.3957
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	1.631E-01	0.0125
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	1.640E-01	0.0126
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	1.300E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0

Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	2.794E-05	0.0000	6.827E-04	0.0001	0.000E+00	0.0000	2.398E-01	0.0191	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-03	0.0001
Ra-226	1.050E+00	0.0838	1.943E-02	0.0016	0.000E+00	0.0000	5.171E+00	0.4126	0.000E+00	0.0000	0.000E+00	0.0000	3.209E-02	0.0026
Ra-228	1.718E-05	0.0000	2.801E-06	0.0000	0.000E+00	0.0000	2.255E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.691E-08	0.0000
Th-228	2.548E-16	0.0000	5.712E-17	0.0000	0.000E+00	0.0000	2.464E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.193E-19	0.0000
Th-230	4.914E-02	0.0039	2.336E-01	0.0186	0.000E+00	0.0000	1.821E-01	0.0145	0.000E+00	0.0000	0.000E+00	0.0000	3.533E-03	0.0003
Th-232	2.595E+00	0.2070	2.132E+00	0.1701	0.000E+00	0.0000	4.935E-01	0.0394	0.000E+00	0.0000	0.000E+00	0.0000	3.259E-02	0.0026
U-234	6.100E-05	0.0000	8.279E-02	0.0066	0.000E+00	0.0000	6.486E-02	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	1.087E-03	0.0001
U-238	1.292E-02	0.0010	7.387E-02	0.0059	0.000E+00	0.0000	6.162E-02	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	1.031E-03	0.0001
Total	3.707E+00	0.2958	2.542E+00	0.2028	0.000E+00	0.0000	6.213E+00	0.4957	0.000E+00	0.0000	0.000E+00	0.0000	7.164E-02	0.0057

0

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

0

Water Dependent Pathways

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.418E-01	0.0193
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.272E+00	0.5004
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.232E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.152E-16	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.684E-01	0.0374
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.253E+00	0.4191
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	1.488E-01	0.0119
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	1.494E-01	0.0119
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	1.253E+01	1.0000

0*Sum of all water independent and dependent pathways.

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

0

Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	4.883E-08	0.0000	1.193E-06	0.0000	0.000E+00	0.0000	4.190E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.289E-06	0.0000
Ra-226	7.963E-01	0.0700	1.527E-02	0.0013	0.000E+00	0.0000	4.107E+00	0.3608	0.000E+00	0.0000	0.000E+00	0.0000	2.536E-02	0.0022
Ra-228	4.807E-16	0.0000	7.838E-17	0.0000	0.000E+00	0.0000	6.310E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.432E-18	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.284E-01	0.0113	2.347E-01	0.0206	0.000E+00	0.0000	5.879E-01	0.0516	0.000E+00	0.0000	0.000E+00	0.0000	6.035E-03	0.0005
Th-232	2.594E+00	0.2279	2.131E+00	0.1872	0.000E+00	0.0000	4.934E-01	0.0433	0.000E+00	0.0000	0.000E+00	0.0000	3.258E-02	0.0029
U-234	1.328E-04	0.0000	6.381E-02	0.0056	0.000E+00	0.0000	5.034E-02	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	8.406E-04	0.0001
U-238	9.909E-03	0.0009	5.668E-02	0.0050	0.000E+00	0.0000	4.728E-02	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	7.913E-04	0.0001
Total	3.529E+00	0.3100	2.502E+00	0.2198	0.000E+00	0.0000	5.287E+00	0.4644	0.000E+00	0.0000	0.000E+00	0.0000	6.560E-02	0.0058

0

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

0

Water Dependent Pathways

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.226E-04	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.944E+00	0.4343
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.246E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.571E-01	0.0841
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.252E+00	0.4613
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	1.152E-01	0.0101
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	1.147E-01	0.0101
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	1.138E+01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
0
Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.089E-17	0.0000	2.661E-16	0.0000	0.000E+00	0.0000	9.346E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.106E-16	0.0000
Ra-226	3.025E-01	0.0331	5.800E-03	0.0006	0.000E+00	0.0000	1.560E+00	0.1709	0.000E+00	0.0000	0.000E+00	0.0000	9.633E-03	0.0011
Ra-228	0.000E-00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.816E-01	0.0308	2.360E-01	0.0258	0.000E+00	0.0000	1.379E+00	0.1510	0.000E+00	0.0000	0.000E+00	0.0000	1.090E-02	0.0012
Th-232	2.592E+00	0.2839	2.130E+00	0.2333	0.000E+00	0.0000	4.930E-01	0.0540	0.000E+00	0.0000	0.000E+00	0.0000	3.255E-02	0.0036
U-234	1.014E-03	0.0001	2.611E-02	0.0029	0.000E+00	0.0000	2.437E-02	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	3.690E-04	0.0000
U-238	3.913E-03	0.0004	2.243E-02	0.0025	0.000E+00	0.0000	1.871E-02	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	3.131E-04	0.0000
Total	3.181E+00	0.3484	2.420E+00	0.2651	0.000E+00	0.0000	3.475E+00	0.3806	0.000E+00	0.0000	0.000E+00	0.0000	5.377E-02	0.0059

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
0
Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.425E-14	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.878E+00	0.2057
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.907E+00	0.2089
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.248E+00	0.5747
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	5.186E-02	0.0057
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	4.536E-02	0.0050
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.130E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	3.857E-01	3.736E-01	3.506E-01	2.808E-01	1.488E-01	1.612E-02	2.817E-05	6.283E-15
0Ra-226	Ra-226	1.000E+00	9.861E-02	9.847E-02	9.820E-02	9.725E-02	9.460E-02	8.587E-02	6.513E-02	2.474E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	1.751E-02	3.994E-02	1.076E-01	2.319E-01	3.323E-01	2.645E-01	1.005E-01
Ra-226	DSR(j)		9.861E-02	1.160E-01	1.381E-01	2.049E-01	3.265E-01	4.182E-01	3.296E-01	1.252E-01
0Ra-228	Ra-228	1.000E+00	5.881E-02	5.208E-02	4.085E-02	1.745E-02	1.536E-03	3.111E-07	8.707E-18	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	3.424E-02	5.076E-02	3.513E-02	3.360E-03	6.809E-07	1.906E-17	0.000E+00
Ra-228	DSR(j)		5.881E-02	8.633E-02	9.161E-02	5.259E-02	4.897E-03	9.920E-07	2.776E-17	0.000E+00
0Th-228	Th-228	1.000E+00	7.615E-02	5.301E-02	2.568E-02	2.033E-03	1.449E-06	1.401E-17	0.000E+00	0.000E+00
0Th-230	Th-230	1.000E+00	1.619E-02	1.619E-02	1.619E-02	1.619E-02	1.619E-02	1.618E-02	1.614E-02	1.603E-02
Th-230	Ra-226	1.000E+00	0.000E+00	6.383E-05	1.490E-04	4.454E-04	1.276E-03	4.009E-03	1.049E-02	2.302E-02
Th-230	Pb-210	1.000E+00	0.000E+00	5.861E-06	3.086E-05	2.586E-04	1.791E-03	1.104E-02	3.717E-02	8.809E-02
Th-230	DSR(j)		1.619E-02	1.626E-02	1.637E-02	1.690E-02	1.926E-02	3.123E-02	6.380E-02	1.271E-01
0Th-232	Th-232	1.000E+00	8.139E-02	8.139E-02	8.139E-02	8.139E-02	8.139E-02	8.138E-02	8.137E-02	8.130E-02
Th-232	Ra-228	1.000E+00	0.000E+00	1.022E-02	2.137E-02	4.459E-02	6.038E-02	6.190E-02	6.188E-02	6.183E-02
Th-232	Th-228	1.000E+00	0.000E+00	3.618E-03	1.434E-02	5.331E-02	8.685E-02	9.017E-02	9.016E-02	9.009E-02
Th-232	DSR(j)		8.139E-02	9.524E-02	1.171E-01	1.793E-01	2.286E-01	2.335E-01	2.334E-01	2.332E-01
0U-234	U-234	1.000E+00	1.131E-02	1.129E-02	1.126E-02	1.116E-02	1.087E-02	9.900E-03	7.587E-03	2.989E-03
U-234	Th-230	1.000E+00	0.000E+00	2.210E-07	5.116E-07	1.522E-06	4.359E-06	1.371E-05	3.605E-05	8.013E-05
U-234	Ra-226	1.000E+00	0.000E+00	4.453E-10	2.358E-09	2.101E-08	1.741E-07	1.775E-06	1.329E-05	8.190E-05
U-234	Pb-210	1.000E+00	0.000E+00	2.797E-11	3.290E-10	8.343E-09	1.749E-07	3.926E-06	4.287E-05	3.060E-04
U-234	DSR(j)		1.131E-02	1.129E-02	1.126E-02	1.116E-02	1.087E-02	9.920E-03	7.679E-03	3.457E-03
0U-238	U-238	1.000E+00	1.137E-02	1.136E-02	1.133E-02	1.122E-02	1.093E-02	9.960E-03	7.637E-03	3.015E-03
U-238	U-234	1.000E+00	0.000E+00	4.802E-08	1.118E-07	3.322E-07	9.396E-07	2.821E-06	6.466E-06	8.491E-06
U-238	Th-230	1.000E+00	0.000E+00	4.924E-13	2.566E-12	2.266E-11	1.873E-10	1.910E-09	1.435E-08	8.939E-08
U-238	Ra-226	1.000E+00	0.000E+00	6.741E-16	7.891E-15	2.084E-13	5.001E-12	1.667E-10	3.650E-09	6.853E-08
U-238	Pb-210	1.000E+00	0.000E+00	3.153E-17	8.300E-16	6.300E-14	3.933E-12	3.098E-10	1.080E-08	2.493E-07
U-238	DSR(j)		1.137E-02	1.136E-02	1.133E-02	1.122E-02	1.093E-02	9.963E-03	7.644E-03	3.024E-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 ≥ 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 30 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	7.779E+01	8.030E+01	8.556E+01	1.069E+02	2.016E+02	1.861E+03	1.065E+06	*7.631E+13
Ra-226	2.874E+02	2.587E+02	2.172E+02	1.464E+02	9.187E+01	7.174E+01	9.101E+01	2.396E+02
Ra-228	4.113E+02	3.475E+02	3.275E+02	5.705E+02	6.126E+03	3.024E+07	*2.726E+14	*2.726E+14
Th-228	3.939E+02	5.660E+02	1.168E+03	1.476E+04	2.070E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	1.850E+03	1.845E+03	1.832E+03	1.776E+03	1.558E+03	9.608E+02	4.702E+02	2.360E+02
Th-232	3.507E+02	3.150E+02	2.562E+02	1.673E+02	1.312E+02	1.285E+02	1.285E+02	1.286E+02
U-234	2.653E+03	2.656E+03	2.663E+03	2.688E+03	2.760E+03	3.024E+03	3.907E+03	8.677E+03
U-238	2.637E+03	2.641E+03	2.648E+03	2.673E+03	2.744E+03	3.011E+03	3.925E+03	9.921E+03

*At specific activity limit
0

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

0Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	1.500E+01	0.000E+00	3.857E-01	7.779E+01	3.857E-01	7.779E+01
Ra-226	1.500E+01	95.4 ± 0.2	4.183E-01	7.171E+01	1.044E-01	2.874E+02
Ra-228	2.250E+01	2.489 ± 0.005	9.209E-02	3.258E+02	7.294E-02	4.113E+02

Th-228	2.250E+01	0.000E+00	7.615E-02	3.939E+02	7.615E-02	3.939E+02
Th-230	1.500E+01	1.000E+03	1.271E-01	2.360E+02	1.622E-02	1.850E+03
Th-232	2.250E+01	92.6 ñ 0.2	2.335E-01	1.285E+02	8.554E-02	3.507E+02
U-234	1.500E+01	0.000E+00	1.131E-02	2.653E+03	1.131E-02	2.653E+03
U-238	1.500E+01	0.000E+00	1.137E-02	2.637E+03	1.137E-02	2.637E+03

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.785E+00	5.604E+00	5.259E+00	4.211E+00	2.232E+00	2.418E-01	4.226E-04	9.425E-14
Pb-210	Ra-226	1.000E+00	8.661E-02	2.627E-01	5.991E-01	1.614E+00	3.479E+00	4.984E+00	3.967E+00	1.507E+00
Pb-210	Th-230	1.000E+00	1.218E-05	8.791E-05	4.629E-04	3.879E-03	2.686E-02	1.656E-01	5.575E-01	1.321E+00
Pb-210	U-234	1.000E+00	2.680E-11	4.196E-10	4.935E-09	1.251E-07	2.624E-06	5.889E-05	6.430E-04	4.590E-03
Pb-210	U-238	1.000E+00	9.902E-18	4.729E-16	1.245E-14	9.450E-13	5.900E-11	4.646E-09	1.620E-07	3.740E-06
Pb-210	DOSE(j):		5.872E+00	5.867E+00	5.859E+00	5.829E+00	5.738E+00	5.392E+00	4.526E+00	2.833E+00
0Ra-226	Ra-226	1.000E+00	1.479E+00	1.477E+00	1.473E+00	1.459E+00	1.419E+00	1.288E+00	9.769E-01	3.711E-01
Ra-226	Th-230	1.000E+00	3.176E-04	9.574E-04	2.235E-03	6.680E-03	1.914E-02	6.013E-02	1.574E-01	3.453E-01
Ra-226	U-234	1.000E+00	9.477E-10	6.680E-09	3.538E-08	3.151E-07	2.611E-06	2.662E-05	1.993E-04	1.229E-03
Ra-226	U-238	1.000E+00	6.662E-16	1.011E-14	1.184E-13	3.126E-12	7.501E-11	2.501E-09	5.475E-08	1.028E-06
Ra-226	DOSE(j):		1.479E+00	1.478E+00	1.475E+00	1.465E+00	1.438E+00	1.348E+00	1.135E+00	7.176E-01
0Ra-228	Ra-228	1.000E+00	1.323E+00	1.172E+00	9.191E-01	3.926E-01	3.457E-02	7.000E-06	1.959E-16	0.000E+00
Ra-228	Th-232	1.000E+00	8.007E-02	2.301E-01	4.809E-01	1.003E+00	1.358E+00	1.393E+00	1.392E+00	1.391E+00
Ra-228	DOSE(j):		1.403E+00	1.402E+00	1.400E+00	1.396E+00	1.393E+00	1.393E+00	1.392E+00	1.391E+00
0Th-228	Ra-228	1.000E+00	3.179E-01	7.704E-01	1.142E+00	7.905E-01	7.561E-02	1.532E-05	4.287E-16	0.000E+00
Th-228	Th-228	1.000E+00	1.713E+00	1.193E+00	5.779E-01	4.575E-02	3.261E-05	3.152E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	1.334E-02	8.140E-02	3.226E-01	1.199E+00	1.954E+00	2.029E+00	2.028E+00	2.027E+00
Th-228	DOSE(j):		2.045E+00	2.044E+00	2.043E+00	2.036E+00	2.030E+00	2.029E+00	2.028E+00	2.027E+00
0Th-230	Th-230	1.000E+00	2.429E-01	2.429E-01	2.429E-01	2.429E-01	2.428E-01	2.427E-01	2.422E-01	2.405E-01
Th-230	U-234	1.000E+00	1.126E-06	3.316E-06	7.674E-06	2.284E-05	6.538E-05	2.056E-04	5.408E-04	1.202E-03
Th-230	U-238	1.000E+00	1.085E-12	7.386E-12	3.849E-11	3.399E-10	2.810E-09	2.865E-08	2.152E-07	1.341E-06
Th-230	DOSE(j):		2.429E-01	2.429E-01	2.429E-01	2.429E-01	2.429E-01	2.429E-01	2.427E-01	2.417E-01
0Th-232	Th-232	1.000E+00	1.831E+00	1.831E+00	1.831E+00	1.831E+00	1.831E+00	1.831E+00	1.831E+00	1.829E+00
0U-234	U-234	1.000E+00	1.696E-01	1.694E-01	1.690E-01	1.674E-01	1.630E-01	1.485E-01	1.138E-01	4.484E-02
U-234	U-238	1.000E+00	2.404E-07	7.204E-07	1.676E-06	4.983E-06	1.409E-05	4.232E-05	9.699E-05	1.274E-04
U-234	DOSE(j):		1.696E-01	1.694E-01	1.690E-01	1.674E-01	1.630E-01	1.485E-01	1.139E-01	4.497E-02
0U-238	U-238	1.000E+00	1.706E-01	1.704E-01	1.699E-01	1.684E-01	1.640E-01	1.494E-01	1.146E-01	4.523E-02

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	1.500E+01	1.453E+01	1.364E+01	1.092E+01	5.787E+00	6.270E-01	1.096E-03	2.444E-13
Pb-210	Ra-226	1.000E+00	0.000E+00	4.586E-01	1.331E+00	3.966E+00	8.807E+00	1.273E+01	1.014E+01	3.852E+00
Pb-210	Th-230	1.000E+00	0.000E+00	9.989E-05	8.795E-04	9.067E-03	6.678E-02	4.203E-01	1.422E+00	3.374E+00
Pb-210	U-234	1.000E+00	0.000E+00	3.004E-10	7.975E-09	2.785E-07	6.415E-06	1.487E-04	1.637E-03	1.172E-02
Pb-210	U-238	1.000E+00	0.000E+00	2.054E-16	1.694E-14	2.002E-12	1.419E-10	1.167E-08	4.119E-07	9.542E-06
Pb-210	S(j):		1.500E+01	1.499E+01	1.497E+01	1.489E+01	1.466E+01	1.378E+01	1.156E+01	7.238E+00
0Ra-226	Ra-226	1.000E+00	1.500E+01	1.498E+01	1.494E+01	1.479E+01	1.439E+01	1.306E+01	9.907E+00	3.763E+00
Ra-226	Th-230	1.000E+00	0.000E+00	6.494E-03	1.945E-02	6.453E-02	1.909E-01	6.066E-01	1.593E+00	3.499E+00
Ra-226	U-234	1.000E+00	0.000E+00	2.922E-08	2.625E-07	2.898E-06	2.562E-05	2.672E-04	2.014E-03	1.244E-02
Ra-226	U-238	1.000E+00	0.000E+00	2.758E-14	7.440E-13	2.736E-11	7.239E-10	2.499E-08	5.524E-07	1.041E-05
Ra-226	S(j):		1.500E+01	1.499E+01	1.496E+01	1.486E+01	1.458E+01	1.367E+01	1.150E+01	7.275E+00
0Ra-228	Ra-228	1.000E+00	2.250E+01	1.993E+01	1.563E+01	6.676E+00	5.878E-01	1.190E-04	3.331E-15	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	2.554E+00	6.819E+00	1.570E+01	2.174E+01	2.232E+01	2.232E+01	2.230E+01
Ra-228	S(j):		2.250E+01	2.248E+01	2.245E+01	2.238E+01	2.233E+01	2.232E+01	2.232E+01	2.230E+01
0Th-228	Ra-228	1.000E+00	0.000E+00	6.416E+00	1.210E+01	9.141E+00	8.837E-01	1.791E-04	5.011E-15	0.000E+00
Th-228	Th-228	1.000E+00	2.250E+01	1.566E+01	7.588E+00	6.007E-01	4.282E-04	4.139E-15	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	4.194E-01	2.795E+00	1.266E+01	2.145E+01	2.232E+01	2.232E+01	2.230E+01
Th-228	S(j):		2.250E+01	2.250E+01	2.248E+01	2.240E+01	2.233E+01	2.232E+01	2.232E+01	2.230E+01
0Th-230	Th-230	1.000E+00	1.500E+01	1.500E+01	1.500E+01	1.500E+01	1.500E+01	1.498E+01	1.495E+01	1.485E+01
Th-230	U-234	1.000E+00	0.000E+00	1.349E-04	4.043E-04	1.341E-03	3.970E-03	1.264E-02	3.335E-02	7.420E-02
Th-230	U-238	1.000E+00	0.000E+00	1.912E-10	1.718E-09	1.897E-08	1.677E-07	1.752E-06	1.325E-05	8.274E-05
Th-230	S(j):		1.500E+01	1.500E+01	1.500E+01	1.500E+01	1.500E+01	1.500E+01	1.499E+01	1.492E+01
0Th-232	Th-232	1.000E+00	2.250E+01	2.250E+01	2.250E+01	2.250E+01	2.250E+01	2.250E+01	2.249E+01	2.248E+01
0U-234	U-234	1.000E+00	1.500E+01	1.498E+01	1.494E+01	1.480E+01	1.441E+01	1.313E+01	1.006E+01	3.965E+00
U-234	U-238	1.000E+00	0.000E+00	4.247E-05	1.271E-04	4.196E-04	1.226E-03	3.723E-03	8.562E-03	1.126E-02
U-234	S(j):		1.500E+01	1.498E+01	1.494E+01	1.480E+01	1.441E+01	1.313E+01	1.007E+01	3.976E+00
0U-238	U-238	1.000E+00	1.500E+01	1.498E+01	1.494E+01	1.480E+01	1.441E+01	1.313E+01	1.007E+01	3.976E+00

BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3 EXE execution time = 30.32 seconds

RDGRES

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Dose Conversion Factor (and Related) Parameter Summary
File: 71622866.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(3)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(6)
B-1	U-234	1.320E-01	1.320E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(3)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(6)
D-1	U-234	2.830E-04	2.830E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	3.450E-03	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	8.420E-04	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	8.420E-04	4.000E-02	RTF(3,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	4.770E-05	1.000E-03	RTF(4,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	4.770E-05	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	4.770E-05	1.000E-03	RTF(6,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	1.120E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: 71622866.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	1.120E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)
D-5				

D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	4.000E+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)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-228	7.500E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-228	7.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-230	5.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-232	7.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	5.000E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	5.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	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)	1.000E-03	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	Romberg failures occurred	EPS

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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 Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.653E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.495E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.495E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.111E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.111E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.111E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.328E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.328E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.226E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	3.100E-06	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)	1.650E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

R018	Fruits, vegetables and grain consumption (kg/yr)	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)	3.650E+01	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
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)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Rador 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	513	---	---	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:	1000.00 square meters
Thickness:	4.00 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g

Pb-210	5.000E+00
Ra-226	5.000E+00
Ra-228	7.500E+00
Th-228	7.500E+00
Th-230	5.000E+00
Th-232	7.500E+00
U-234	5.000E+00
U-238	5.000E+00

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 30 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	2.700E+00	2.698E+00	2.695E+00	2.683E+00	2.663E+00	2.609E+00	2.482E+00	2.235E+00
M(t):	9.001E-02	8.995E-02	8.983E-02	8.944E-02	8.875E-02	8.697E-02	8.275E-02	7.449E-02

0Maximum TDOSE(t): 2.700E+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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.595E-04	0.0002	7.162E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.155E-02	0.0080
Ra-226	8.284E-01	0.3068	2.807E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.339E-03	0.0016
Ra-228	7.998E-01	0.2962	2.735E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.689E-03	0.0025
Th-228	9.523E-01	0.3527	1.362E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.062E-03	0.0011
Th-230	2.715E-04	0.0001	1.023E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.651E-03	0.0006
Th-232	4.579E-02	0.0170	7.728E-03	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.273E-02	0.0047
U-234	3.078E-05	0.0000	4.137E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.516E-04	0.0003
U-238	1.015E-02	0.0038	3.699E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.095E-04	0.0003
Total	2.637E+00	0.9767	1.127E-02	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.168E-02	0.0191

0

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
0 Water Dependent Pathways

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.208E-02	0.0082
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.328E-01	0.3084
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.068E-01	0.2988
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.567E-01	0.3543
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.945E-03	0.0011
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.625E-02	0.0245
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	1.296E-03	0.0005
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	1.133E-02	0.0042
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.700E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0 Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	4.452E-04	0.0002	6.939E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.087E-02	0.0077
Ra-226	8.273E-01	0.3066	3.022E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.991E-03	0.0018
Ra-228	9.798E-01	0.3631	6.304E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.797E-03	0.0025
Th-228	6.628E-01	0.2456	9.478E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.131E-03	0.0008
Th-230	6.301E-04	0.0002	1.023E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.653E-03	0.0006
Th-232	1.543E-01	0.0572	7.784E-03	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.355E-02	0.0050
U-234	3.074E-05	0.0000	4.132E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.505E-04	0.0003
U-238	1.013E-02	0.0038	3.694E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.084E-04	0.0003
Total	2.636E+00	0.9767	1.127E-02	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.165E-02	0.0191

0

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

0 Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.

Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.139E-02	0.0079
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.323E-01	0.3084
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.873E-01	0.3659
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.659E-01	0.2468
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.306E-03	0.0012
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.757E-01	0.0651
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	1.294E-03	0.0005
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	1.131E-02	0.0042
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.698E+00	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : Rdg-resident File: RDGRES.RAD

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	4.178E-04	0.0002	6.512E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.959E-02	0.0073
Ra-226	8.250E-01	0.3062	3.431E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.233E-03	0.0023
Ra-228	1.067E+00	0.3961	9.219E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.292E-03	0.0023
Th-228	3.211E-01	0.1192	4.592E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.032E-03	0.0004
Th-230	1.346E-03	0.0005	1.023E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.658E-03	0.0006
Th-232	4.065E-01	0.1508	7.980E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.514E-02	0.0056
U-234	3.068E-05	0.0000	4.121E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.483E-04	0.0003
U-238	1.011E-02	0.0037	3.684E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.063E-04	0.0003
Total	2.632E+00	0.9767	1.126E-02	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.160E-02	0.0191

0

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.007E-02	0.0074
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.313E-01	0.3085
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.075E+00	0.3988
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.226E-01	0.1197
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.026E-03	0.0015
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.296E-01	0.1594
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	1.291E-03	0.0005
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	1.128E-02	0.0042
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.695E+00	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : Rdg-resident File: RDGRES.RAD

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

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	3.345E-04	0.0001	5.214E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.569E-02	0.0058
Ra-226	8.172E-01	0.3045	4.663E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.976E-03	0.0037
Ra-228	6.242E-01	0.2326	6.343E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.229E-03	0.0012
Th-228	2.542E-02	0.0095	3.635E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.174E-05	0.0000
Th-230	3.836E-03	0.0014	1.023E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.683E-03	0.0006
Th-232	1.140E+00	0.4247	8.685E-03	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.912E-02	0.0071
U-234	3.056E-05	0.0000	4.084E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.405E-04	0.0003
U-238	1.001E-02	0.0037	3.650E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.988E-04	0.0003
Total	2.621E+00	0.9766	1.125E-02	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.142E-02	0.0192

0

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

0 Radio-Nuclide	Water mrem/yr	fract.	Fish mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	All Pathways* mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-02	0.0060
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.272E-01	0.3083
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.280E-01	0.2341
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.554E-02	0.0095
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.541E-03	0.0024
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.167E+00	0.4351
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	1.279E-03	0.0005
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	1.118E-02	0.0042
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.683E+00	1.0000

0*Sum of all water independent and dependent pathways.

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Summary : Rdg-resident File: RDGRES.RAD

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
0 Water Independent Pathways (Inhalation excludes radon)

0 Radio-Nuclide	Ground mrem/yr	fract.	Inhalation mrem/yr	fract.	Radon mrem/yr	fract.	Plant mrem/yr	fract.	Meat mrem/yr	fract.	Milk mrem/yr	fract.	Soil mrem/yr	fract.
Pb-210	1.773E-04	0.0001	2.763E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.313E-03	0.0031
Ra-226	7.950E-01	0.2986	6.899E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.681E-02	0.0063
Ra-228	5.829E-02	0.0219	6.062E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.950E-04	0.0001
Th-228	1.812E-05	0.0000	2.591E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.826E-08	0.0000
Th-230	1.082E-02	0.0041	1.023E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-03	0.0007

Th-232	1.726E+00	0.6484	9.290E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.211E-02	0.0083
U-234	3.106E-05	0.0000	3.978E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.188E-04	0.0003
U-238	9.750E-03	0.0037	3.555E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.779E-04	0.0003
Total	2.600E+00	0.9767	1.122E-02	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.093E-02	0.0191

0

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

0

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.518E-03	0.0032
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.119E-01	0.3049
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.865E-02	0.0220
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.821E-05	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.364E-02	0.0051
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.758E+00	0.6601
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	1.248E-03	0.0005
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	1.088E-02	0.0041
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.663E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	1.921E-05	0.0000	2.994E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.007E-04	0.0003
Ra-226	7.218E-01	0.2767	8.523E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.206E-02	0.0085
Ra-228	1.131E-05	0.0000	1.228E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.975E-08	0.0000
Th-228	1.752E-16	0.0000	2.505E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.633E-19	0.0000
Th-230	3.379E-02	0.0129	1.025E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.429E-03	0.0009
Th-232	1.784E+00	0.6838	9.349E-03	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.240E-02	0.0086
U-234	4.194E-05	0.0000	3.631E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.472E-04	0.0003
U-238	8.884E-03	0.0034	3.240E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.091E-04	0.0003
Total	2.549E+00	0.9768	1.115E-02	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.925E-02	0.0189

0

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

0

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-04	0.0004
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.440E-01	0.2852
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.188E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.760E-16	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.724E-02	0.0143
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.816E+00	0.6960
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	1.152E-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	9.917E-03	0.0038
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.609E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

0

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	3.357E-08	0.0000	5.232E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.574E-06	0.0000
Ra-226	5.475E-01	0.2205	6.696E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.743E-02	0.0070
Ra-228	3.305E-16	0.0000	3.437E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.672E-18	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	8.830E-02	0.0356	1.029E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.149E-03	0.0017
Th-232	1.784E+00	0.7185	9.347E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.240E-02	0.0090
U-234	1.325E-04	0.0001	2.799E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.779E-04	0.0002
U-238	6.812E-03	0.0027	2.486E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.440E-04	0.0002
Total	2.426E+00	0.9774	1.097E-02	0.0044	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.510E-02	0.0182

0

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

0

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.613E-06	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.650E-01	0.2276
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.325E-16	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.348E-02	0.0377
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.815E+00	0.7313
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	9.903E-04	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	7.605E-03	0.0031
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.482E+00	1.0000

0*Sum of all water independent and dependent pathways.

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

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.487E-18	0.0000	1.167E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.511E-16	0.0000
Ra-226	2.080E-01	0.0931	2.544E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.622E-03	0.0030
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.936E-01	0.0866	1.035E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.493E-03	0.0034
Th-232	1.782E+00	0.7975	9.340E-03	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.238E-02	0.0100
U-234	6.970E-04	0.0003	1.145E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.537E-04	0.0001
U-238	2.690E-03	0.0012	9.836E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.152E-04	0.0001
Total	2.187E+00	0.9787	1.061E-02	0.0047	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.697E-02	0.0165

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

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.597E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.146E-01	0.0960
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.021E-01	0.0905
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.814E+00	0.8117
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	1.065E-03	0.0005
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	3.004E-03	0.0013
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.235E+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	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	4.416E-03	4.278E-03	4.015E-03	3.215E-03	1.704E-03	1.846E-04	3.226E-07	7.194E-17
Ra-226	Ra-226	1.000E+00	1.665E-01	1.663E-01	1.658E-01	1.642E-01	1.597E-01	1.450E-01	1.100E-01	4.177E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	2.039E-04	4.606E-04	1.236E-03	2.659E-03	3.808E-03	3.031E-03	1.151E-03
Ra-226	DSR(j)		1.665E-01	1.665E-01	1.663E-01	1.654E-01	1.624E-01	1.488E-01	1.130E-01	4.292E-02
Ra-228	Ra-228	1.000E+00	8.406E-02	7.444E-02	5.838E-02	2.494E-02	2.196E-03	4.447E-07	1.244E-17	0.000E+00
Ra-228	Th-228	1.000E+00	0.000E+00	5.719E-02	8.490E-02	5.880E-02	5.624E-03	1.140E-06	3.189E-17	0.000E+00
Ra-228	DSR(j)		8.406E-02	1.316E-01	1.433E-01	8.374E-02	7.820E-03	1.584E-06	4.434E-17	0.000E+00
Th-228	Th-228	1.000E+00	1.276E-01	8.879E-02	4.302E-02	3.406E-03	2.427E-06	2.347E-17	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	5.529E-04	5.529E-04	5.529E-04	5.529E-04	5.528E-04	5.524E-04	5.513E-04	5.474E-04
Th-230	Ra-226	1.000E+00	0.000E+00	1.081E-04	2.520E-04	7.523E-04	2.155E-03	6.769E-03	1.772E-02	3.887E-02
Th-230	Pb-210	1.000E+00	0.000E+00	6.924E-08	3.583E-07	2.976E-06	2.055E-05	1.265E-04	4.259E-04	1.009E-03
Th-230	DSR(j)		5.529E-04	6.611E-04	8.053E-04	1.308E-03	2.729E-03	7.448E-03	1.870E-02	4.043E-02
Th-232	Th-232	1.000E+00	2.681E-03	2.681E-03	2.681E-03	2.681E-03	2.681E-03	2.681E-03	2.680E-03	2.678E-03
Th-232	Ra-228	1.000E+00	0.000E+00	1.471E-02	3.064E-02	6.382E-02	8.639E-02	8.856E-02	8.854E-02	8.847E-02
Th-232	Th-228	1.000E+00	0.000E+00	6.029E-03	2.395E-02	8.916E-02	1.453E-01	1.509E-01	1.508E-01	1.507E-01
Th-232	DSR(j)		2.681E-03	2.342E-02	5.728E-02	1.557E-01	2.344E-01	2.421E-01	2.420E-01	2.419E-01
U-234	U-234	1.000E+00	2.592E-04	2.589E-04	2.582E-04	2.558E-04	2.491E-04	2.269E-04	1.739E-04	6.852E-05
U-234	Th-230	1.000E+00	0.000E+00	7.458E-09	1.738E-08	5.190E-08	1.487E-07	4.680E-07	1.231E-06	2.736E-06
U-234	Ra-226	1.000E+00	0.000E+00	7.569E-10	3.994E-09	3.550E-08	2.940E-07	2.997E-06	2.244E-05	1.383E-04
U-234	Pb-210	1.000E+00	0.000E+00	3.351E-13	3.846E-12	9.623E-11	2.009E-09	4.501E-08	4.913E-07	3.506E-06
U-234	DSR(j)		2.592E-04	2.589E-04	2.582E-04	2.559E-04	2.495E-04	2.304E-04	1.981E-04	2.130E-04
U-238	U-238	1.000E+00	2.265E-03	2.262E-03	2.256E-03	2.235E-03	2.177E-03	1.983E-03	1.521E-03	6.004E-04
U-238	U-234	1.000E+00	0.000E+00	1.101E-09	2.562E-09	7.615E-09	2.154E-08	6.467E-08	1.482E-07	1.946E-07
U-238	Th-230	1.000E+00	0.000E+00	1.644E-14	8.674E-14	7.712E-13	6.388E-12	6.520E-11	4.898E-10	3.052E-09
U-238	Ra-226	1.000E+00	0.000E+00	1.149E-15	1.338E-14	3.524E-13	8.448E-12	2.816E-10	6.164E-09	1.157E-07
U-238	Pb-210	1.000E+00	0.000E+00	3.814E-19	9.764E-18	7.284E-16	4.520E-14	3.552E-12	1.238E-10	2.857E-09
U-238	DSR(j)		2.265E-03	2.262E-03	2.256E-03	2.235E-03	2.177E-03	1.983E-03	1.521E-03	6.007E-04

*Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≥ 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 30 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	6.794E+03	7.013E+03	7.473E+03	9.332E+03	1.761E+04	1.625E+05	9.301E+07	*7.631E+13
Ra-226	1.801E+02	1.802E+02	1.804E+02	1.813E+02	1.847E+02	2.016E+02	2.655E+02	6.989E+02
Ra-228	2.789E+02	2.279E+02	2.094E+02	3.583E+02	3.836E+03	1.894E+07	*2.726E+14	*2.726E+14
Th-228	2.352E+02	3.379E+02	6.974E+02	8.809E+03	1.236E+07	*8.192E+14	*8.192E+14	*8.192E+14
Th-230	5.093E+04	4.538E+04	3.725E+04	2.293E+04	1.099E+04	4.028E+03	1.605E+03	7.421E+02
Th-232	3.396E+03	1.281E+03	5.238E+02	1.927E+02	1.280E+02	1.239E+02	1.239E+02	1.240E+02
U-234	1.157E+05	1.159E+05	1.162E+05	1.172E+05	1.202E+05	1.302E+05	1.515E+05	1.408E+05
U-238	1.324E+04	1.326E+04	1.330E+04	1.342E+04	1.378E+04	1.512E+04	1.972E+04	4.994E+04

*At specific activity limit

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

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	5.000E+00	0.000E+00	4.416E-03	6.794E+03	4.416E-03	6.794E+03
Ra-226	5.000E+00	0.000E+00	1.666E-01	1.801E+02	1.666E-01	1.801E+02
Ra-228	7.500E+00	2.689 ñ 0.005	1.436E-01	2.090E+02	1.076E-01	2.789E+02

Th-228	7.500E+00	0.000E+00	1.276E-01	2.352E+02	1.276E-01	2.352E+02
Th-230	5.000E+00	1.000E+03	4.043E-02	7.421E+02	5.890E-04	5.093E+04
Th-232	7.500E+00	97.3 ñ 0.2	2.421E-01	1.239E+02	8.833E-03	3.396E+03
U-234	5.000E+00	0.000E+00	2.592E-04	1.157E+05	2.592E-04	1.157E+05
U-238	5.000E+00	0.000E+00	2.265E-03	1.324E+04	2.265E-03	1.324E+04

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

0Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.208E-02	2.139E-02	2.007E-02	1.607E-02	8.518E-03	9.230E-04	1.613E-06	3.597E-16
Pb-210	Ra-226	1.000E+00	3.448E-04	1.019E-03	2.303E-03	6.178E-03	1.329E-02	1.904E-02	1.515E-02	5.757E-03
Pb-210	Th-230	1.000E+00	4.993E-08	3.462E-07	1.792E-06	1.488E-05	1.027E-04	6.327E-04	2.129E-03	5.047E-03
Pb-210	U-234	1.000E+00	1.125E-13	1.675E-12	1.923E-11	4.811E-10	1.004E-08	2.251E-07	2.456E-06	1.753E-05
Pb-210	U-238	1.000E+00	4.401E-20	1.907E-18	4.882E-17	3.642E-15	2.260E-13	1.776E-11	6.190E-10	1.428E-08
Pb-210	DOSE(j):		2.242E-02	2.241E-02	2.238E-02	2.227E-02	2.191E-02	2.059E-02	1.729E-02	1.082E-02
0Ra-226	Ra-226	1.000E+00	8.325E-01	8.313E-01	8.290E-01	8.210E-01	7.986E-01	7.250E-01	5.498E-01	2.089E-01
Ra-226	Th-230	1.000E+00	1.804E-04	5.407E-04	1.260E-03	3.762E-03	1.078E-02	3.384E-02	8.859E-02	1.944E-01
Ra-226	U-234	1.000E+00	5.411E-10	3.785E-09	1.997E-08	1.775E-07	1.470E-06	1.498E-05	1.122E-04	6.914E-04
Ra-226	U-238	1.000E+00	3.819E-16	5.744E-15	6.691E-14	1.762E-12	4.224E-11	1.408E-09	3.082E-08	5.786E-07
Ra-226	DOSE(j):		8.326E-01	8.318E-01	8.303E-01	8.248E-01	8.094E-01	7.588E-01	6.385E-01	4.039E-01
0Ra-228	Ra-228	1.000E+00	6.304E-01	5.583E-01	4.379E-01	1.871E-01	1.647E-02	3.335E-06	9.333E-17	0.000E+00
Ra-228	Th-232	1.000E+00	3.877E-02	1.103E-01	2.298E-01	4.787E-01	6.479E-01	6.642E-01	6.641E-01	6.635E-01
Ra-228	DOSE(j):		6.692E-01	6.686E-01	6.677E-01	6.657E-01	6.644E-01	6.642E-01	6.641E-01	6.635E-01
0Th-228	Ra-228	1.000E+00	1.763E-01	4.290E-01	6.368E-01	4.410E-01	4.218E-02	8.547E-06	2.392E-16	0.000E+00
Th-228	Th-228	1.000E+00	9.567E-01	6.659E-01	3.226E-01	2.554E-02	1.821E-05	1.760E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	7.372E-03	4.522E-02	1.796E-01	6.687E-01	1.090E+00	1.131E+00	1.131E+00	1.130E+00
Th-228	DOSE(j):		1.140E+00	1.140E+00	1.139E+00	1.135E+00	1.132E+00	1.131E+00	1.131E+00	1.130E+00
0Th-230	Th-230	1.000E+00	2.765E-03	2.765E-03	2.765E-03	2.764E-03	2.764E-03	2.762E-03	2.756E-03	2.737E-03
Th-230	U-234	1.000E+00	1.244E-08	3.729E-08	8.690E-08	2.595E-07	7.437E-07	2.340E-06	6.154E-06	1.368E-05
Th-230	U-238	1.000E+00	1.175E-14	8.220E-14	4.337E-13	3.856E-12	3.194E-11	3.260E-10	2.449E-09	1.526E-08
Th-230	DOSE(j):		2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.764E-03	2.762E-03	2.751E-03
0Th-232	Th-232	1.000E+00	2.011E-02	2.011E-02	2.011E-02	2.011E-02	2.011E-02	2.010E-02	2.010E-02	2.008E-02
0U-234	U-234	1.000E+00	1.296E-03	1.294E-03	1.291E-03	1.279E-03	1.245E-03	1.135E-03	8.695E-04	3.426E-04
U-234	U-238	1.000E+00	1.837E-09	5.504E-09	1.281E-08	3.807E-08	1.077E-07	3.233E-07	7.411E-07	9.731E-07
U-234	DOSE(j):		1.296E-03	1.294E-03	1.291E-03	1.279E-03	1.246E-03	1.135E-03	8.703E-04	3.436E-04
0U-238	U-238	1.000E+00	1.133E-02	1.131E-02	1.128E-02	1.118E-02	1.088E-02	9.917E-03	7.604E-03	3.002E-03

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.000E+00	4.844E+00	4.546E+00	3.640E+00	1.929E+00	2.090E-01	3.652E-04	8.146E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	1.529E-01	4.438E-01	1.322E+00	2.936E+00	4.243E+00	3.380E+00	1.284E+00
Pb-210	Th-230	1.000E+00	0.000E+00	3.330E-05	2.932E-04	3.022E-03	2.226E-02	1.401E-01	4.739E-01	1.125E+00
Pb-210	U-234	1.000E+00	0.000E+00	1.001E-10	2.658E-09	9.284E-08	2.138E-06	4.956E-05	5.458E-04	3.905E-03
Pb-210	U-238	1.000E+00	0.000E+00	6.848E-17	5.648E-15	6.673E-13	4.729E-11	3.891E-09	1.373E-07	3.181E-06
Pb-210	S(j):		5.000E+00	4.997E+00	4.990E+00	4.965E+00	4.887E+00	4.592E+00	3.855E+00	2.413E+00
0Ra-226	Ra-226	1.000E+00	5.000E+00	4.993E+00	4.979E+00	4.931E+00	4.797E+00	4.354E+00	3.302E+00	1.254E+00
Ra-226	Th-230	1.000E+00	0.000E+00	2.165E-03	6.485E-03	2.151E-02	6.364E-02	2.022E-01	5.310E-01	1.166E+00
Ra-226	U-234	1.000E+00	0.000E+00	9.741E-09	8.751E-08	9.661E-07	8.539E-06	8.908E-05	6.714E-04	4.148E-03
Ra-226	U-238	1.000E+00	0.000E+00	9.194E-15	2.480E-13	9.120E-12	2.413E-10	8.329E-09	1.841E-07	3.469E-06
Ra-226	S(j):		5.000E+00	4.995E+00	4.986E+00	4.953E+00	4.860E+00	4.557E+00	3.834E+00	2.425E+00
0Ra-228	Ra-228	1.000E+00	7.500E+00	6.642E+00	5.209E+00	2.225E+00	1.959E-01	3.968E-05	1.110E-15	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	8.513E-01	2.273E+00	5.233E+00	7.247E+00	7.441E+00	7.439E+00	7.433E+00
Ra-228	S(j):		7.500E+00	7.493E+00	7.482E+00	7.459E+00	7.443E+00	7.441E+00	7.439E+00	7.433E+00
0Th-228	Ra-228	1.000E+00	0.000E+00	2.139E+00	4.032E+00	3.047E+00	2.946E-01	5.969E-05	1.670E-15	0.000E+00
Th-228	Th-228	1.000E+00	7.500E+00	5.220E+00	2.529E+00	2.002E-01	1.427E-04	1.380E-15	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	1.398E-01	9.315E-01	4.220E+00	7.149E+00	7.441E+00	7.439E+00	7.433E+00
Th-228	S(j):		7.500E+00	7.499E+00	7.493E+00	7.467E+00	7.444E+00	7.441E+00	7.439E+00	7.433E+00
0Th-230	Th-230	1.000E+00	5.000E+00	5.000E+00	5.000E+00	4.999E+00	4.998E+00	4.995E+00	4.985E+00	4.950E+00
Th-230	U-234	1.000E+00	0.000E+00	4.498E-05	1.348E-04	4.471E-04	1.323E-03	4.212E-03	1.112E-02	2.473E-02
Th-230	U-238	1.000E+00	0.000E+00	6.374E-11	5.727E-10	6.324E-09	5.591E-08	5.840E-07	4.417E-06	2.758E-05
Th-230	S(j):		5.000E+00	5.000E+00	5.000E+00	5.000E+00	5.000E+00	4.999E+00	4.996E+00	4.974E+00
0Th-232	Th-232	1.000E+00	7.500E+00	7.500E+00	7.500E+00	7.500E+00	7.500E+00	7.499E+00	7.498E+00	7.492E+00
0U-234	U-234	1.000E+00	5.000E+00	4.993E+00	4.980E+00	4.934E+00	4.804E+00	4.377E+00	3.354E+00	1.322E+00
U-234	U-238	1.000E+00	0.000E+00	1.416E-05	4.236E-05	1.399E-04	4.086E-04	1.241E-03	2.854E-03	3.752E-03
U-234	S(j):		5.000E+00	4.993E+00	4.980E+00	4.934E+00	4.805E+00	4.378E+00	3.357E+00	1.325E+00
0U-238	U-238	1.000E+00	5.000E+00	4.993E+00	4.980E+00	4.934E+00	4.805E+00	4.378E+00	3.357E+00	1.325E+00

BRF(i) is the branch fraction of the parent nuclide.
0C:\PROGRA~1\RESRAD~1\RESMAIN3.EXE execution time = 30.10 seconds