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Post Remediation Confirmatory Dose Assessment of Residual Radioactive Material at Molycorp York

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1.0 INTRODUCTION

Molycorp, Inc. (Molycorp) is seeking license termination and unrestricted release of its property located at 350 North Sherman Street in York, Pennsylvania. As part of the process of seeking the release, NRC requested that Molycorp conduct a dose assessment of the site. Malcolm Pirnie was engaged by Molycorp to prepare this dose assessment report in response to NRC's request to Molycorp.

The purpose of this report is to utilize information available from on-site measurements to evaluate the dose/risk to an average member of the critical group associated with subsurface residual radiological material (RRM) at the site.

2.0 SITE DESCRIPTION

The Molycorp site is located in Spring Garden Township just outside the York, Pennsylvania city limits. A site location map is provided in Figure 1 and a site plan is presented in Figure 2. The site occupies approximately 6.1 acres bounded by North Sherman Street to the east, Olive Street to the north, Hudson Street to the west and the active Norfolk and Southern Railroad line to the south. Site elevation is approximately 380 feet above mean sea level. An abandoned water-filled limestone quarry and commercial areas exist north of the site. Commercial properties lie east of site. The area to the south is composed of the railroad property, and commercial and multi-family dwellings. Single-family residences predominate west of the site. The property slopes to the northeast. Shallow groundwater flows in a generally northerly direction towards the quarry.

3.0 SITE BACKGROUND AND CURRENT CONDITIONS

In January 1993, Molycorp ceased licensed operations at the site, and Molycorp's NRC License was amended from an operating status to that of possession only. With the transfer of the remaining material to the Molycorp, Inc. Mountain Pass, California, facility in March 1993, all production operations ceased.

All buildings and paved roadways have been demolished and residual construction debris removed. A chain link security fence surrounds the entire site. One rail-spur and three gates provide access to the site.

In June 1999, Radiological Services, Inc. (RSI) prepared the "Decommissioning Plan for the York, PA Facility" (Molycorp 1999a) and was contracted to conduct the decommissioning of the site. As part of these decommissioning activities, RSI excavated and disposed approximately 50,000 cubic yards of soil from the eastern 3.5-acres of the

site. Excavation was terminated when bedrock was encountered or soil concentrations met the following unrestricted use criteria:

- 10 pCi/g average total thorium (Th-232 + Th-228)
- 10 pCi/g average Natural Uranium (U-238 + U-234, assuming all progeny in equilibrium and includes 5 pCi/g Ra-226)
- 5 pCi/g average Ra-226

Excavations were backfilled to grade with clean fill and lightly revegetated. By June 2002, the 3.5-acre area remediation and site restoration was completed.

RSI also collected and analyzed subsurface soil samples from Survey Units 2 and 33. Samples were collected from the center of each 5 meter by 5 meter grid across the survey unit. Samples were collected in two-foot depth intervals. Sampling was terminated when refusal was encountered.

In October 2002, MACTEC Development Corporation (MACTEC) was contracted by Molycorp to perform additional soil characterization of the remaining 2.6-acres, perform the final status survey for Building 9, demolish and remove the building debris, and relocate the on-site soil stockpile that had accumulated from previous soil excavation operations.

MACTEC collected and analyzed samples from Survey Units 1, 3, 13, 14, 20, 21, 29, 31 and 33 – all of which were located within the 2.6-acre area.

In October 2003, Molycorp engaged Malcolm Pirnie to:

- Excavate and load other material requiring disposal;
- Conduct a dose assessment regarding subsurface RRM at and beyond the property boundary adjacent to North Sherman Street and the Norfolk Southern Railroad;
- Provide surface soil characterization and gap-filling subsurface soil characterization in the unreleased 2.6-acres; and
- Complete final status survey activities for the remaining unreleased 2.6-acres.

In March and April, 2004, Malcolm Pirnie prepared final status survey release records for the Survey Units in the western 2.6-acres. The final status survey release records were based on the surface and subsurface data collected by RSI, MACTEC and Malcolm Pirnie. The final status survey release records were submitted by Molycorp to NRC in March and April, 2004.

In total, RSI, MACTEC and Malcolm Pirnie collected 1423 subsurface soil samples and 436 surface soil samples in the unreleased 2.6-acres. The average concentrations of RRM in the unreleased 2.6-acres are presented in Table 1.

TABLE 1
Average Soil Concentrations of Residual Radioactive Material in Unreleased 2.6-acre Western Portion of Molycorp's York, PA Site

	U-238	Th-232	Ra-226
Average Gross Concentration (pCi/g)	1.57	1.24	1.25
Background Concentration (pCi/g)[1]	0.89	1.51	0.89
Average Net Concentration (pCi/g)	0.68	-0.27	0.36

[1] Background concentrations above are from "Final Characterization Report, Molycorp York Site, York, Pennsylvania" (MACTEC, 2003).

4.0 DOSE ASSESSMENT

The objective of dose modeling is to assess the total effective dose equivalent (TEDE) to an average member of the critical group from residual contamination. "The critical group is defined as an individual or relatively homogenous group of individuals expected to receive the highest exposure under the assumptions of the particular scenario considered" (NUREG/CR-5512 [Kennedy and Strenge, 1992]). The dose analysis provides a reasonable and conservative estimate of radiation dose applicable to the critical population group from residual activity.

The RESRAD computer program is a pathway analysis model designed to evaluate the potential radiological dose incurred by an individual who occupies land containing residual radioactive material (Yu, et al., 2001). Seven exposure pathways are considered in the model:

1. Direct exposure to external radiation from the contaminated soil,
2. Internal dose from inhalation of airborne radionuclides,
3. Internal dose from ingestion of:
   - Plant foods grown in the contaminated soil irrigated with contaminated water,
   - Meat and milk from livestock fed with contaminated fodder and water,
   - Drinking water from a contaminated well or pond,
   - Fish from a contaminated pond, and
   - Contaminated soil.

RESRAD has been widely accepted and has a large user base. The models used in the software were designed for and have been successfully applied at sites with relatively complex physical and contamination conditions. In addition, the software has been verified and validated (Yu, 1999; NUREG/CP-0163 [NRC, 1998]).

Deterministic analyses were performed for this dose assessment. Version 6.22 of RESRAD was used to conduct the analyses.

5.0 CONCEPTUAL MODEL

Highly conservative conceptual models were utilized to perform the dose analyses for the site. Different conceptual models were used for the eastern 3.5-acre and the western 2.6-acre areas because the source geometries for each area were different. In the case of the eastern 3.5-acre area, RRM is covered by a layer of clean fill and therefore RRM in this area may be considered buried RRM. Currently the 2.6-acre area is uncovered and RRM is present at the surface in this area. Key assumptions associated with the conceptual model for each area are summarized below.

<u>Conceptual Model for the 3.5-acre area</u>

- Although the Molycorp site currently is an industrial site and likely will remain as such, a more conservative resident gardener scenario was used for this analysis.

- The average depth of cover material in place on the eastern 3.5-acres is 4 to 6-feet. More conservative values of 2-feet and 4-feet of cover were used in the RESRAD modeling.

- This area was the subject of an intensive remedial program involving removal of approximately 50,000 cubic yards of soil. Excavation continued until bedrock was encountered or soil concentrations met the unrestricted use criteria provided in Section 3.0. Based on the exhaustiveness of the remedial effort, it is assumed that any RRM in this area exists in a thin band at the soil/bedrock interface. For this dose assessment, the contaminated zone was assumed to be 6-inches thick.

- The "Dual Simulation" approach suggested by NRC guidance (NUREG-1757, Volume 2, Appendices I and J) for buried RRM was employed for this area. To apply the Dual Simulation approach, it was assumed that a volume equivalent to the size of a basement was excavated and spread out over the surface to a depth of 6-inches. This approach leads to two different source concentrations, $Conc_1$ and $Conc_2$. $Conc_1$ represents radionuclides mixed with cover material and deeper clean material which have been excavated and spread out over the surface. $Conc_2$ represents the concentration of the remaining radionuclides left in place in the 6-inch buried layer. The two zones of RRM will not represent the same exposure to the hypothetical resident gardener and therefore require two simulations with RESRAD.

- Attachment A demonstrates that the shallow (upper) bedrock water bearing zone at the Molycorp site cannot be considered a usable drinking water aquifer for the following reasons:

  1. Kinzer limestone formation underlying most of the site has low permeability and wells completed in the formation have low specific capacity
  2. Similarly, water wells developed in Vintage dolomite formation have low specific capacity
  3. In general, carbonate bedrock in the site area have low porosity and permeability
  4. Groundwater flow through surficial soil appears to be very small.
  5. Shallow bedrock on-site has low potential for groundwater flow and is influenced by an upward hydraulic gradient and discharge from the underlying aquifer.
  6. The only two shallow bedrock wells that were not drawn dry in less than one hour are in the estimated zone of influence of the artesian well and artesian aquifer discharge into the shallow bedrock zone.
  7. The deep aquifer well is under artesian pressure originating in outcrops in hills south of the site. Artesian pressure causes natural flow from the deep well on-site and leakage of the water into the shallow groundwater zone, affecting the perched water table locally.
  8. The pressure gradient in the deep artesian aquifer prevents residual radioactive material near land surface from migrating into the deep aquifer.

  For all of the above reasons, the perched water and water in shallow bedrock could not reasonably be developed into a potable water well sufficient for a family to use. Water in the deep artesian aquifer is a better source of potable water and would be the rational choice for developing a potable water well on-site. Therefore, use of the groundwater that may be impacted by subsurface RRM as a residential drinking water source is highly unlikely and this pathway was eliminated from consideration in the dose analysis.

- For Simulation 1 of the Dual Simulation (i.e., RRM at $Conc_1$ for excavated material spread over the surface), exposure pathways applicable to a residential gardener scenario are direct radiation, inhalation of particles, plant ingestion, meat ingestion, milk ingestion, aquatic foods ingestion, drinking water and ingestion of soil particles. The 6.1-acre site is located in an urban setting and is surrounded by residential and commercial development. The site is zoned for industrial purposes and there is no land zoned for agricultural use in Spring Garden Township. Based on the site's small size, urban setting and zoning, meat ingestion and milk ingestion were eliminated as pathways for this analysis. Aquatic foods ingestion was eliminated as a pathway because no surface water bodies are present on the

site. The basis for eliminating drinking water as a pathway is discussed above. Irrigation pathways were eliminated because these pathways will be covered in Simulation 2. Infiltration rate and irrigation rate were set to zero to exclude irrigation pathways. Radon was excluded from this analysis. The Simulation 1 analysis included the following pathways: direct radiation, inhalation of soil, plant ingestion and ingestion of soil.

- For Simulation 2 of the Dual Simulation (i.e., RRM at $Conc_2$ for material left in place), exposure pathways applicable to a residential gardener scenario are plant ingestion, meat ingestion, milk ingestion, aquatic foods ingestion and drinking water. Based on the site's small size, urban setting and zoning, meat ingestion and milk ingestion were eliminated as pathways for this analysis. Aquatic foods ingestion was eliminated as a pathway because no surface water bodies are present on the site. The basis for eliminating drinking water as a pathway is discussed above. Radon was excluded from this analysis. For Simulation 2, plant ingestion was the only pathway included in the analysis.

<u>Conceptual Model for the 2.6-acre area</u>

- Although the Molycorp site currently is an industrial site and likely will remain as such, a more conservative resident gardener scenario was used for this analysis.

- The western 2.6-acre portion currently is not covered with imported clean fill. A 1400 cubic yard stockpile of clean fill is staged onsite and will be used to grade the site in the summer of 2004. This volume of clean fill is sufficient to provide 4-inches of cover over 2.6-acres. For this dose assessment three cover scenarios were evaluated. The first scenario for the 2.6 acres used no cover in the RESRAD modeling, the second scenario used a 4-inch thick clean fill cover and the third scenario used a 6-inch thick clean fill cover

- A Single Simulation approach was used because there is no cover on the 2.6-acre area and therefore there is no buried RRM.

- The pathways applicable to a residential gardener scenario are direct radiation, inhalation of particles, plant ingestion, meat ingestion, milk ingestion, aquatic foods ingestion, drinking water and ingestion of soil particles. The 6.1-acre site is located in an urban setting and is surrounded by residential and commercial development. The site is zoned for industrial purposes and there is no land zoned for agricultural use in Spring Garden Township. Based on the site's small size, urban setting and zoning, meat ingestion and milk ingestion were eliminated as pathways for this analysis. Aquatic foods ingestion was eliminated as a pathway because no surface water bodies are present on the site. The basis for eliminating drinking water as a pathway is discussed above. Radon was excluded from this

analysis. The analysis included the following pathways: direct radiation, inhalation of soil, plant ingestion and ingestion of soil.

6.0 MODEL INPUT

Different source terms were used for the eastern 3.5-acres and the western 2.6-acres. For the eastern 3.5-acres, the average contaminated zone concentrations (i.e., $Conc_2$ for Simulation 2) were assumed to equal 2.5-pCi/g each for U-238, U-234, Th-232, Th-228 and Ra-226. This is the concentration of each radionuclide assuming:

- the covered layer of RRM is homogenous and present at concentrations equivalent to a sum of fractions of unity and
- the unrestricted release criteria provided in Section 3.0 are the components of a sum of fractions

The contaminated zone was assumed to be 6-inches thick for the eastern 3.5-acres.

For the 3.5-acre area, $Conc_1$ was assumed to be 0.125-pCi/g each for U-238, U-234, Th-232, Th-228 and Ra-226. This was calculated by applying a mixing factor of 5 percent to $Conc_2$ to account for the blending of 2.85 meters of clean soil with 0.15 meters (6-inches) of contaminated soil when excavating a basement to a depth of 3-meters.

For the western 2.6-acres, the average net concentration values in Table 1 were used in the RESRAD model as the source term. It was assumed that the contaminated zone thickness was 3-meters.

Other site specific and model default input parameters are listed in Attachment B, together with justification as to why the parameter value was used.

7.0 RESRAD MODEL RESULTS

Using the conservative assumptions discussed above, the maximum TEDE to a residential gardener living on site and exposed to RRM via direct radiation, inhalation of soil, plant ingestion and soil ingestion would be 3.2 mrem/yr at 63 years. The following table presents the maximum TEDE for each scenario evaluated.

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TABLE 2
Maximum TEDE for each Scenario Evaluated

Scenario	Maximum Dose (mRem/yr)
2.6-acre area with no cover	2.7 @ 42 years
2.6-acre area with 4-inch cover	1.3 @ 78 years
2.6-acre area with 6-inch cover	1.0 @ 82 years
3.5-acre area with 2-foot cover[1]	3.2 @ 63 years
3.5-acre area with 4-foot cover[1]	1.9 @ 97 years

[1] Maximum Dose reported for 3.5-acre area is the sum of Maximum Doses for Simulations 1 and 2.

The following table summarizes each pathway and its corresponding percent dose contribution for the 2.6-acre area with no cover and the 3.5-acre area with a 2-foot cover.

TABLE 3
Dose Pathway Summary

Exposure Pathway	Dose Contribution 2.6-acre area with no cover	Dose Contribution 3.5-acre area with 2-foot cover
External Gamma	68%	47%
Inhalation	1%	1%
Plant Ingestion	30%	51%
Meat Ingestion	N/A	N/A
Milk Ingestion	N/A	N/A
Aquatic Foods	N/A	N/A
Drinking Water	N/A	N/A
Soil Ingestion	1%	1%
Radon	N/A	N/A

RESRAD model output is appended to this report (Attachment C).

It is reasonable to question whether radiological doses from adjacent land areas (i.e., the 2.6-acre area and the 3.5-acre area) are additive. Due to the urban nature of the site, residential plots likely would be small (< 1-acre) and therefore there is a low probability for someone living in a home on one of the parcels while maintaining a garden on the other parcel. If one assumes this is possible, the Maximum Dose would be 3.5 mRem/year assuming the worst case of an individual living on the 2.6-acre area and maintaining a garden on the 3.5-acre area. This dose is well below the 25 mRem/year guideline value.

8.0 SENSITIVITY ANALYSIS

Sensitivity analyses were conducted to identify the input parameters that are the major contributors to the variation or uncertainty in the calculated dose. Deterministic sensitivity analyses were performed by calculating the change in the peak dose resulting from a change in the independent variables, one at a time. Three scenarios were selected for sensitivity analysis:

- 2.6-acre area with no cover
- 2.6-acre area with 6-inch cover
- 3.5-acre area with 2-foot cover for Simulations 1 and 2

To conduct the sensitivity analysis, RESRAD input parameters were changed one at a time by scaling factors which ranged from 1.5 to 50. A scaling factor is a number by which the selected value of a parameter is (1) multiplied to estimate the change in dose or (2) divided by to estimate the change in dose. The detailed results of the sensitivity analysis are provided in Attachment D. Tables 4 and 5 summarize the results of the sensitivity analysis.

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TABLE 4
Sensitivity Analysis Summary for 2.6-acre Area

	2.6-acre area with no cover	2.6-acre area with 6-inch cover
Total parameters in RESRAD	157	157
# of parameters included in sensitivity analysis	54	58
Maximum dose due to a single parameter increase [1]	5.1 mRem/yr	3.1 mRem/yr
Maximum dose due to single parameter decrease [1]	2.7 mRem/yr	1.5 mRem/y
Parameters that resulted in > 10 percent increase in maximum dose	- Shielding Factor - external gamma - Fraction of time spent outdoors (on site) - Fruits, vegetables and grain consumption	- Cover depth - Density of cover material - Contaminated zone distribution coeff. For Ra-226 - Fruits, vegetables and grain consumption - Leafy vegetable consumption

[1] Maximum dose due to a single parameter increase (or decrease) refers to total resulting dose, not to an increment in dose.

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TABLE 5
Sensitivity Analysis Summary for 3.5-acre Area

	3.5-acre area with 2-foot cover Simulation 1	3.5-acre area with 2-foot cover Simulation 2
Total parameters in RESRAD	157	160
# of parameters included in sensitivity analysis	57	51
Maximum dose due to a single parameter increase [1]	2.8 mRem/yr	5.0 mRem/yr
Maximum dose due to single parameter decrease [1]	1.9 mRem/yr	1.4 mRem/y
Parameters that resulted in > 10 percent increase in maximum dose	- Shielding Factor - external gamma - Fraction of time spent indoors - Fraction of time spent outdoors (on site) - Fruits, vegetables and grain consumption	- Evapotranspiration Coefficient - Fruits, vegetables and grain consumption - Leafy vegetable consumption

[1] Maximum dose due to a single parameter increase (or decrease) refers to total resulting dose, not to an increment in dose.

Tables 4 and 5 indicate that the TEDE for each Scenario evaluated is well below the 25 mRem/yr guideline value even when the most sensitive model parameters are changed by a significant factor.

9.0 CONCLUSION

RRM that is present at the site does not pose an unacceptable dose/risk threat to an average member of the critical group. Dose estimates are well below the 25 mrem/year guideline value which supports an unrestricted release of the site.

10.0 REFERENCES

"Molycorp York Facility Decommissioning, Final Status Survey Release Record, Survey Area 1", Malcolm Pirnie, 2004.

"Molycorp York Facility Decommissioning, Final Status Survey Release Record, Survey Area 2", Malcolm Pirnie, 2004.

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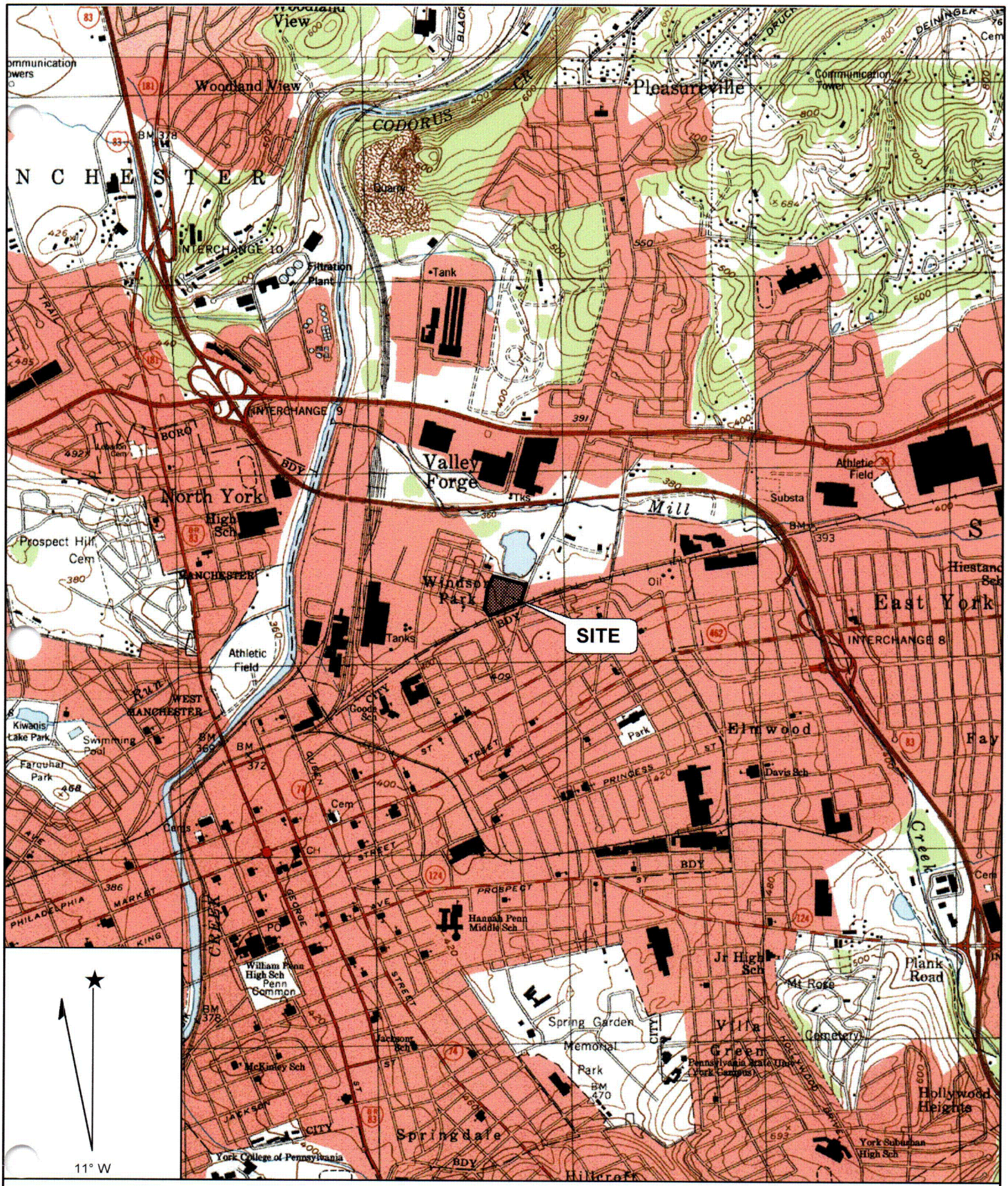

Name: YORK
Date: 6/25/2004
Scale: 1 inch equals 2000 feet

Location: 039° 58' 28.94" N 076° 42' 47.97" W
Caption: FIGURE 1
Molycorp York, PA
Site Location Map

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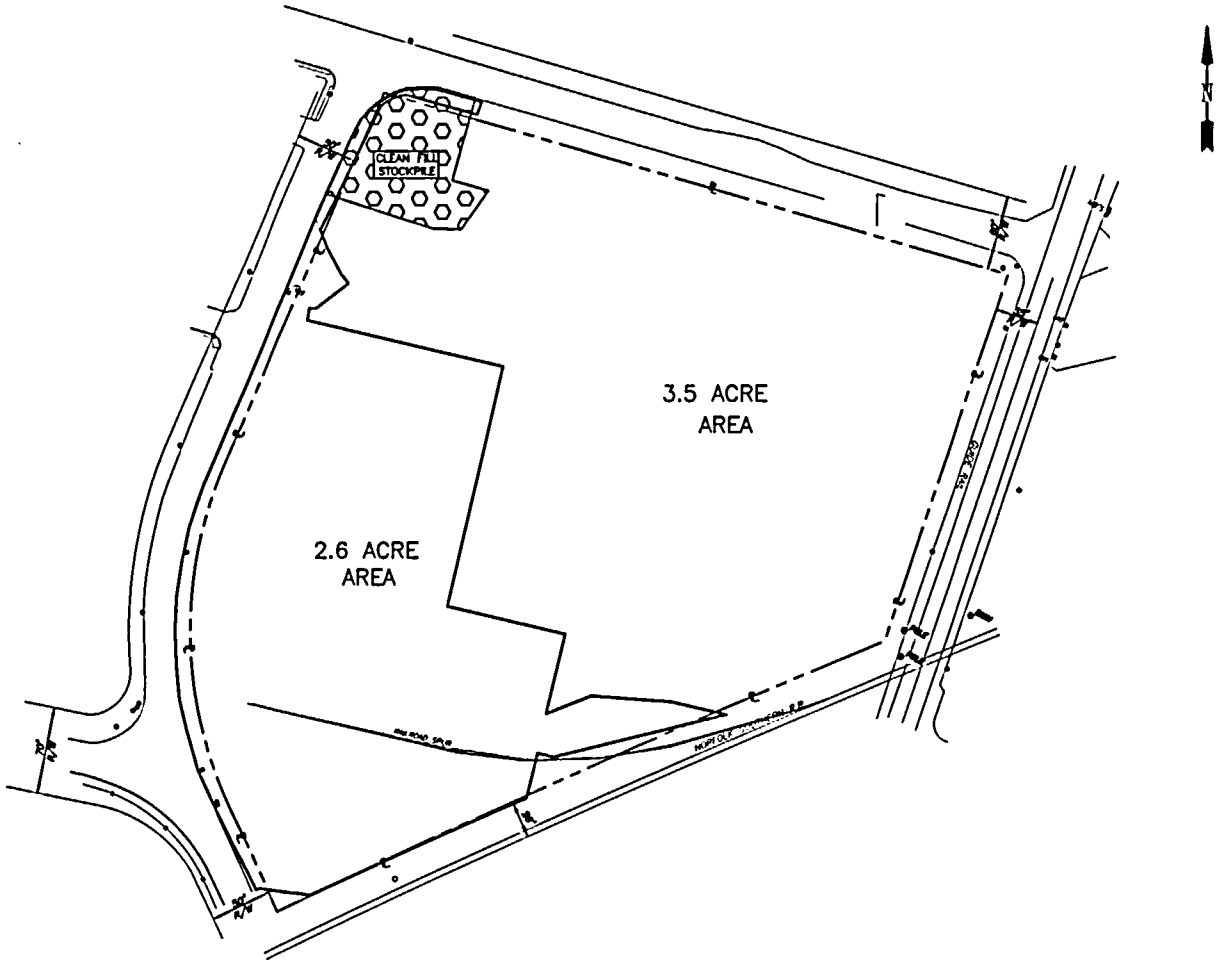
C01



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MOLYCORP, INC. FACILITY
YORK COUNTY, PENNSYLVANIA

FIGURE 2
SITE PLAN
1:150

MALCOLM PIRNIE, INC.
DATE MAY 2004
G SHEET 1 OF 1
CAD REF. NO. 4812012
DIRECTORY ABLSOIL

User:SIDARI Spec:PIRNIE STANDARD File:J:\Projects\4812002\CADD\4812G0012.DWG Scale:1:1 Date:05/25/2004 Time:08:12 Layout:Layout1

ATTACHMENT A

USABLE AQUIFER ANALYSIS

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Usable Aquifer Analysis

Analysis of the availability of groundwater in the bedrock formations underlying the Molycorp York, PA site was based on review of the following:

- Investigation of the Shallow Groundwater Aquifer at the Unocal 76 Molycorp, Inc. York, Pennsylvania Facility; Vail Engineering, Santa Fe, New Mexico, June 1990. ("1990 Vail Study")
- Supplemental Report of the Shallow Groundwater Aquifer at the Unocal 76 Molycorp, Inc. York, Pennsylvania Facility; Vail Engineering, Santa Fe, New Mexico, Revised May 4, 1994.
- Molycorp, Inc., a Unocal 76 Company, Supplemental Site Characterization Report of the York, PA Facility. Volume 1 of 2, Foster Wheeler Environmental Corporation, May 1995. ("1995 Foster Wheeler Study").
- Lloyd, Orville B., and Douglas J. Growitz, 1977. Ground-Water Resources of Central and Southern York County, Pennsylvania. Water Resources Report No. 42, Pennsylvania Geological Survey, 93 p. ("Report No. 42").
- Re-development information for eight existing upper bedrock monitoring wells at the site. ("2004 well re-development").

Relevant objectives of the Vail 1990 Study were to: 1) accurately map the water table surface in the plant area, 2) perform pump test on selected wells to evaluate overburden aquifer character and variability, and 3) make observations of the deep artesian well on site to determine effects of artesian pressure on groundwater regime and contaminant flow. Although bedrock formations were not specifically targeted in terms of groundwater characterization, information obtained from the shallow monitoring wells and well tests was useful in analyzing potential availability of the groundwater in bedrock.

The 1995 Foster Wheeler Study was prepared in support of a site decommissioning and decontamination (D&D) plan. In addition to extensive characterization of quantity and quality of shallow ("overburden") groundwater at the site, it included installation and sampling of eight shallow bedrock wells (wells screened only in the upper portion of bedrock).

The 2004 well re-development was performed by Malcolm Pirnie, Inc. to exclude potential impact of the apparently incomplete well development on quality of groundwater samples.

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General Hydrogeology

Lloyd and Growitz (1977) performed a regional geologic and hydrogeologic study of bedrock formations underlying the Molycorp site. These predominantly carbonate rocks in the larger York area are comprised of (from youngest to oldest) the Ledger, the Kinzers, and the Vintage Formation, all of Cambrian age. They constitute the north limb of the Wrightsville Syncline, cut by the Gnatstown Overthrust which crosses the plant site. The precise locations of the thrust and subsidiary fault are uncertain. The location illustrated on Figure A1 is based on lithologies observed in monitoring well cuttings and variations in water table elevation (Vail Engineering, 1990). The local structural geology and the lithologies of individual carbonate units in combination create a complex hydrologic regime in the immediate vicinity of the plant site.

Ledger Dolomite is preserved in a localized fault wedge north of Gnatstown Overthrust. It underlies the northernmost portion of the plant site (Figure A1). The Ledger consists of gray massive granular dolomite. Probably on the order of less than 100 feet of the Ledger is present at the plant site (Figure A2). Regional information presented in Report No. 42 indicates that the frequency of occurrence of permeable zones in the Ledger actually increases with depth, up to about 150 to 200 feet below land surface. Given the relatively thin section of the Ledger at the site, and the site-specific groundwater information collected in the monitoring wells (including in those screened only in the upper bedrock) north of the Gnatstown Overthrust Fault, the Ledger Dolomite in the northern portion of the site is not considered a productive aquifer.

Kinzers Formation underlies most of the Molycorp site south of the Gnatstown Overthrust and the accompanying fault (Figure A1). It consists of a lower shale member and two limestone members. Generally low permeability is prevalent in Kinzers. Report No. 42 qualifies Kinzers Formation as having the lowest specific capacities of water wells of all the aquifers studied – the median was 0.06 gpm/ft. It is estimated that the average well drilled 200 feet deep would yield about 2 gpm with 50 feet of drawdown after 24 hours of pumping.

Vintage Dolomite, which also includes fine-grained limestone at the top of the formation, crops out on the north side of the Gnatstown Overthrust, immediately north of the plant site (Figures A1 and A2). The total regional thickness of the Vintage has been estimated to be on the order of 1400 feet. The median one-hour specific capacity of wells drilled in the Vintage was 0.16 gpm/ft (Report No. 42). Most water-bearing zones occur between land surface and about 200 feet below land surface. In general, this unit has low permeability and low potential as an aquifer.

Site Hydrogeology

During 1990 investigations (Vail Engineering, 1990), 18 test holes (T-1 through T-18) were drilled at the site, mainly in the central and eastern portions of the site ("the Plant area" – see Figure A3). The boreholes were drilled with the 6 inch boring diameter and a 4 inch perforated PVC drain pipe was temporary inserted for test pumping and sampling. All temporary test wells were screened across the overburden, consisting of fill and surficial sediments, and the upper portion of the bedrock which, in most cases, consisted of limestone and dolomite according to driller's logs. Fifteen wells were 20 feet deep each, with the bottom portion completed in the bedrock varying between 2 and 10 feet thick. One well (T-5) was 30 feet deep, with the bottom 5 feet in limestone. Well T12 was 40 feet deep, with 38 feet of predominantly clay and 2 feet of limestone. Well T-13 was 32 feet deep, with 31 feet of clay and only 1 foot of limestone. Water withdrawn from these 18 test wells, during development and subsequent testing, was coming from both the overburden and the shallow bedrock water bearing zones.

Groundwater sampling and pumping tests were also performed at five existing monitoring wells (MW-1 through MW-5) for which boring logs and some construction details were available, and at three existing wells without boring or construction information (X, Y and 4A). MW-1 was 20 feet deep, with the bottom 11 feet in limestone, MW-2 was also 20 feet deep, with the bottom 2 feet in limestone, MW-3 was 25 feet deep with 12 feet in limestone, MW-4 was 20 feet deep with 5 feet in limestone, and MW-5 was 25 feet deep with 10 feet in dolomite and limestone. It appears that the well screens of MW-1 through MW-5 were set across the entire depth of the wells, although this could not be verified. All monitoring wells (both permanent and temporary) were tested for yield. Water level measurements in the wells were taken multiple times during several pumping tests that included monitoring for a potential influence from a deep artesian well, located in the east-central portion of the Plant site (see further text for more explanation).

General conclusion of the 1990 Vail Study was that rocks in the area have low porosities and permeabilities and that groundwater flow appears to be very small through the surficial soils and imported soil materials. Based on the topography, the drainage area which contributed to the shallow groundwater flow through the plant area probably did not extend over more than 4.6 acres. In Report No. 42, Lloyd and Growitz determined that the average infiltration to groundwater from precipitation was on the order of 14 inches per year. Such would produce an average shallow groundwater flow through the entire plant area of approximately 3.3 gpm.

Artesian Conditions

A considerable artesian pressure was observable at the Plant site during the 1990 investigations. This pressure evidently originates from confined aquifer zones in

Cambrian and Ordovician outcrops in the hills to the south of the Molycorp site (Vail Engineering, 1990). The plant site is known to have been marshy before construction of additional buildings and asphalt paving in the 1980s. An artesian well in the old marsh area was pumped continuously to control the water table elevation in the treatment plant area.

The main conclusion of the 1990 Vail Study was that the deep artesian well at the plant site has dominant effect on the shallow ground water flow in the area. No written documentation regarding construction of the artesian well was available. However, Mr. Shoemaker, a long time employee of Molycorp, communicated that in mid 1960s a high ground water table caused extensive problems with maintenance of some partially buried tanks in the area of the treatment plant. In an attempt to relieve this problem, an excavation was made to see if the area could be drained. During the excavation, a significant slab of rock (presumably limestone) was dislodged and the water flow significantly increased. It was believed that this was still shallow groundwater and, in consideration of the water table at the nearby quarry, the actual water table was considerably deeper. Based on this theory, a four inch diameter hole was drilled to a depth of over 200 feet in an attempt to drain the shallow groundwater. However, the opposite effect occurred and an even greater flow and higher hydraulic head resulted from the well. Subsequently, Molycorp constructed a sump over the well. The deep water well sump was an open concrete box approximately 4 feet x 6 feet with a depth of about 8 feet. The four inch well presumably is located somewhere in the bottom of the sump. Apparently, the well was completed without casing and a grout seal. The sump at the top of this well was not sealed and water flowed freely from the sump to the shallow groundwater aquifer. Water was pumped from the sump at the rate of 10 gpm to keep the adjacent shallow groundwater level from becoming too high. Often the natural flow from the deep well was in excess of the 10 gpm being pumped and this excess was adding to the shallow groundwater flow. These conditions existed at the time of the 1990 Vail field investigations. According to the information analyzed by Vail Engineering, the historical data indicated that similar conditions prevailed much of the time.

Analysis of the site-wide groundwater level measurements during various intervals of turning on and off the deep well sump pump indicated that the higher hydraulic head in the artesian aquifer probably resulted in some migration of water from the deep aquifer to the shallow aquifer in addition to that directly contributed by excess flow from the deep well. The data also indicated that leakage from the deep aquifer to the shallow aquifer occurred primarily in the central and eastern parts of the plant area (Figure A4). The continuing presence of a natural flow from the deep well over many years, including at the present (i.e., following the soil remediation at the site) and chemical analyses of the artesian well water indicate that Molycorp's operations have not had an affect on the flow and quality of groundwater in the deep aquifer. In consideration of such, the 1990 Vail Study was primarily limited to the shallow (overburden) water bearing zone above the carbonate bedrock formations.

Shallow Groundwater Zone

Monitoring well data from 1990 show general direction of the shallow groundwater flow towards north-northwest, i.e., towards the abandoned limestone quarry located immediately north of the Molycorp site. The water table in the quarry was approximately 34 feet below the surface elevation at the plant site, or about 30 feet lower than the water table over most of the site. Potentiometric maps and water level measurements in the 1990 Vail Report show two general areas with varying hydraulic gradients - north and south of the Gnatstown Overthrust (see Figure A2). The gradient north of the overthrust/fault is much steeper reflecting both the lower permeability of the porous material and the lower elevation of the quarry lake which is most likely the discharge zone. Soil borings in the area of the overthrust indicate existence of a clay zone along the fault which evidently acts as an aquitard. The origin of this clay zone is possibly the shale member of the Kinzers which could have locally acted as a glide plane for the thrust. Hydraulic gradients south of the overthrust are much lower and are likely reflecting, at least to some extent, contribution of groundwater from the artesian aquifer and the deep well. In addition, in the general area of the Old Pond, the observed flat hydraulic gradient was a direct result of the highly permeable material used to fill in the pond.

Figure A5 shows distribution of well yields for the 1990 monitoring wells which were estimated based on well pumping tests and other information included in the 1990 Vail Study. It is indicative that most of the wells with somewhat higher yields (e.g., > 1 gpm) were located in the estimated zone of influence of the artesian well (e.g., T-17, T-18, MW-5) and/or in the area influenced by the Old Pond (e.g., T-3, T-1, and the downgradient wells MW-3 and T-11). The Old Pond area probably acted as a local drainage zone for the shallow groundwater flow due to its high permeability.

Shallow Bedrock Water Bearing Zone

Figure A6 shows historic and current locations of the monitoring wells screened only in the shallow (upper) bedrock. Although the bedrock wells were not specifically tested for their yield, the available information from the characterization of the shallow water table zone, the regional aquifer analysis, water level measurements in the bedrock wells (see Figure A7), and well re-development data (see Table A1) provide sufficient information for characterization of the groundwater potential in shallow bedrock. Both the 1990 Vail Study and the 1995 Foster Wheeler Study, which focused primarily on the overburden water bearing zone, concluded that the shallow bedrock aquifer at the site has low potential for groundwater flow and is influenced by the clay aquitard associated with the Gnatstown Overthrust, and the upward groundwater discharge from the underlying artesian aquifer. For example, the Foster Wheeler upper bedrock well K-1, located in the Old Pond area, strongly responded to pumping of a close by overburden test well PW-1.

The similarity in water levels and the response in each adjacent well during development of cluster wells at K-2, K-3 and K-4 (information from the 1995 Foster Wheeler Study; see Figure A6) show that the water table and upper bedrock water bearing zones are interconnected in the southern, south-central, and eastern areas of the site. In other words, the shallow bedrock groundwater zone is part of a localized, low permeable shallow system with the total site-wide groundwater flow on the order of several gallons per minute. It is interesting that the 1995 Foster Wheeler Study estimated the total shallow groundwater flow at the site to be 3.44 gpm, or about the same as calculated in the 1990 Vail Study (3 gpm), but using an independent data from the new 1995 test wells.

The April 17, 1995 potentiometric map of the upper bedrock aquifer (Figure A7) shows very similar groundwater flow characteristics to those observed in the shallow groundwater zone during the 1990 Vail investigations. The hydraulic gradients south of the overthrust/fault area are generally flat while north of it they are much steeper reflecting the low permeable clayey zone and the vicinity of the quarry lake. The 2004 well re-development data (Table A1) shows that the bedrock wells north of the overthrust zone (V-2 and V-3) are developed dry in less than an hour with a pumping rate of only 1 gpm. Similarly, the background well K-3, in the far southwestern corner of the site, and well K-5, were also developed dry in less than one hour with the pumping rates of 1 and 2 gpm respectively. Well K-1 developed a drawdown of about 20 feet during re-development and removal of approximately 250 gallons of water. The only two bedrock wells that were not developed dry or did not exhibit an excessive drawdown during the limited re-development water withdrawal, are K-4 and K-6. These two wells are located in the estimated zone of influence of the artesian well and the artesian aquifer discharge into the shallow bedrock zone (see Figure A6) which explains their different characteristics.

Conclusion

The shallow (upper) bedrock water bearing zone at the Molycorp York, PA site cannot be considered as a usable drinking water aquifer. The only usable aquifer at the site is the deep artesian aquifer developed in the carbonate rocks below the clay aquitard associated with the Gnatstown Overthrust.

MALCOLM PIRNIE

Table A1 Water Level Observations during Monitoring Well Re-Development
Molycorp York Facility
York Pennsylvania

Monitoring Well ID	Pumping Rate	1-foot of Drawdown	Well Development Observations
K-1	2 gal/min	20 seconds[1]	removed 250 gallons and dropped water level 19.89 feet
K-2	1 gal/min	240 seconds	removed 190 gallons and dropped water level 11.65 feet
K-3	1 gal/min	53 seconds	developed dry in 48 minutes
K-4	2 gal/min	180 seconds	removed 250 gallons and dropped water level 5.25 feet[2]
K-5	2 gal/min	35 seconds	developed dry in 48 minutes
K-6	1 gal/min	30 seconds	removed 190 gallons and only dropped water level 10.68 feet
V-2	1 gal/min	not measured	developed dry in 12 minutes
V-3	1 gal/min	20 seconds	developed dry in 51 minutes

Footnotes:

1) After an initial rapid drop (19.18 feet in the first ten minutes) the water level dropped an additional 0.71 feet over the next 120 minutes.

2) During the development of this well, the water level dropped down to 10.89 ft below toc after 70 minutes of pumping and then recovered to 7.49 ft below toc.

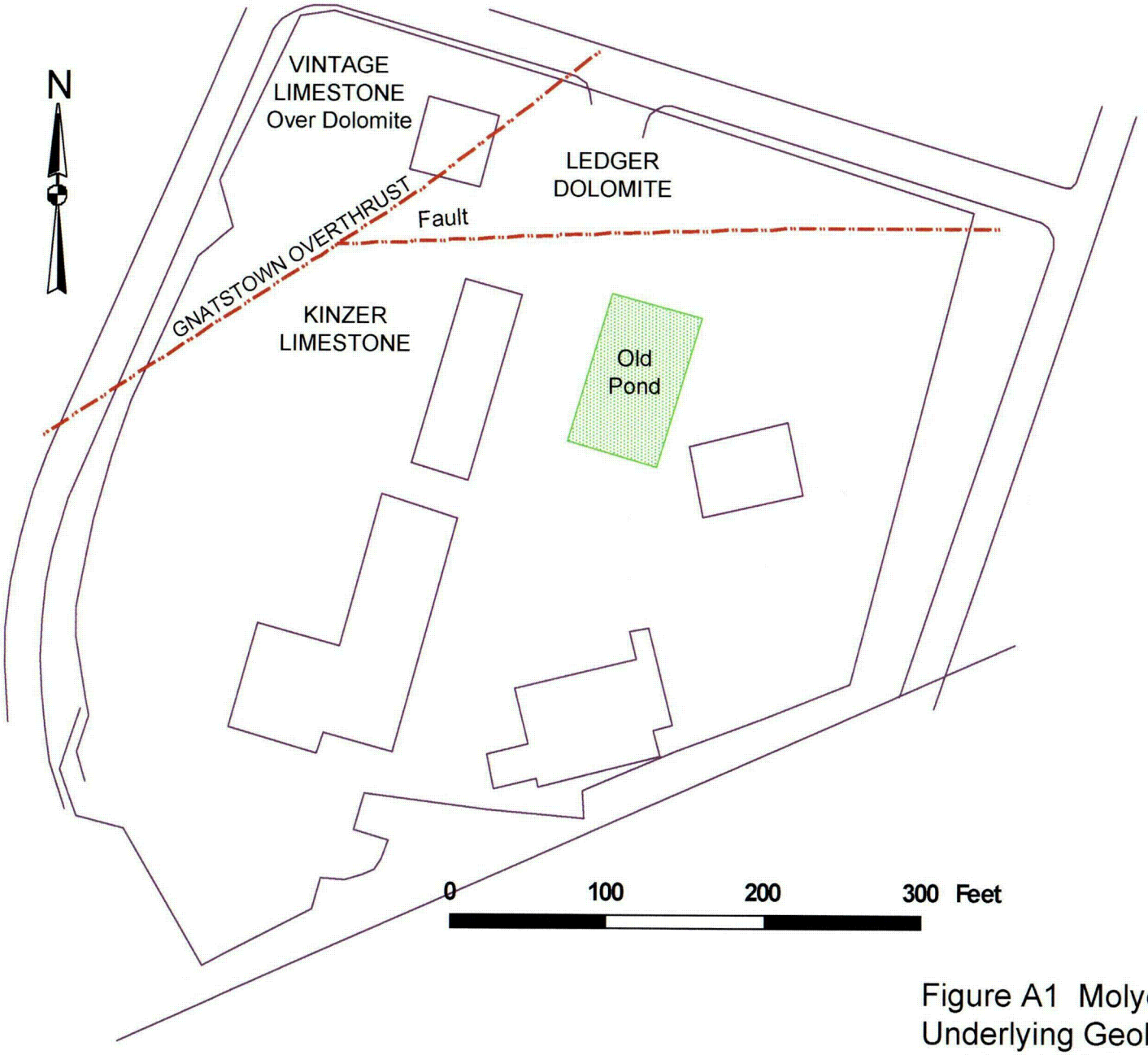

Figure A1 Molycorp, York, PA Site Layout and Underlying Geology (Vail Engineering, 1990, and Foster Wheeler, 1995)

C02

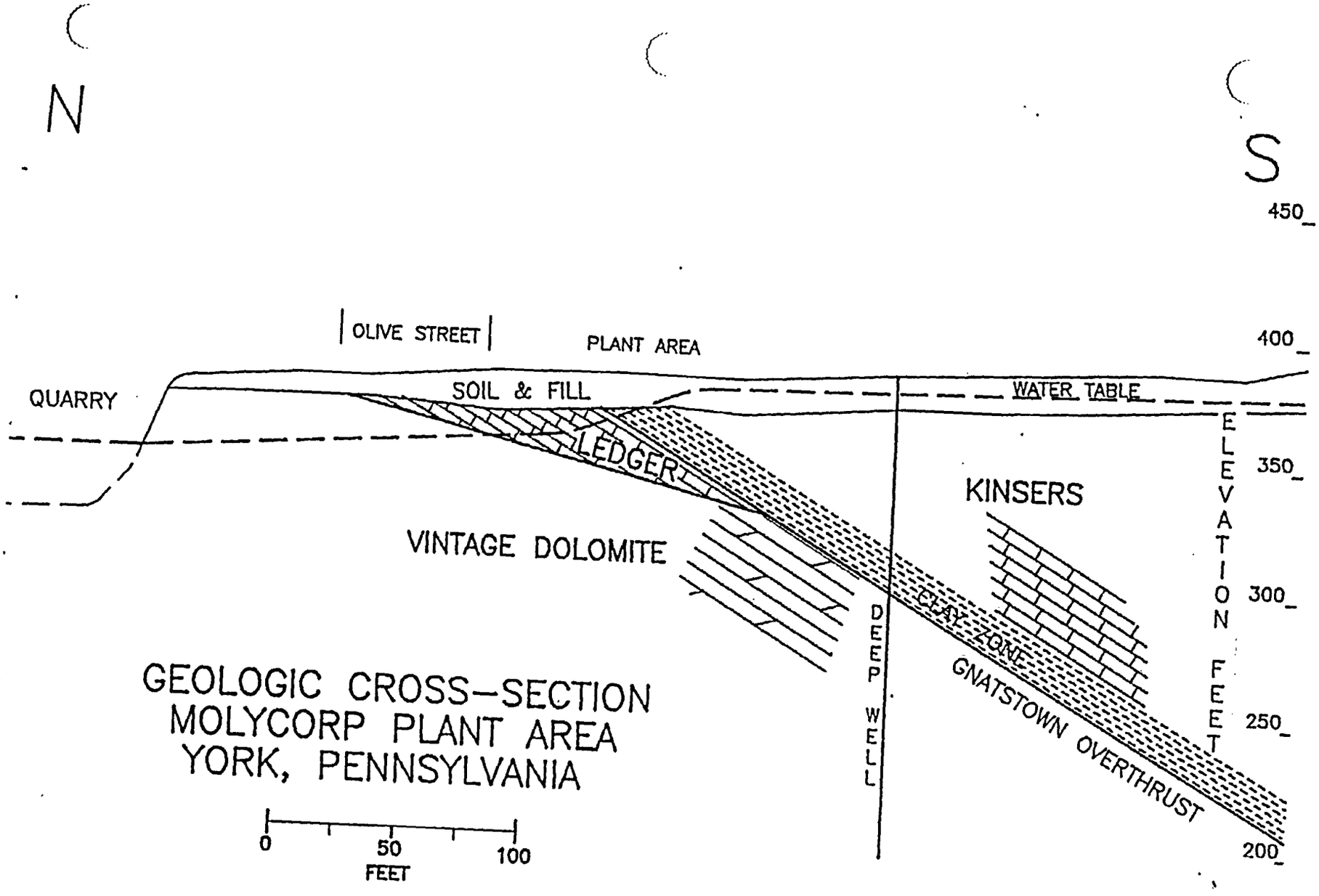

Figure A2 Schematic Geologic Cross Section
(Vail Engineering, 1990)

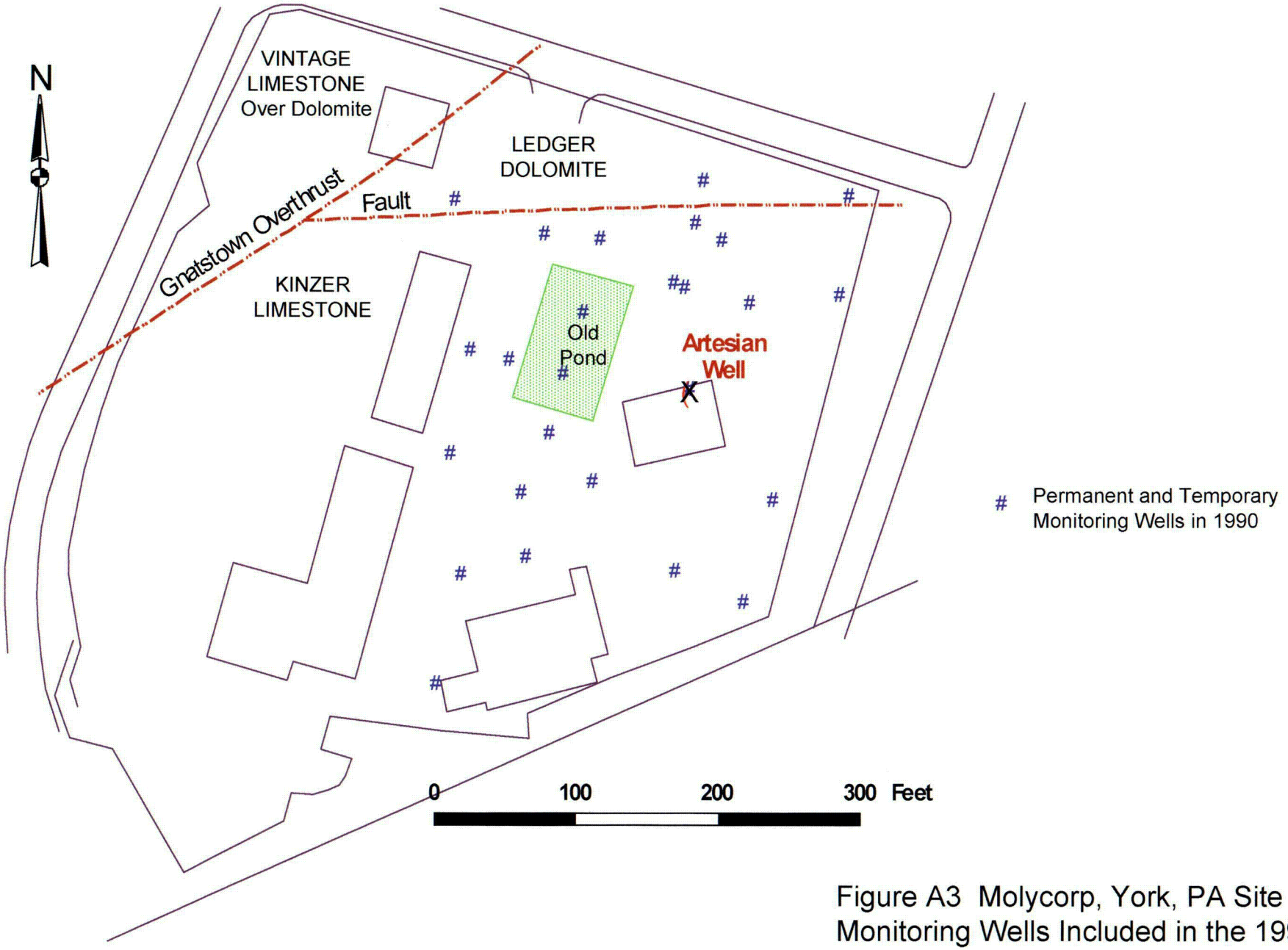

Figure A3 Molycorp, York, PA Site
Monitoring Wells Included in the 1990 Study
(Data Source: Vail Engineering, 1990).

C03

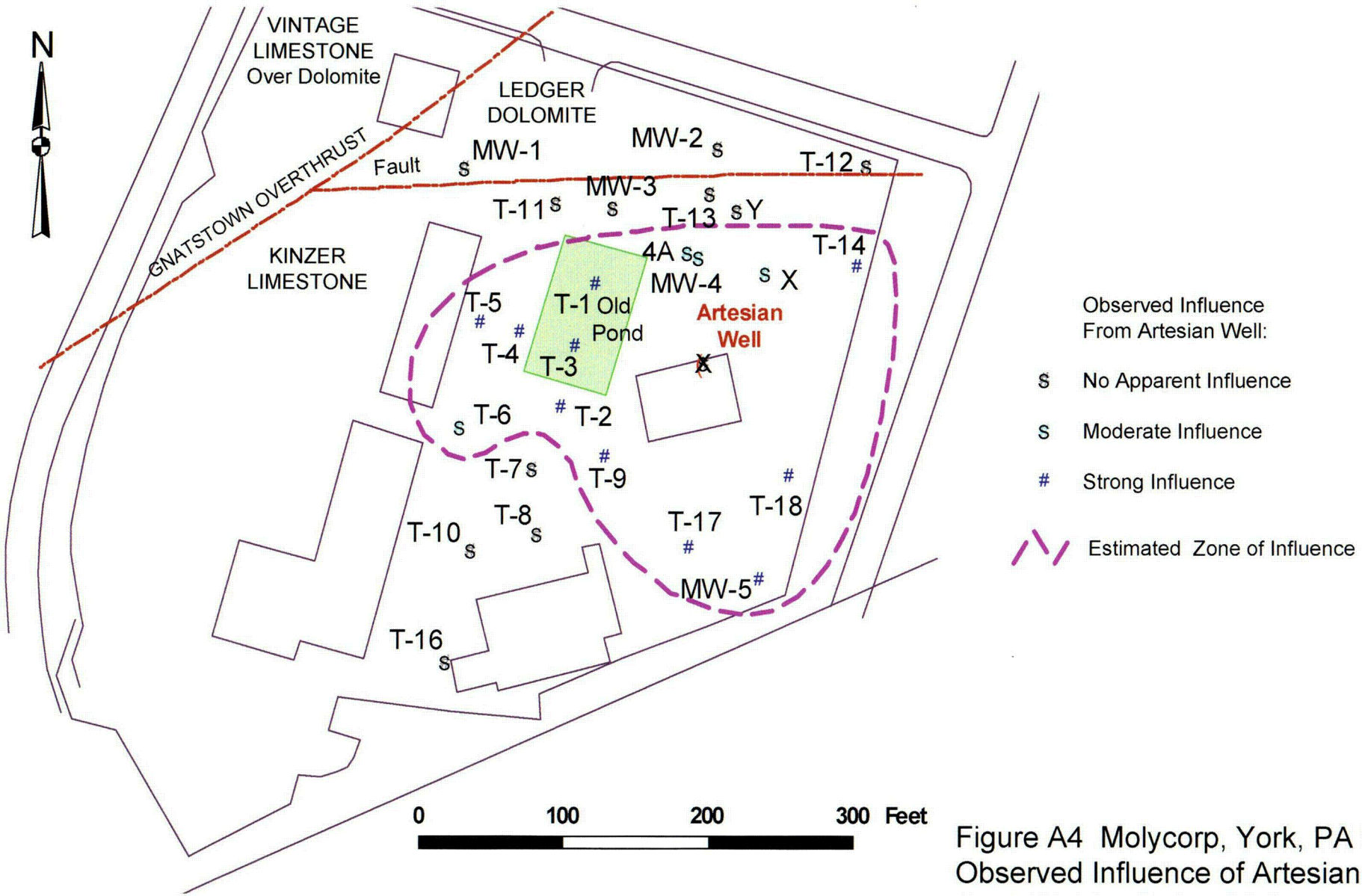

Figure A4 Molycorp, York, PA Site
Observed Influence of Artesian Well
On 1990 Monitoring Wells
(Data Source: Vail Engineering, 1990)

C04

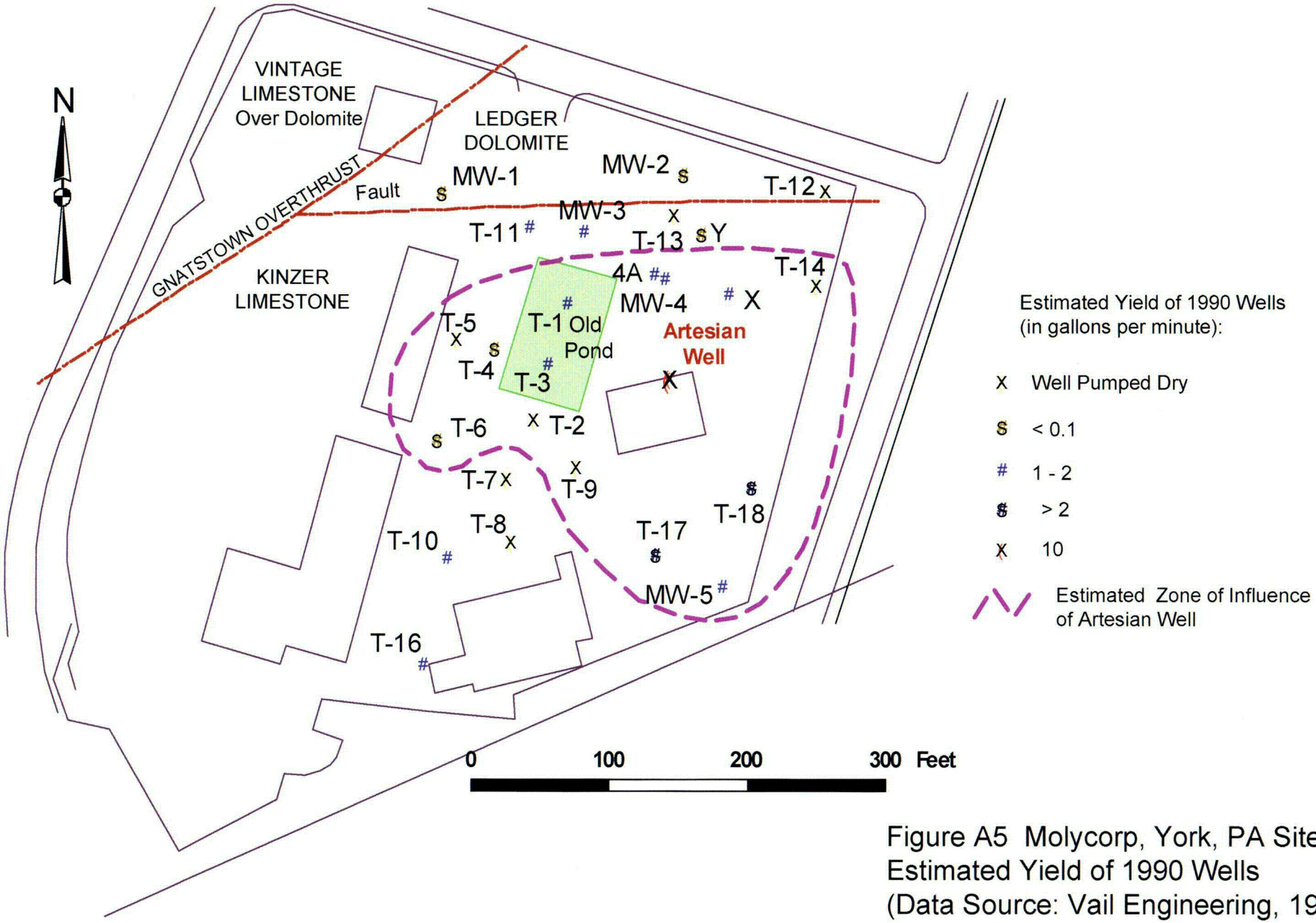

Figure A5 Molycorp, York, PA Site
Estimated Yield of 1990 Wells
(Data Source: Vail Engineering, 1990)

C05

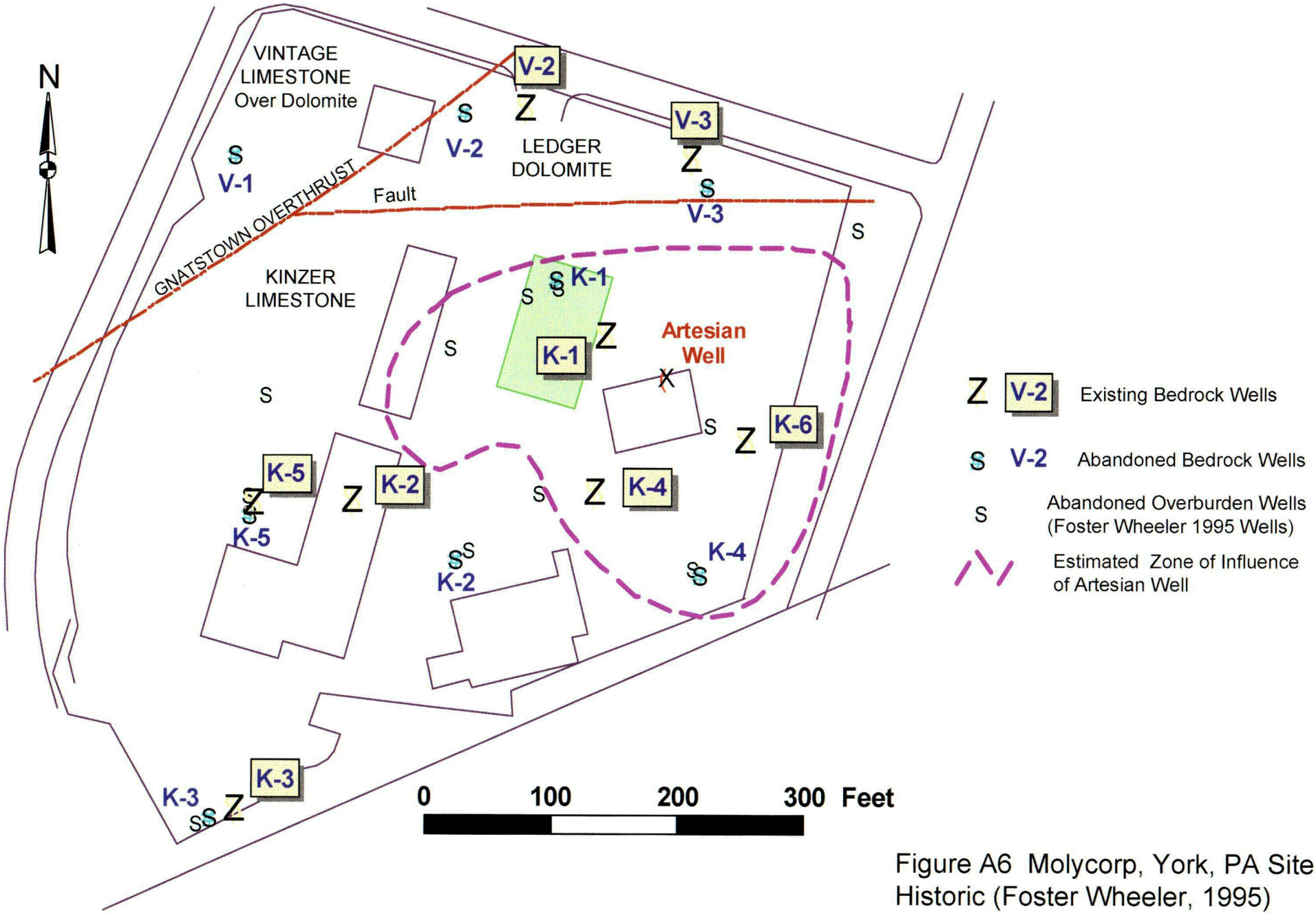

Figure A6 Molycorp, York, PA Site
Historic (Foster Wheeler, 1995)
and Current Shallow Bedrock Wells.

C06

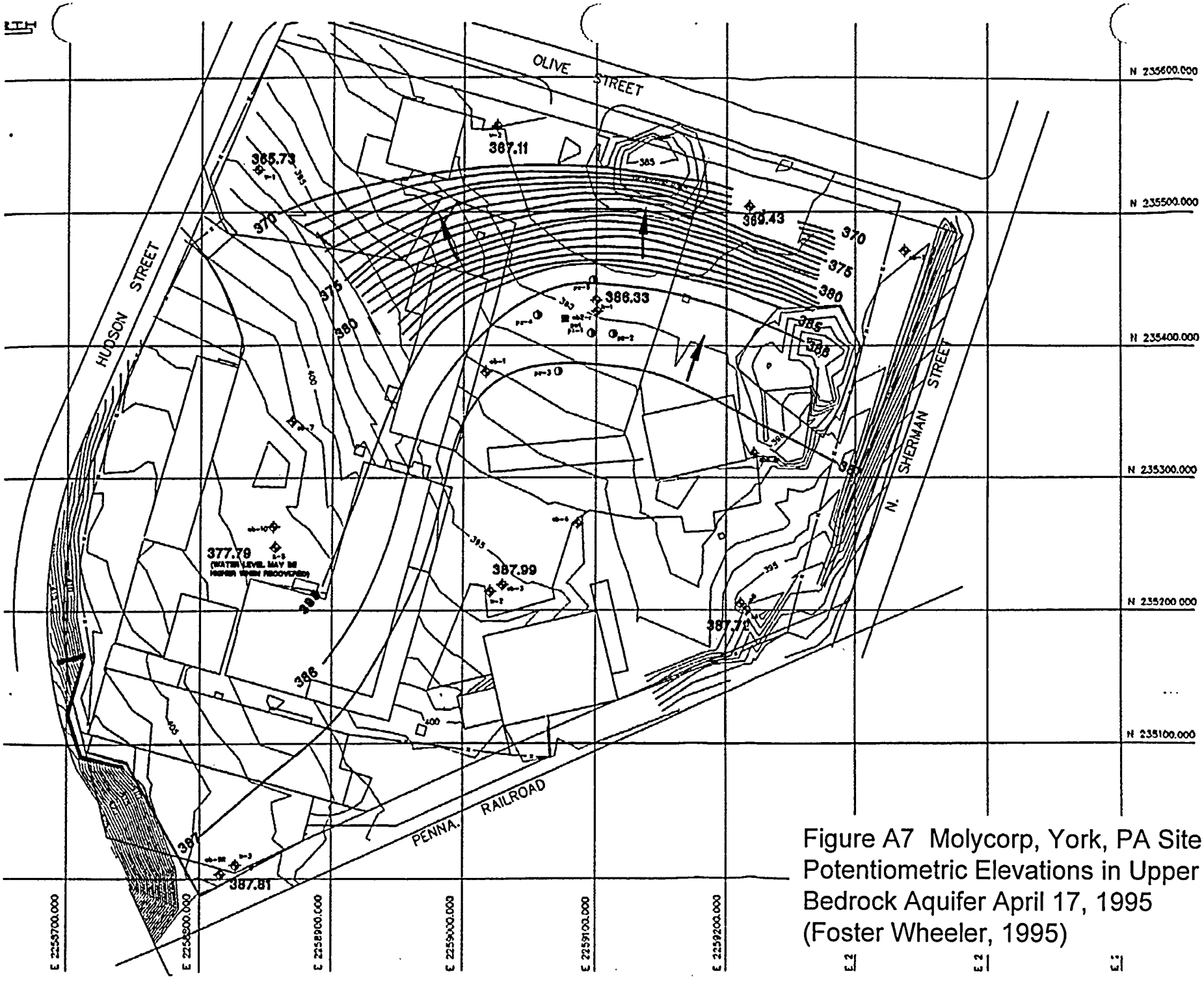

Figure A7 Molycorp, York, PA Site Potentiometric Elevations in Upper Bedrock Aquifer April 17, 1995 (Foster Wheeler, 1995)

ATTACHMENT B

RESRAD PARAMETER INFORMATION

RESRAD PARAMETER TABLE

2.6–ACRE AREA

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

Scenario	Res. Gardener	Res. Gardener
Applicable Pathways		
External Gamma	X	X
Inhalation	X	X
Plant Ingestion	X	X
Meat Ingestion		
Milk Ingestion		
Aquatic Foods		
Drinking Water		
Soil Ingestion	X	X
Radon		
Find Peak Pathway Doses	X	X

RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
Contaminated Zone	Area of contaminated zone (m^2)	1.000E+04	1.052E+04	1.052E+04	AREA	2.6 acres (= 10,521 square meters).
	Thickness of contaminated zone (meters)	2.000E+00	3.000E+00	3.000E+00	THICK0	The thickness of contaminated zone is the average depth of material where samples show elevated concentrations (3 meters).
	Length parallel to aquifer flow (m)	1.000E+02	1.030E+02	1.030E+02	LCZPAQ	The square root of the contaminated zone area was used.
Soil Concentrations	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	2.500E+01	BRDL	NRC guideline of 25 mrem/yr
	Time since placement of material (yr)	0.000E+00			TI	R3 explains that when radiological surveys are used to derive soil guideline information such as soil/water distribution coefficients, soil radionuclide concentrations and so forth, the elapsed time of waste placement is considered zero.
Calculation Times	Times for calculations (yr)	1.000E+00	1.000E+00	1.000E+00	T(2)	NA
	Times for calculations (yr)	3.000E+00	3.000E+00	3.000E+00	T(3)	NA
	Times for calculations (yr)	1.000E+01	1.000E+01	1.000E+01	T(4)	NA
	Times for calculations (yr)	3.000E+01	3.000E+01	3.000E+01	T(5)	NA

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Times for calculations (yr)	1.000E+02	1.000E+02	1.000E+02	T(6)	NA
	Times for calculations (yr)	3.000E+02	3.000E+02	3.000E+02	T(7)	NA
	Times for calculations (yr)	1.000E+03	1.000E+03	1.000E+03	T(8)	NA
Soil Concentrations	Initial principal radionuclides (pCi/g): Ra-226	0.000E+00	3.600E-01	3.600E-01	S1(4)	The average concentration of all subsurface soil samples taken as part of the characterization activities was used.
	Initial principal radionuclides (pCi/g): Th-228	0.000E+00	0.000E+00	0.000E+00	S1(7)	The average concentration of all subsurface soil samples taken as part of the characterization activities was used.
	Initial principal radionuclides (pCi/g): Th-232	0.000E+00	0.000E+00	0.000E+00	S1(8)	The average concentration of all subsurface soil samples taken as part of the characterization activities was used.
	Initial principal radionuclides (pCi/g): U-234	0.000E+00	6.800E-01	6.800E-01	S1(10)	The average concentration of all subsurface soil samples taken as part of the characterization activities was used.
	Initial principal radionuclides (pCi/g): U-238	0.000E+00	6.800E-01	6.800E-01	S1(11)	The average concentration of all subsurface soil samples taken as part of the characterization activities was used.
Cover/Hydrology	Cover depth (m)	0.000E+00	0.000E+00	See Parameter Justification	COVER0	4 inch cover = 0.1016 meters. 6" cover = 0.15 meters.
	Density of cover material (g/cm^3)	1.500E+00	1.630E+00	1.630E+00	DENSCV	Average soil density taken from site characterization activities.
	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-04	1.000E-04	VCV	R3 Section 14, suggests a 1E-05 to 6E-05 m/yr rate for a permanent pasture area times a factor of 3 for a 5% slope. Average of 1E-05 to 6E-05 = 3.5E-05. 3.5E-05 * 3 = .0001
	Density of contaminated zone (g/cm^3)	1.500E+00	1.630E+00	1.630E+00	DENSCZ	Average soil density taken from site characterization activities.
	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-04	1.000E-04	VCZ	R3 Section 14, suggests a 1E-05 to 6E-05 m/yr rate for a permanent pasture area times a factor of 3 for a 5% slope. Average of 1E-05 to 6E-05 = 3.5E-05. 3.5E-05 * 3 = .0001.
	Contaminated zone total porosity	4.000E-01	4.000E-01	4.000E-01	TPCZ	The default value was used.
	Contaminated zone field capacity	2.000E-01	2.000E-01	2.000E-01	FCCZ	The default value was used.
	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	1.000E+01	HCCZ	The default value was used.

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Contaminated zone b parameter	5.300E+00	5.300E+00	5.300E+00	BCZ	The default value was used.
	Average annual wind speed (m/sec)	2.000E+00	3.130E+00	2.000E+00	WIND	National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC) wind speed for central PA. 7 mph = 3.13 m/s. This value is assumed to be representative since it was based on 29 years of annual data obtained by NOAA for Central PA .
	Humidity in air (g/cm^3)	8.000E+00	not used	not used	HUMID	NA - This parameter is only used when Tritium (H-3) is a principal radionuclide.
	Evapotranspiration coefficient	5.000E-01	5.000E-01	5.000E-01	EVAPTR	The default value was used.
	Precipitation (m/yr)	1.000E+00	1.016E+00	1.016E+00	PRECIP	National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC) precipitation rates for PA. 40 in/yr = 1.016 m/yr. This value is assumed to be representative since it was based on 29 years of annual data obtained by NOAA for Central PA .
	Irrigation (m/yr)	2.000E-01	2.000E-01	2.000E-01	RI	The default value was used.
	Irrigation mode	overhead	overhead	overhead	IDITCH	Default
	Runoff coefficient	2.000E-01	2.000E-01	2.000E-01	RUNOFF	The default value was used.
	Watershed area for nearby stream or pond (m^2)	1.000E+06	1.000E+06	1.000E+06	WAREA	The default value of 1,000,000 m^2 was used.
	Accuracy for water/soil computations	1.000E-03	1.000E-03	1.000E-03	EPS	NA
Saturated Zone	Density of saturated zone (g/cm^3)	1.500E+00	1.630E+00	1.630E+00	DENSAQ	Average soil density taken from site sampling in trenches along seam in 2001.

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Saturated zone total porosity	4.000E-01	4.000E-01	4.000E-01	TPSZ	The default value was used.
	Saturated zone effective porosity	2.000E-01	2.000E-01	2.000E-01	EPSZ	The default value was used.
	Saturated zone field capacity	2.000E-01	2.000E-01	2.000E-01	FCSZ	The default value was used.
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	1.000E+02	HCSZ	The default value was used.
	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	2.000E-02	HGWT	The default value was used.
	Saturated zone b parameter	5.300E+00	5.300E+00	5.300E+00	BSZ	The default value was used.
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	1.000E-03	VWT	The default value was used.
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	1.000E+01	DWIBWT	The default value was used.
	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	ND	MODEL	Non-dispersion option was selected since area > 1,000 m2
	Well pumping rate (m^3/yr)	2.500E+02	2.500E+02	2.500E+02	UW	The default value was used.
Unsaturated	Number of unsaturated zone strata	1	0.000E+00	0.000E+00	NS	There are no unsaturated zones.
	Unsat. zone 1, thickness (m)	4.000E+00	not used	not used	H(1)	NA

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Unsat. zone 1, soil density (g/cm^3)	1.500E+00	not used	not used	DENSUZ(1)	NA
	Unsat. zone 1, total porosity	4.000E-01	not used	not used	TPUZ(1)	NA
	Unsat. zone 1, effective porosity	2.000E-01	not used	not used	EPUZ(1)	NA
	Unsat. zone 1, field capacity	2.000E-01	not used	not used	FCUZ(1)	NA
	Unsat. zone 1, soil-specific b parameter	5.300E+00	not used	not used	BUZ(1)	NA
	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	not used	not used	HCUZ(1)	NA
Soil Concentrations - Transport	Distribution coefficients for Ra-226					
	Contaminated zone (cm^3/g)	7.000E+01	7.000E+01	7.000E+01	DCNUCC( )	The default value was used.
	Unsaturated zone (cm^3/g)	7.000E+01	7.000E+01	7.000E+01	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	7.000E+01	7.000E+01	7.000E+01	DCNUCU( )	The default value was used.
	Leach rate (/yr)	0.000E+00	0.000E+00	0.000E+00	ALEACH( )	Calculated by model
	Solubility constant	0.000E+00	0.000E+00	0.000E+00	SOLUBK( )	Supplied by model
	Distribution coefficients for Th-228					
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	6.000E+04	DCNUCC( )	The default value was used.

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	6.000E+04	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	6.000E+04	DCNUCU( )	The default value was used.
	Leach rate (/yr)	0.000E+00	0.000E+00	0.000E+00	ALEACH( )	Calculated by model
	Solubility constant	0.000E+00	0.000E+00	0.000E+00	SOLUBK( )	Supplied by model
	Distribution coefficients for Th-232					
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	6.000E+04	DCNUCC( )	The default value was used.
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	6.000E+04	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	6.000E+04	DCNUCU( )	The default value was used.
	Leach rate (/yr)	0.000E+00	0.000E+00	0.000E+00	ALEACH( )	Calculated by model
	Solubility constant	0.000E+00	0.000E+00	0.000E+00	SOLUBK( )	Supplied by model
	Distribution coefficients for U-234					
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	5.000E+01	DCNUCC( )	The default value was used.
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	5.000E+01	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	5.000E+01	DCNUCU( )	The default value was used.
	Leach rate (/yr)	0.000E+00	0.000E+00	0.000E+00	ALEACH( )	Calculated by model
	Solubility constant	0.000E+00	0.000E+00	0.000E+00	SOLUBK( )	Supplied by model
	Distribution coefficients for U-238					
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	5.000E+01	DCNUCC( )	The default value was used.
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	5.000E+01	DCNUCC( )	The default value was used.

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	5.000E+01	DCNUCU( )	The default value was used.
	Leach rate (/yr)	0.000E+00	0.000E+00	0.000E+00	ALEACH( )	Calculated by model
	Solubility constant	0.000E+00	0.000E+00	0.000E+00	SOLUBK( )	Supplied by model
Occupancy	Inhalation rate (m^3/yr)	8.400E+03	1.226E+04	1.226E+04	INHALR	The value of 1.4 m^3/hr was referenced from R5 Page 5-19 as a typical adult male breathing rate. Comparing this value to R3 Section 43, shows that 1.4 m^3/hr (12,264 m^3/yr) it is more conservative than the EPA (1990) referenced value of 11,000 m^3/yr for the reasonable worst-case inhalation rate where activity patterns are not known. A value of 12,264 m^3/yr will be used for the inhalation rate parameter.
	Mass loading for inhalation (g/m^3)	1.000E-04	1.000E-04	1.000E-04	MLINH	A value of 1.0E-04 was obtained from Table 6.23 of R2, outdoor air dust loading factor. This value is applicable when the inhalation pathway is turned on.
	Exposure duration (year)	3.000E+01	2.500E+01	2.500E+01	ED	USEPA standard default exposure factors for residential scenarios.
	Shielding factor, inhalation	4.000E-01	5.000E-01	5.000E-01	SHF3	A value of 0.5 was determined by using the air dust loading factor for indoors (5.0E-5) and outdoors (1.0E-4) obtained from Table 6.23 of R2.
	Shielding factor, external gamma	7.000E-01	5.512E-01	5.512E-01	SHF1	A value of 0.5512 was selected from Table 2 of R4. R2 states that this value is 0.33. The value of .5512 is more conservative and therefore used. R5 shows in Table 6.16 that factors are less than .5512 for most gamma energies and shielding material types therefore using a value of .5512 is again considered conservative.
	Fraction of time spent indoors	5.000E-01	5.500E-01	5.500E-01	FIND	According to R2, Table 6.23, the total time spent onsite is 275 effective days, 200 days/yr spent inside, 70.83 days/yr spent outside and 4.17 days/yr spent outside gardening. Therefore, the fraction of time spent indoors would be 200/365 = 0.55.
	Fraction of time spent outdoors (on site)	2.500E-01	2.100E-01	2.100E-01	FOTD	According to R2, Table 6.23, the total time spent onsite is 275 effective days, 200 days/yr spent inside, 70.83 days/yr spent outside and 4.17 days/yr spent outside gardening. Therefore, the fraction of time spent outdoors would be (70.83 + 4.17)/365 = 0.21.
	Shape factor flag, external gamma	1.000E+00	1.000E+00	1.000E+00	FS	Setting this parameter to 1 shows that the contaminated zone is circular and therefore the receptor is placed in the center. R1 Section 4.6.3.7.

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Ingestion, Dietary	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	4.150E+01	4.150E+01	DIET(1)	A value of 166 kg/yr was obtained from R2, Table 6.15, (Other vegetables, 51 + Fruit, 46 + Grain, 69 = 166 kg/y). This applies to a farmer. For the Residential Gardener, it is assumed that their intake is 25% of that of a Farmer. 25% of 166 = 41.5
	Leafy vegetable consumption (kg/yr)	1.400E+01	2.750E+00	2.750E+00	DIET(2)	A value of 11 kg/yr was obtained from R2, Table 6.15 for Leafy Vegetables. This applies to a farmer. For the Residential Gardener, it is assumed that their intake is 25% of that of a Farmer. 25% of 11 = 2.75
	Milk consumption (L/yr)	9.200E+01	not used	not used	DIET(3)	NA
	Meat and poultry consumption (kg/yr)	6.300E+01	not used	not used	DIET(4)	NA
	Fish consumption (kg/yr)	5.400E+00	not used	not used	DIET(5)	NA
	Other seafood consumption (kg/yr)	9.000E-01	not used	not used	DIET(6)	NA
	Soil ingestion rate (g/yr)	3.650E+01	1.825E+01	1.825E+01	SOIL	R2 Page 6.15, uses a value of 50 mg/d (18.25 g/yr) as the value for the residential scenario. Also found in R2 Table 6.23. R3 Section 38 references 0.1 g/d (36.5 g/yr) for the ingestion rate for residential scenario. This 36.5 g/yr value was eliminated because R2 is a more recent and known reference. Therefore, the value of 18.25 g/yr was used.
	Drinking water intake (L/yr)	5.100E+02	not used	not used	DWI	NA
	Contamination fraction of drinking water	1.000E+00	not used	not used	FDW	NA
	Contamination fraction of household water	1.000E+00	not used	not used	FHHW	NA
	Contamination fraction of livestock water	1.000E+00	not used	not used	FLW	NA
	Contamination fraction of irrigation water	1.000E+00	1.000E+00	1.000E+00	FIRW	Default, 100%, This is the most conservative value.

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Contamination fraction of aquatic food	5.000E-01	not used	not used	FR9	NA
	Contamination fraction of plant food	-1.000E+00	-1.000E+00	-1.000E+00	FPLANT	Calculated by model.
	Contamination fraction of meat	-1.000E+00	not used	not used	FMEAT	NA
	Contamination fraction of milk	-1.000E+00	not used	not used	FMILK	NA
Ingestion, Non-Dietary	Livestock fodder intake for meat (kg/day)	6.800E+01	not used	not used	LFI5	NA
	Livestock fodder intake for milk (kg/day)	5.500E+01	not used	not used	LFI6	NA
	Livestock water intake for meat (L/day)	5.000E+01	not used	not used	LWI5	NA
	Livestock water intake for milk (L/day)	1.600E+02	not used	not used	LWI6	NA
	Livestock soil intake (kg/day)	5.000E-01	not used	not used	LSI	NA

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Mass loading for foliar deposition (g/m^3)	1.000E-04	1.000E-04	1.000E-04	MLFD	A value of 1.0E-04 was obtained from Table 6.23 of R2, outdoor air dust loading factor. This value is also the RESRAD program default.
	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	1.500E-01	DM	A value of 0.15 was obtained from Table 6.23 of R2, thickness of surface-soil layer. This value is also the RESRAD program default.
	Depth of roots (m)	9.000E-01	9.000E-01	9.000E-01	DROOT	R3, Section 37 states that most of the plant roots from which nutrients are obtained usually extend to less than 1m below the surface. Therefore the RESRAD default value of 0.9 m was used.
	Drinking water fraction from ground water	1.000E+00	not used	not used	FGWDW	NA
	Household water fraction from ground water	1.000E+00	not used	not used	FGWHH	NA
	Livestock water fraction from ground water	1.000E+00	not used	not used	FGWLW	NA
	Irrigation fraction from ground water	1.000E+00	1.000E+00	1.000E+00	FGWIR	Irrigation water (onsite) is assumed to originate as groundwater, therefore, this parameter is set to 1.0 in the residential scenarios. This value is the maximum allowed for this parameter. Therefore, it is the most conservative assumption.
Ingestion, Non-Dietary - Plant Factors	Wet weight crop yield for Non-Leafy (kg/m^2)	7.000E-01	7.000E-01	7.000E-01	YV(1)	The default value was used.
	Wet weight crop yield for Leafy (kg/m^2)	1.500E+00	1.500E+00	1.500E+00	YV(2)	The default value was used.
	Wet weight crop yield for Fodder (kg/m^2)	1.100E+00	not used	not used	YV(3)	NA
	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	1.700E-01	TE(1)	The default value was used.
	Growing Season for Leafy (years)	2.500E-01	2.500E-01	2.500E-01	TE(2)	The default value was used.
	Growing Season for Fodder (years)	8.000E-02	not used	not used	TE(3)	NA
	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	1.000E-01	TIV(1)	The default value was used.

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	2.6 Acre With Cover	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Translocation Factor for Leafy	1.000E+00	1.000E+00	1.000E+00	TIV(2)	The default value was used. This is the maximum value allowed.
	Translocation Factor for Fodder	1.000E+00	not used	not used	TIV(3)	NA
	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	2.500E-01	RDRY(1)	The default value was used.
	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	2.500E-01	RDRY(2)	The default value was used.
	Dry Foliar Interception Fraction for Fodder	2.500E-01	not used	not used	RDRY(3)	NA
	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	2.500E-01	RWET(1)	The default value was used.
	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	2.500E-01	RWET(2)	The default value was used.
	Wet Foliar Interception Fraction for Fodder	2.500E-01	not used	not used	RWET(3)	NA
	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	2.000E+01	WLAM	The default value was used.
Storage Times	Storage times of contaminated foodstuffs (days):					These parameters are affected by the consumption rates listed above. For example, if a consumption rate is set to zero the corresponding storage time is irrelevant.
	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	1.400E+01	STOR_T(1)	Default value and R2, Section 6.5.3, Table 6.11 & Table 6.23 holding time value for other vegetables or fruit or grain.
	Leafy vegetables	1.000E+00	1.000E+00	1.000E+00	STOR_T(2)	Default value and R2, Section 6.5.3, Table 6.11 & Table 6.23 holding time value for leafy vegetables.

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	Milk	1.000E+00	1.000E+00	1.000E+00	STOR_T(3)	NA
	Meat and poultry	2.000E+01	2.000E+01	2.000E+01	STOR_T(4)	NA
	Fish	7.000E+00	7.000E+00	7.000E+00	STOR_T(5)	NA
	Crustacea and mollusks	7.000E+00	7.000E+00	7.000E+00	STOR_T(6)	NA
	Well water	1.000E+00	1.000E+00	1.000E+00	STOR_T(7)	No reference material available for this parameter therefore, the RESRAD default value was used.
	Surface water	1.000E+00	1.000E+00	1.000E+00	STOR_T(8)	No reference material available for this parameter therefore, the RESRAD default value was used.
	Livestock fodder	4.500E+01	4.500E+01	4.500E+01	STOR_T(9)	NA
Radon	Thickness of building foundation (m)	1.500E-01	not used	not used	FLOOR	NA
	Bulk density of building foundation (g/cm^3)	2.400E+00	not used	not used	DENSFL	NA
	Total porosity of the cover material	4.000E-01	not used	not used	TPCV	NA
	Total porosity of the building foundation	1.000E-01	not used	not used	TPFL	NA
	Volumetric water content of the cover material	5.000E-02	not used	not used	PH2OCV	NA
	Volumetric water content of the foundation	3.000E-02	not used	not used	PH2OFL	NA
	Diffusion coefficient for radon gas (m/sec):		not used	not used		NA
	in cover material	2.000E-06	not used	not used	DIFCV	NA
	in foundation material	3.000E-07	not used	not used	DIFFL	NA

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	in contaminated zone soil	2.000E-06	not used	not used	DIFCZ	NA
	Radon vertical dimension of mixing (m)	2.000E+00	not used	not used	HMIX	NA
	Average building air exchange rate (1/hr)	5.000E-01	not used	not used	REXG	NA
	Height of the building (room) (m)	2.500E+00	not used	not used	HRM	NA
	Building interior area factor	0.000E+00	not used	not used	FAI	NA
	Building depth below ground surface (m)	-1.000E+00	not used	not used	DMFL	NA
	Emanating power of Rn-222 gas	2.500E-01	not used	not used	EMANA(1)	NA
	Emanating power of Rn-220 gas	1.500E-01	not used	not used	EMANA(2)	NA

R1 = User's Manual for RESRAD Version 6.0, July 2001
R2 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume I, June 1994
R3 = Data Collection Handbook to Support Modeling Impacts of Radioactive Material In Soil, Argonne National Laboratory, April 1993
R4 = Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning, Handout, Nuclear Regulatory Commission Workshop, March 18 and 19, 1999.
R5 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume 3, October 1999

NA = Not applicable to the current model because the pathway utilizing the parameter was turned off. The RESRAD summary printout lists each parameter in this table and whether or not it was used in the site specific model.

RESRAD PARAMETER TABLE

3.5–ACRE AREA

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Scenario	Res Gardener	Res. Gardener	Res. Gardener
Applicable Pathways			
External Gamma	X		
Inhalation	X		
Plant Ingestion	X	X	X
Meat Ingestion			
Milk Ingestion			
Aquatic Foods			
Drinking Water			
Soil Ingestion	X		
Radon			
Find Peak Pathway Doses	X	X	X

RESRAD Menu	Parameter	Definition and/or General Information	Default	3.5 Acre with 2' & 4' Cover Sim1	3.5 Acre with 2' Cover Sim2	3.5 Acre with 4' Cover Sim2	Parameter Name	Parameter Justification (R# = See footnote for reference number)
Contaminated Zone	Area of contaminated zone (m^2)	Area in which contains all the soils samples with radionuclide concentrations that are clearly (2 standard deviations) above background. This area is assumed to be circular for modeling purposes.	1 000E+04	6 670E+02	1.416E+04	1.416E+04	AREA	For Simulation 1, the area of the source is the volume of the basement material brought to the surface and spread at a thickness of 0 9m (NUREG 1757 Vol2 App. J .4. This area is 600 m^3 / 0 9 m = 667 m^2. For Simulation 2, the acutal area is used. 3 5 Acres = 14,164 square meters
	Thickness of contaminated zone (meters)	Thickness of the area considered to be the contaminated zone.	2.000E+00	9.000E-01	1.500E-01	1.500E-01	THICK0	For Simulation 1, the thickness of contaminated zone is 0.9m. For Simulation 2, the thickness of contaminated zone is 3 m - thickness of cover.
	Length parallel to aquifer flow (m)	This length is the distance between two parallel lines that are perpendicular to the direction of aquifer flow, one at the upgradient edge of the contaminated zone, the other at the downgradient edge.	1.000E+02	2.580E+01	1.190E+02	1.190E+02	LCZPAQ	The squareroot of the contaminated zone area was used.
Soil Concentrations	Basic radiation dose limit (mrem/yr)	NRC guideline of 25 mrem/yr	2.500E+01	2.500E+01	2.500E+01	2.500E+01	BRDL	NRC guideline of 25 mrem/yr
	Time since placement of material (yr)	This is the elapsed time, in years, between the placement of radioactive materials on-site and the performance of radiological survey. It is possible that on-site radioactive materials originated from different sources and have different placement times. Under this situation, an average value or a best representative value should be used. Non-zero values of this parameter should be input only when the water/soil distribution coefficients are not available and above background level groundwater radionuclide concentrations were measured in radiological survey. Under such conditions, the input groundwater concentrations together with the elapsed time since material placement will be used to derive water/soil concentration ratios and distribution coefficients. A non-zero value for this parameter is necessary to activate the groundwater concentration input box.	0 000E+00				TI	R3 explains that when radiological surveys are used to derive soil guideline information such as soil/water distribution coefficients, soil radionuclide concentrations and so forth, the elapsed time of waste placement is considered zero
Calculation Times	Times for calculations (yr)	NA	1 000E+00	1 000E+00	1 000E+00	1 000E+00	T(2)	NA
	Times for calculations (yr)	NA	3 000E+00	3 000E+00	3 000E+00	3 000E+00	T(3)	NA
	Times for calculations (yr)	NA	1 000E+01	1 000E+01	1 000E+01	1.000E+01	T(4)	NA
	Times for calculations (yr)	NA	3 000E+01	3 000E+01	3 000E+01	3 000E+01	T(5)	NA
	Times for calculations (yr)	NA	1 000E+02	1.000E+02	1 000E+02	1.000E+02	T(6)	NA
	Times for calculations (yr)	NA	3 000E+02	3 000E+02	3.000E+02	3 000E+02	T(7)	NA
	Times for calculations (yr)	NA	1 000E+03	1 000E+03	1.000E+03	1.000E+03	T(8)	NA
Soil Concentrations	Initial principal radionuclides (pCi/g): Ra-226	A principal radionuclide is one with a half-life longer than one-half year.	0.000E+00	1.250E-01	2.500E+00	2.500E+00	S1(4)	For Simulation 1, the source concentration of the residual material is altered to account for mixing with clean cover. Initial source concentration * [Thickness of contaminated zone (m)/ thickness of basement (3 m)] = concentration of material brought to the surface. For Simulation 2, the original source concentration is used
	Initial principal radionuclides (pCi/g): Th-228		0 000E+00	1.250E-01	2 500E+00	2 500E+00	S1(7)	For Simulation 1, the source concentration of the residual material is altered to account for mixing with clean cover. Initial source concentration * [Thickness of contaminated zone (m)/ thickness of basement (3 m)] = concentration of material brought to the surface. For Simulation 2, the original source concentration is used

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RESRAD Menu	Parameter	Definition and/or General Information	Default	3.5 Acre with 2' & 4' Cover Sim1	3.5 Acre with 2' Cover Sim2	3.5 Acre with 4' Cover Sim2	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Initial principal radionuclides (pCi/g): Th-232		0 000E+00	1.250E-01	2.500E+00	2.500E+00	S1(8)	For Simulation 1, the source concentration of the residual material is altered to account for mixing with clean cover. Initial source concentration * [Thickness of contaminated zone (m)/ thickness of basement (3 m)] = concentration of material brought to the surface. For Simulation 2, the original source concentration is used.
	Initial principal radionuclides (pCi/g): U-234		0 000E+00	1.250E-01	2 500E+00	2 500E+00	S1(10)	For Simulation 1, the source concentration of the residual material is altered to account for mixing with clean cover. Initial source concentration * [Thickness of contaminated zone (m)/ thickness of basement (3 m)] = concentration of material brought to the surface. For Simulation 2, the original source concentration is used.
	Initial principal radionuclides (pCi/g): U-238		0 000E+00	1.250E-01	2.500E+00	2.500E+00	S1(11)	For Simulation 1, the source concentration of the residual material is altered to account for mixing with clean cover. Initial source concentration * [Thickness of contaminated zone (m)/ thickness of basement (3 m)] = concentration of material brought to the surface. For Simulation 2, the original source concentration is used.
Cover/Hydrology	Cover depth (m)	The cover depth is the distance from the ground surface to the location of the uppermost soil sample with radionuclide concentrations that are clearly above background.	0 000E+00	0 000E+00	6.100E-01	1.220E+00	COVER0	For Simulation 1, no cover is used. For Simulation 2, a 2 foot and 4 foot cover was used.
	Density of cover material (g/cm^3)	The density is the ratio of the mass of a material to its volume.	1.500E+00	1.830E+00	not used	not used	DENSCV	Average soil density taken from site characterization activities.
	Cover depth erosion rate (m/yr)	The cover depth erosion rate is the rate at which soil is removed by erosion. Appendix A of R1 has values 6 0E-04 for a 2% slope that can be used in a farming scenario and 6.0E-05 for a 2% slope that can be used for a non-farming scenario. This value can also be calculated using the Universal Soil Loss Equation.	1.000E-03	1.000E-04	1.000E-04	1.000E-04	VCV	R3 Section 14, suggests a 1E-05 to 6E-05 m/yr rate for a permanent pasture area times a factor of 3 for a 5% slope. Average of 1E-05 to 6E-05 = 3 5E-05. 3.5E-05 * 3 = .0001
	Density of contaminated zone (g/cm^3)	The density is the ratio of the mass of a material to its volume.	1.500E+00	1.830E+00	1.830E+00	1.830E+00	DENSCZ	Average soil density taken from site characterization activities.
	Contaminated zone erosion rate (m/yr)	The contaminated erosion rate is the rate at which soil is removed by erosion. This parameter is only in effect when the cover depth equals zero. Appendix A of R1 has a value of 6 0E 04 for a 2% slope that can be used in a farming scenario and 6 0E-05 for a 2% slope that can be used for a non-farming scenario. This value can also be calculated using the Universal Soil Loss Equation.	1 000E-03	1.000E-04	1.000E-04	1.000E-04	VCZ	R3 Section 14, suggests a 1E-05 to 6E-05 m/yr rate for a permanent pasture area times a factor of 3 for a 5% slope. Average of 1E-05 to 6E-05 = 3.5E-05. 3 5E-05 * 3 = .0001.
	Contaminated zone total porosity	Total porosity of a porous medium is the ratio of the pore volume to the total volume of a representative sample. Porosity values are listed in Table E.8 of the R1 and Table 3 1 & 3 2 of R3	4 000E-01	4.000E-01	4.000E-01	4.000E-01	TPCZ	The default value was used.
	Contaminated zone field capacity	Effective porosity of a porous medium is the ratio of the part of the pore volume where water can circulate to the total volume of a representative sample. Effective porosity should not be greater than total porosity. Porosity values are listed in Table E.7 of the R1 and Table 3.1 & 3 2 of R3.	2 000E-01	2 000E-01	2.000E-01	2.000E-01	FCCZ	The default value was used.
	Contaminated zone hydraulic conductivity (m/yr)	This value reflects the rate at which groundwater will move through soil. Table E.2 of R1 lists values.	1.000E+01	1.000E+01	1.000E+01	1.000E+01	HCCZ	The default value was used.
	Contaminated zone b parameter	The b parameter is a hydrological parameter used to evaluate the saturation ratio. Values are listed in Table E.2 of R1.	5.300E+00	5.300E+00	5.300E+00	5 300E+00	BCZ	The default value was used.
	Average annual wind speed (m/sec)	The average annual wind speed is the overall average of the wind speed, measured near the surface in a one year period.	2.000E+00	3.130E+00	3.130E+00	3.130E+00	WIND	National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC) wind speed for central PA. 7 mph = 3 13 m/s. This value is assumed to be representative since it was based on 29 years of annual data ontained by NOAA for Central PA .
	Humidity in air (g/cm^3)	This parameter is only relevant to the Tritium model	8.000E+00	not used	not used	not used	HUMID	NA - This parameter is only used when Tritium (H-3) is a principal radionuclide.
	Evapotranspiration coefficient	The evapotranspiration coefficient represents the total volume of water that changes phase, that is, from the liquid or solid state to the gaseous state, near the ground surface and is transferred to the atmosphere during a fixed period of time. R3 Figure 12 presents potential values for the United States.	5 000E-01	5 000E-01	5.000E-01	5.000E-01	EVAPTR	The default value was used.

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RESRAD Menu	Parameter	Definition and/or General Information	Default	3.5 Acre with 2' & 4' Cover Sim1	3.5 Acre with 2' Cover Sim2	3.5 Acre with 4' Cover Sim2	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Precipitation (m/yr)	The precipitation rate is the average volume of water in the form of rain, snow, hail, or sleet that falls per unit of area and per unit of time at the site according to Section 9 of R3	1.000E+00	1.016E+00	1.016E+00	1.016E+00	PRECIP	National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC) precipitation rates for PA. 40 in/yr = 1.016 m/yr. This value is assumed to be representative since it was based on 29 years of annual data ontained by NOAA for Central PA .
	Irrigation (m/yr)	The irrigation rate is the amount of water that is added to the soil at the site as a artificial water supply in order to permit agricultural use of the land. (Section 11, R3 & Page E-6, R1). From R1, the default value for a humid region is 0 2 m/yr where the default for an arid region is 1 m/yr. R2, Table 6 23 lists 76 cm/yr (2.08 L/m^2 * d) for the irrigation water application rate. This value is sufficient to produce most crops. This parameter does not include water used for livestock.	2.000E-01	0.000E+00	2.000E-01	2.000E-01	RI	For Simulation 1, this parameter was set to 0 in accordance with NUREG 1757 Volume 2, Appendix J For simulation 2, the default value was used.
	Irrigation mode	No info available	overhead	overhead	overhead	overhead	IDITCH	Default
	Runoff coefficient	Runoff coefficient is the fraction of the average annual precipitation that does not infiltrate into the soil and is not transferred back into the atmosphere through evapotranspiration. Values are found in Table E.1 of R1 and Table 10.1 of R3.	2 000E-01	2 000E-01	2.000E-01	2 000E-01	RUNOFF	The default value was used.
	Watershed area for nearby stream or pond (m^2)	The watershed is a region contoured by an imaginary line connecting ridges or summits of high land and drained by or draining into a river, river system, or a body of water.	1 000E+06	1.000E+06	1.000E+06	1 000E+06	WAREA	The default value of 1,000,000 m^2 was used.
	Accuracy for water/soil computations	No information available	1 000E-03	1.000E-03	1.000E-03	1 000E-03	EPS	NA
Saturated Zone	Density of saturated zone (g/cm^3)	The density is the ratio of the mass of a material to its volume. The saturated zone is the layer of the uncontaminated zone that lies below the contaminated zone and the unsaturated zone but within the water table. Typical values of Dry Density are found in R3, R4 and R10	1.500E+00	1.630E+00	1.630E+00	1.630E+00	DENSAQ	Average soil density taken from site characterization activities.
	Saturated zone total porosity	Total porosity of a porous medium is the ratio of the pore volume to the total volume of a representative sample. Porosity values are listed in Table E 8 of R1 and Table 3.1 & 3.2 of R3.	4 000E-01	4 000E-01	4.000E-01	4 000E-01	TPSZ	The default value was used.
	Saturated zone effective porosity	Effective porosity of a porous medium is the ratio of the part of the pore volume where water can circulate to the total volume of a representative sample. Effective porosity should not be greater than total porosity. Porosity values are listed in Table E 8 of the R1 and Table 3 1 & 3 2 of R3	2.000E-01	2 000E-01	2.000E-01	2 000E-01	EPSZ	The default value was used.
	Saturated zone field capacity	Field capacity is the volumetric moisture content of soil at which (free) gravity drainage ceases. This is the amount of moisture that will be retained in a column of soil against the force of gravity. The field capacity is used as the lower bound of the moisture content in the soil layer.	2 000E-01	2.000E-01	2.000E-01	2.000E-01	FCSZ	The default value was used
	Saturated zone hydraulic conductivity (m/yr)	Hydraulic conductivity is the measure of the soil's ability to transmit water when submitted to a hydraulic gradient. Values are shown in Table E.2 of R1 and Tables 5.1 & 5 2 of R3.	1.000E+02	1.000E+02	1 000E+02	1.000E+02	HCSZ	The default value was used.
	Saturated zone hydraulic gradient	The hydraulic gradient is the change in hydraulic head per unit of distance of the groundwater flow in a given direction.	2 000E-02	2.000E-02	2 000E-02	2.000E-02	HGWT	The default value was used.
	Saturated zone b parameter	The b parameter is a hydrological parameter used to evaluate the saturation ratio. Values are listed in Table E 2 of R1.	5.300E+00	5.300E+00	5.300E+00	5 300E+00	BSZ	The default value was used.
	Water table drop rate (m/yr)	The water table drop rate is the rate at which the depth of the water table is lowered	1 000E-03	1.000E-03	1.000E-03	1.000E-03	VWT	The default value was used.
	Well pump intake depth (m below water table)	According to R3, the well-pump intake depth is the screened depth of a well within the aquifer (the saturated zone).	1.000E+01	1.000E+01	1.000E+01	1.000E+01	DWIBWT	The default value was used.
	Model: Nondispersion (ND) or Mass-Balance (MB)	The choice of ND (non-dispersion) or MB (mass balance) selects which of two models used for water/soil concentration ratio calculations. Selecting 0 uses the ND model where selecting 1 uses the MB model. The MB model is not recommended for contaminated zones greater than 1000 m^2.	ND	ND	ND	ND	MODEL	Non-dispersion option was selected since area > 1,000 m2

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	Well pumping rate (m^3/yr)	The well pumping rate is the total volume of water obtained annually from the well for use by humans and livestock. R5 Table 6 87 states that 118,000 L is the volume of water used for domestic purposes	2.500E+02	2 500E+02	2.500E+02	2 500E+02	UW	The default value was used.
Unsaturated	Number of unsaturated zone strata	Number of unsaturated zones used in the model.	1	0.000E+00	0.000E+00	0.000E+00	NS	There are no unsaturated zones.
	Unsat. zone 1, thickness (m)	The unsaturated zone #1 is the 1st layer of the uncontaminated zone that lies below the contaminated zone and above the saturated zone	4.000E+00	not used	not used	not used	H(1)	NA
	Unsat. zone 1, soil density (g/cm^3)	The density is the ratio of the mass of a material to its volume.	1 500E+00	not used	not used	not used	DENSUZ(1)	NA
	Unsat. zone 1, total porosity	Total porosity of a porous medium is the ratio of the pore volume to the total volume of a representative sample. Porosity values are listed in Table E.8 of R1 and Table 3 1 & 3.2 of R3	4.000E-01	not used	not used	not used	TPUZ(1)	NA
	Unsat. zone 1, effective porosity	Effective porosity of a porous medium is the ratio of the part of the pore volume where water can circulate to the total volume of a representative sample. Effective porosity should not be greater than total porosity. Porosity values are listed in Table E.8 of the R1 and Table 3 1 & 3 2 of R3	2 000E-01	not used	not used	not used	EPUZ(1)	NA
	Unsat. zone 1, field capacity	Field capacity is the volumetric moisture content of soil at which (free) gravity drainage ceases. This is the amount of moisture that will be retained in a column of soil against the force of gravity. The field capacity is used as the lower bound of the moisture content in the soil layer.	2.000E-01	not used	not used	not used	FCUZ(1)	NA
	Unsat. zone 1, soil-specific b parameter	The b parameter is a hydrological parameter used to evaluate the saturation ratio. Values are listed in Table E.2 of R1. NOTE: Input for this parameter will only be required if the water table drop rate is greater than zero	5.300E+00	not used	not used	not used	BUZ(1)	NA
	Unsat. zone 1, hydraulic conductivity (m/yr)	Hydraulic conductivity is the measure of the soil's ability to transmit water when submitted to a hydraulic gradient.	1.000E+01	not used	not used	not used	HCUZ(1)	NA
Soil Concentrations - Transport	Distribution coefficients for Ra-226							
	Contaminated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	7.000E+01	3.548E+03	3.548E+03	3 548E+03	DCNUCC( )	Pacific Northwest National Laboratory Draft report reference.
	Unsaturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2)	7.000E+01	not used	not used	not used	DCNUCC( )	NA
	Saturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2)	7.000E+01	3.548E+03	3.548E+03	3 548E+03	DCNUCU( )	Pacific Northwest National Laboratory Draft report reference.
	Leach rate (/yr)		0 000E+00	0 000E+00	0 000E+00		ALEACH( )	Calculated by model
	Solubility constant		0 000E+00	0 000E+00	0 000E+00		SOLUBK( )	Supplied by model
	Distribution coefficients for Th-228							
	Contaminated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	6 000E+04	6.000E+04	6 000E+04	6 000E+04	DCNUCC( )	The default value was used
	Unsaturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2)	6.000E+04	6.000E+04	6 000E+04	6 000E+04	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	6 000E+04	6 000E+04	6 000E+04	6.000E+04	DCNUCU( )	The default value was used.
	Leach rate (/yr)		0 000E+00	0 000E+00	0 000E+00	0 000E+00	ALEACH( )	Calculated by model
	Solubility constant		0 000E+00	0 000E+00	0 000E+00	0 000E+00	SOLUBK( )	Supplied by model
	Distribution coefficients for Th-232							

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	Contaminated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	6 000E+04	6 000E+04	6 000E+04	6 000E+04	DCNUCC( )	The default value was used.
	Unsaturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	6.000E+04	6 000E+04	6 000E+04	6.000E+04	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2)	6 000E+04	6.000E+04	6 000E+04	6 000E+04	DCNUCU( )	The default value was used.
	Leach rate (/yr)		0 000E+00	0 000E+00	0 000E+00	0 000E+00	ALEACH( )	Calculated by model
	Solubility constant		0 000E+00	0 000E+00	0 000E+00	0 000E+00	SOLUBK( )	Supplied by model
	Distribution coefficients for U-234							
	Contaminated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	5.000E+01	5 000E+01	5 000E+01	5.000E+01	DCNUCC( )	The default value was used.
	Unsaturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	5 000E+01	5.000E+01	5.000E+01	5 000E+01	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	5 000E+01	5.000E+01	5.000E+01	5 000E+01	DCNUCU( )	The default value was used.
	Leach rate (/yr)		0 000E+00	0 000E+00	0 000E+00	0 000E+00	ALEACH( )	Calculated by model
	Solubility constant		0 000E+00	0 000E+00	0 000E+00	0 000E+00	SOLUBK( )	Supplied by model
	Distribution coefficients for U-238							
	Contaminated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	5 000E+01	5 000E+01	5.000E+01	5.000E+01	DCNUCC( )	The default value was used.
	Unsaturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2).	5 000E+01	5 000E+01	5 000E+01	5 000E+01	DCNUCC( )	The default value was used.
	Saturated zone (cm^3/g)	Distribution coefficients are used to develop the leach-rate constants between the surface soil layer, the unsaturated soil layer and the aquifer (R2)	5.000E+01	5.000E+01	5 000E+01	5 000E+01	DCNUCU( )	The default value was used.
	Leach rate (/yr)		0 000E+00	0 000E+00	0 000E+00	0 000E+00	ALEACH( )	Calculated by model
	Solubility constant		0 000E+00	0 000E+00	0 000E+00	0 000E+00	SOLUBK( )	Supplied by model
Occupancy	Inhalation rate (m^3/yr)	The value of 1.4 m^3/hr was referenced from R5 Page 5-19 as a typical adult male breathing rate. Comparing this value to R3 Section 43, shows that 1.4 m^3/hr (12,264 m^3/yr) it is more conservative than the EPA (1990) referenced value of 11,000 m^3/yr for the reasonable worst-case inhalation rate where activity patterns are not known.	8 400E+03	1.226E+04	not used	not used	INHALR	The value of 1 4 m^3/hr was referenced from R5 Page 5-19 as a typical adult male breathing rate. Comparing this value to R3 Section 43, shows that 1.4 m^3/hr (12,264 m^3/yr) it is more conservative than the EPA (1990) referenced value of 11,000 m^3/yr for the reasonable worst-case inhalation rate where activity patterns are not known. A value of 12,264 m^3/yr will be used for the inhalation rate parameter.
	Mass loading for inhalation (g/m^3)	The mass loading parameter is the concentration of soil particles in the air (Section 35, R3). Table 6.23 lists 1.0 x 10^{-4} as the outdoor air dust loading factor	1.000E-04	1.000E-04	not used	not used	MLINH	A value of 1 0E-04 was obtained from Table 6.23 of R2, outdoor air dust loading factor. This value is applicable when the inhalation pathway is turned on.
	Exposure duration (year)	The exposure duration is the span of time, in years, during which an individual is expected to spend time on the site. The default value in RESRAD is 30 years.	3 000E+01	2.500E+01	2.500E+01	2.500E+01	ED	USEPA standard default exposure factors for residential scenarios.
	Shielding factor, inhalation	The shielding factor describes the effect of the building structure on the level of gamma radiation and/or contaminated dust existing indoors. Specifically, the shielding factor is the fraction of outdoor gamma radiation or contaminated dust that will be available indoors. The default value for this dimensionless parameter is 0.4 for the inhalation pathway and 0 7 for the external gamma pathway.	4 000E-01	5.000E-01	not used	not used	SHF3	A value of 0 5 was determined by using the air dust loading factor for indoors (5 0E-5) and outdoors (1.0E-4) obtained from Table 6 23 of R2.

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	Shielding factor, external gamma	The shielding factor describes the effect of the building structure on the level of gamma radiation and/or contaminated dust existing indoors. Specifically, the shielding factor is the fraction of outdoor gamma radiation or contaminated dust that will be available indoors. The default value for this dimensionless parameter is 0 4 for the inhalation pathway and 0.7 for the external gamma pathway.	7.000E-01	5.512E-01	not used	not used	SHF1	A value of 0.5512 was selected from Table 2 of R4. R2 states that this value is 0 33 The value of .5512 is more conservative and therefore used. R5 shows in Table 6.16 that factors are less than .5512 for most gamma energies and shielding material types therefore using a value of .5512 is again considered conservative.
	Fraction of time spent indoors	The fraction of time spent indoors onsite is the average fraction of time in a year during which an individual stays inside a house or a building on the contaminated site (Section 28, R3).	5 000E-01	6.500E-01	not used	not used	FIND	According to R2, Table 6 23, the total time spent onsite is 275 effective days, 200 days/yr spent inside, 70.83 days/yr spent outside and 4.17 days/yr spent outside gardening Therefore, the fraction of time spent indoors would be 200/365 = 0 55.
	Fraction of time spent outdoors (on site)	The fraction of time spent outdoors onsite is the average fraction of time in a year during which an individual stays outdoors on the site (Section 29, R3).	2.500E-01	2.100E-01	not used	not used	FOTD	According to R2, Table 6 23, the total time spent onsite is 275 effective days, 200 days/yr spent inside, 70 83 days/yr spent outside and 4.17 days/yr spent outside gardening. Therefore, the fraction of time spent outdoors would be (70.83 + 4 17)/365 = 0 21.
	Shape factor flag, external gamma	Setting the shape factor to 1 shows that the contaminated zone is circular or greater than 1200 m2 and therefore the receptor is placed in the center (Page 69, R1 & Section 50, R3).	1 000E+00	1.000E+00	not used	not used	FS	Setting this parameter to 1 shows that the contaminated zone is circular and therefore the receptor is placed in the center. R1 Section 4 6.3 7.
Ingestion, Dietary	Fruits, vegetables and grain consumption (kg/yr)	Consumption rate of items whether produced offsite or onsite. The Contaminated Fraction Parameter takes into account the percentage of the consumed/ingested portion of the item that is obtained from the contaminated site. Consumption rate of fruits, non-leafy (other vegetables), and grain are found in Table 6.15 of R2 (46, 51, & 69 kg/yr respectively). R3 Section 42 gives default values for all but grain (veg, 73 & fruit, 51 kg/yr) but R2 provides info on all items. Both R2 and R3 values are similar.	1 600E+02	4 150E+01	4.150E+01	4 150E+01	DIET(1)	A value of 166 kg/yr was obtained from R2, Table 6.15, (Other vegetables, 51 + Fruit, 46 + Grain, 69 = 166 kg/y). This applies to a farmer. For the Residential Gardener, it is assumed that their intake is 25% of that of a Farmer. 25% of 166 = 41.5
	Leafy vegetable consumption (kg/yr)	Consumption rate of leafy vegetables is found in Table 6 15 of R2. R3 Section 44 gives default values but was eliminated because R2 is more recent.	1.400E+01	2.750E+00	2.750E+00	2.750E+00	DIET(2)	A value of 11 kg/yr was obtained from R2, Table 6.15 for Leafy Vegetables. This applies to a farmer. For the Residential Gardener, it is assumed that their intake is 25% of that of a Farmer. 25% of 11 = 2 75
	Milk consumption (L/yr)	Consumption rate of milk is found in Table 6.15 of R2. R3 Section 47 gives default values but was eliminated because R2 is more recent.	9 200E+01	not used	not used	not used	DIET(3)	NA
	Meat and poultry consumption (kg/yr)	Consumption rates of meat and poultry (beef, 59 kg/yr, & poultry, 9 kg/yr) are found in Table 6 15 of R2. R3 Section 46 gives values that are similar to R2.	6.300E+01	not used	not used	not used	DIET(4)	NA
	Fish consumption (kg/yr)	Consumption rate of fish is found on page 6.28 of R2. R3 Section 41 gives default values but was eliminated because R2 is more recent.	5 400E+00	not used	not used	not used	DIET(5)	NA
	Other seafood consumption (kg/yr)	Consumption rate of other seafood (lobsters, oysters, scallops, shrimp and other non-fish) is assumed to be zero.	9 000E-01	not used	not used	not used	DIET(6)	NA
	Soil ingestion rate (g/yr)	The soil ingestion rate is the accidental ingestion rate of soil material or soil dust. This value is always applicable to the residential scenario. R2 Page 6.15, uses a value of 50 mg/d (18.3 g/yr) as the value for the residential scenario. Also found in R2 Table 6 23. R3 Section 38 references 0 1 g/d (36 5 g/yr) for the ingestion rate for residential scenario. This 36 5 g/yr value was eliminated because R2 is a more recent reference .	3 650E+01	1.825E+01	not used	not used	SOIL	R2 Page 6 15, uses a value of 50 mg/d (18.25 g/yr) as the value for the residential scenario. Also found in R2 Table 6 23. R3 Section 38 references 0 1 g/d (36 5 g/yr) for the ingestion rate for residential scenario. This 36.5 g/yr value was eliminated because R2 is a more recent and known reference. Therefore, the value of 18 25 g/yr was used.
	Drinking water intake (L/yr)	Average amount of water consumed by an adult. R1 states that drinking water intake is 510 L/yr.	5.100E+02	not used	not used	not used	DWI	NA
	Contamination fraction of drinking water	Fraction of substance used that originates from the contaminated site. Only used when applicable pathway is on. For example, for a scenario that does obtain drinking water from onsite, this value is zero. Off-site water is assumed to be uncontaminated (Page 71, R1). If the drinking water pathway is turned off, the value is not used by the program and essentially is zero.	1.000E+00	not used	not used	not used	FDW	NA
	Contamination fraction of household water	Fraction of substance used that originates from the contaminated site.	1.000E+00	not used	not used	not used	FHHW	NA
	Contamination fraction of livestock water	Fraction of substance used that originates from the contaminated site	1 000E+00	not used	not used	not used	FLW	NA

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	Contamination fraction of irrigation water	Fraction of substance used that originates from the contaminated site.	1.000E+00	1.000E+00	not used	not used	FIRW	Default, 100%. This is the most conservative value.
	Contamination fraction of aquatic food	Fraction of substance used that originates from the contaminated site. Only in effect when the aquatic pathway is turned on. It is assumed in R3, Section 41 that if there is a surface water body located onsite, it will provide 50% of the consumed seafood	5.000E-01	not used	not used	not used	FR9	NA
	Contamination fraction of plant food	Fraction of substance used that originates from the contaminated site. Only in effect when plant ingestion pathway is turned on. R3, Section 42 discusses the percentage of homegrown vegetable and fruit products versus total product consumed. As stated in R3, Section 42, the percentage of homegrown vegetables consumed is 25% of the total intake rate and the percentage of homegrown fruits consumed is 20% of the total intake rate. R3 references NRC Reg. Guide 1.109 for grain consumption rates. This reference provided a homegrown consumption percentage of 24% for grain. Averaging these values together, produced a fraction of 23%.	-1.000E+00	-1.000E+00	-1.000E+00	-1.000E+00	FPLANT	Calculated by model.
	Contamination fraction of meat	Fraction of substance used that originates from the contaminated site. Only in effect when meat ingestion pathway is turned on. R3, Section 46 states that 44% of total intake of beef and poultry is obtained from onsite. R3 referenced a 1966 USDA report for the percentage. This percentage most likely has been lowered due to current livestock raising practices. Therefore, the value of 25% seems more representative of today's practices and those for the future.	-1.000E+00	not used	not used	not used	FMEAT	NA
	Contamination fraction of milk	Fraction of substance used that originates from the contaminated site. Only in effect when milk ingestion pathway is turned on. R3, Section 47 states that 40% of total intake of milk is obtained from onsite sources. R3 referenced a 1966 USDA report for the percentage. This percentage most likely has been lowered due to current livestock raising practices. Therefore, the value of 25% seems more representative of today's practices and those for the future.	-1.000E+00	not used	not used	not used	FMILK	NA
Ingestion, Non-Dietary	Livestock fodder intake for meat (kg/day)	Rate at which beef animals intake fodder (forage, hay and grain). R2 Table 6.8, Fodder intake (fresh forage + stored hay + stored grain) for beef animals. 27 + 14 + 3 = 44 kg/d.	6.800E+01	not used	not used	not used	LFI5	NA
	Livestock fodder intake for milk (kg/day)	Rate at which milk cows intake fodder (forage, hay, and grain). R2 Table 6.8, Fodder intake (fresh forage + stored hay + stored grain) for milk cows. 36 + 29 + 2 = 67 kg/d	5.500E+01	not used	not used	not used	LFI6	NA
	Livestock water intake for meat (L/day)	Rate at which beef animals intake water. R2 Table 6.8 states Water intake rate for beef animals of 50 kg/d.	5.000E+01	not used	not used	not used	LWI5	NA
	Livestock water intake for milk (L/day)	Rate at which milk cows intake water.	1.600E+02	not used	not used	not used	LWI6	NA
	Livestock soil intake (kg/day)	Rate at which beef animals and milk cows intake soil.	5.000E-01	not used	not used	not used	LSI	NA
	Mass loading for foliar deposition (g/m^3)	Table 6.23 of R2 lists the outdoor air dust loading factor.	1.000E-04	1.000E-04	1.000E-04	1.000E-04	MLFD	A value of 1.0E-04 was obtained from Table 6.23 of R2, outdoor air dust loading factor. This value is also the RESRAD program default.
	Depth of soil mixing layer (m)	Table 6.23 of R2 lists the value of 0.15 for the thickness of surface soil layer.	1.500E-01	1.500E-01	1.500E-01	1.500E-01	DM	A value of 0.15 was obtained from Table 6.23 of R2, thickness of surface-soil layer. This value is also the RESRAD program default.
	Depth of roots (m)	This parameter is the average root depth of various plants grown in the contaminated zone. The root depth varies for different plants. R3, Section 37 states that most of the plant roots from which nutrients are obtained usually extend to less than 1m below the surface.	9.000E-01	9.000E-01	9.000E-01	9.000E-01	DROOT	R3, Section 37 states that most of the plant roots from which nutrients are obtained usually extend to less than 1m below the surface. Therefore the RESRAD default value of 0.9 m was used.
	Drinking water fraction from ground water	Of the drinking water obtained from onsite sources (groundwater or surface water), this parameter is the percentage of that water that originates from groundwater. Selecting 1 means 100% of drinking water is obtained from site groundwater. Note: This parameter is in effect even when the drinking water pathway is turned off	1.000E+00	not used	not used	not used	FGWDW	NA

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RESRAD Menu	Parameter	Definition and/or General Information	Default	3.5 Acre with 2' & 4' Cover Sim1	3.5 Acre with 2' Cover Sim2	3.5 Acre with 4' Cover Sim2	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Household water fraction from ground water	Of the household water obtained from onsite sources (groundwater or surface water), this parameter is the percentage of that water that originates from groundwater. Selecting 1 means 100% of household water is obtained from site groundwater.	1.000E+00	not used	not used	not used	FGWHH	NA
	Livestock water fraction from ground water	Of the livestock water obtained from onsite sources (groundwater or surface water), this parameter is the percentage of that water that originates from groundwater. Selecting 1 means 100% of livestock water is obtained from site groundwater.	1.000E+00	not used	not used	not used	FGWLW	NA
	Irrigation fraction from ground water	Percentage of irrigation water obtained from onsite groundwater rather than onsite surface water	1.000E+00	1.000E+00	1.000E+00	1.000E+00	FGWIR	Irrigation water (onsite) is assumed to originate as groundwater, therefore, this parameter is set to 1.0 in the residential scenarios. This value is the maximum allowed for this parameter. Therefore, it is the most conservative assumption.
Ingestion, Non-Dietary - Plant Factors	Wet weight crop yield for Non-Leafy (kg/m^2)	Information presented in R2 Section 6.5.7, page 6.23. Parameters in Menu R019B are new to RESRAD in Version 5.82	7.000E-01	7.000E-01	7.000E-01	7.000E-01	YV(1)	The default value was used.
	Wet weight crop yield for Leafy (kg/m^2)	Information presented in R2 Section 6.5.7, page 6.23.	1.500E+00	1.500E+00	1.500E+00	1.500E+00	YV(2)	The default value was used.
	Wet weight crop yield for Fodder (kg/m^2)	Information presented in R2 Section 6.5.7, page 6.23.	1.100E+00	not used	not used	not used	YV(3)	NA
	Growing Season for Non-Leafy (years)	Information presented in R2 Section 6.5.6, page 6.21 and Table 6.12.	1.700E-01	1.700E-01	1.700E-01	1.700E-01	TE(1)	The default value was used.
	Growing Season for Leafy (years)	Information presented in R2 Section 6.5.6, page 6.21 and Table 6.12.	2.500E-01	2.500E-01	2.500E-01	2.500E-01	TE(2)	The default value was used.
	Growing Season for Fodder (years)	Information presented in R2 Section 6.5.6, page 6.21 and Table 6.12.	8.000E-02	not used	not used	not used	TE(3)	NA
	Translocation Factor for Non-Leafy	The translocation fraction is the fraction of activity deposited on plant surfaces that reaches the edible parts of the non-leafy plant.	1.000E-01	1.000E-01	1.000E-01	1.000E-01	TIV(1)	The default value was used
	Translocation Factor for Leafy	The translocation fraction is the fraction of activity deposited on plant surfaces that reaches the edible parts of the leafy plant.	1.000E+00	1.000E+00	1.000E+00	1.000E+00	TIV(2)	The default value was used. This is the maximum value allowed.
	Translocation Factor for Fodder	The translocation fraction is the fraction of activity deposited on plant surfaces that reaches the edible parts of the (grains) plant	1.000E+00	not used	not used	not used	TIV(3)	NA
	Dry Foliar Interception Fraction for Non-Leafy	The interception fraction as defined on Page 6.27, of R2, is the fraction of deposited activity that is retained on plant surfaces. A value of 0.25 is used for all plant types. R2 does not discuss a difference between wet and dry fractions.	2.500E-01	2.500E-01	2.500E-01	2.500E-01	RDRY(1)	The default value was used.
	Dry Foliar Interception Fraction for Leafy	The interception fraction as defined on Page 6.27, of R2, is the fraction of deposited activity that is retained on plant surfaces. A value of 0.25 is used for all plant types. R2 does not discuss a difference between wet and dry fractions.	2.500E-01	2.500E-01	2.500E-01	2.500E-01	RDRY(2)	The default value was used
	Dry Foliar Interception Fraction for Fodder	The interception fraction as defined on Page 6.27, of R2, is the fraction of deposited activity that is retained on plant surfaces. A value of 0.25 is used for all plant types. R2 does not discuss a difference between wet and dry fractions.	2.500E-01	not used	not used	not used	RDRY(3)	NA
	Wet Foliar Interception Fraction for Non-Leafy	The interception fraction as defined on Page 6.27, of R2, is the fraction of deposited activity that is retained on plant surfaces. A value of 0.25 is used for all plant types. R2 does not discuss a difference between wet and dry fractions.	2.500E-01	2.500E-01	2.500E-01	2.500E-01	RWET(1)	The default value was used.
	Wet Foliar Interception Fraction for Leafy	The interception fraction as defined on Page 6.27, of R2, is the fraction of deposited activity that is retained on plant surfaces. A value of 0.25 is used for all plant types. R2 does not discuss a difference between wet and dry fractions.	2.500E-01	2.500E-01	2.500E-01	2.500E-01	RWET(2)	The default value was used.

MolyCorp York
RESRAD Parameter Information
3.5 Acre Site

RESRAD Menu	Parameter	Definition and/or General Information	Default	3.5 Acre with 2" & 4" Cover Sim1	3.5 Acre with 2" Cover Sim2	3.5 Acre with 4" Cover Sim2	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Wet Foliar Interception Fraction for Fodder	The interception fraction as defined on Page 6.27, of R2, is the fraction of deposited activity that is retained on plant surfaces. A value of 0.25 is used for all plant types. R2 does not discuss a difference between wet and dry fractions.	2.500E-01	not used	not used	not used	RWET(3)	NA
	Weathering Removal Constant for Vegetation	No information on this parameters was found.	2.000E+01	2.000E+01	2.000E+01	2.000E+01	WLAM	The default value was used.
Storage Times	Storage times of contaminated foodstuffs (days):	These parameters are affected by the consumption rates listed above. For example, if a consumption rate is set to zero the corresponding storage time is irrelevant.						These parameters are affected by the consumption rates listed above. For example, if a consumption rate is set to zero the corresponding storage time is irrelevant.
	Fruits, non-leafy vegetables, and grain	The storage time for fruits, non-leafy vegetables and grains is the time between harvest and consumption.	1.400E+01	1.400E+01	1.400E+01	1.400E+01	STOR_T(1)	Default value and R2, Section 6.5.3, Table 6.11 & Table 6.23 holding time value for other vegetables or fruit or grain.
	Leafy vegetables	The storage time for leafy vegetables is the time between harvest and consumption.	1.000E+00	1.000E+00	1.000E+00	1.000E+00	STOR_T(2)	Default value and R2, Section 6.5.3, Table 6.11 & Table 6.23 holding time value for leafy vegetables.
	Milk	The storage time for milk is the time between acquisition and consumption	1.000E+00	1.000E+00	1.000E+00	1.000E+00	STOR_T(3)	NA
	Meat and poultry	The storage time for meat and poultry is the time between slaughter and consumption.	2.000E+01	2.000E+01	2.000E+01	2.000E+01	STOR_T(4)	NA
	Fish	The storage time for fish is the time between catch and consumption.	7.000E+00	7.000E+00	7.000E+00	7.000E+00	STOR_T(5)	NA
	Crustacea and mollusks	The storage time for crustacea and mollusks is the time between catch and consumption	7.000E+00	7.000E+00	7.000E+00	7.000E+00	STOR_T(6)	NA
	Well water	The storage time for well water is the time between acquisition and consumption.	1.000E+00	1.000E+00	1.000E+00	1.000E+00	STOR_T(7)	No reference material available for this parameter therefore, the RESRAD default value was used
	Surface water	The storage time for surface water is the time between acquisition and consumption.	1.000E+00	1.000E+00	1.000E+00	1.000E+00	STOR_T(8)	No reference material available for this parameter therefore, the RESRAD default value was used
	Livestock fodder	The storage time for livestock is the time between acquisition and consumption.	4.500E+01	4.500E+01	4.500E+01	4.500E+01	STOR_T(9)	NA
		This set of parameters is used when the radon pathway is turned on.						
Radon	Thickness of building foundation (m)	The thickness of the building foundation is the average thickness of the building shell structure in the subsurface of the soil. (Section 26, R3 & Page 73, R1)	1.500E-01	not used	not used	not used	FLOOR	NA
	Bulk density of building foundation (g/cm^3)	The density of the foundation material.	2.400E+00	not used	not used	not used	DENSFL	NA
	Total porosity of the cover material	Total porosity of a porous medium is the ratio of the pore volume to the total volume of a representative sample. Porosity values are listed in Table E.7 of R1 and Table 3.1 & 3.2 of R3.	4.000E-01	not used	not used	not used	TPCV	NA
	Total porosity of the building foundation	Total porosity of a porous medium is the ratio of the pore volume to the total volume of a representative sample. Porosity values are listed in Table E.7 of R1 and Table 3.1 & 3.2 of R3.	1.000E-01	not used	not used	not used	TPFL	NA
	Volumetric water content of the cover material	The volumetric water content in a porous medium is the ratio of the total volume of water present in the pore space to the total volume of the medium. (Page 74, R1 & Section 6, R3)	5.000E-02	not used	not used	not used	PH2OCV	NA
	Volumetric water content of the foundation	The volumetric water content in a porous medium is the ratio of the total volume of water present in the pore space to the total volume of the medium (Page 74, R1 & Section 6, R3)	3.000E-02	not used	not used	not used	PH2OFL	NA
	Diffusion coefficient for radon gas (m/sec):	The effective radon diffusion coefficient as the ratio of the radon flux across the pore area to the gradient of the radon concentration in the pore spaces (Page 75 R1).		not used	not used	not used		NA
	in cover material	The value is set to -1 so that the program will generate the value on the basis of the porosity and water content of the medium	2.000E-06	not used	not used	not used	DIFCV	NA
	in foundation material	The value is set to -1 so that the program will generate the value on the basis of the porosity and water content of the medium.	3.000E-07	not used	not used	not used	DIFFL	NA
	in contaminated zone soil	The value is set to -1 so that the program will generate the value on the basis of the porosity and water content of the medium	2.000E-06	not used	not used	not used	DIFCZ	NA

MolyCorp York
RESRAD Parameter Information
3.5 Acre Site

RESRAD Menu	Parameter	Definition and/or General Information	Default	3.5 Acre with 2' & 4' Cover Sim1	3.5 Acre with 2' Cover Sim2	3.5 Acre with 4' Cover Sim2	Parameter Name	Parameter Justification (R# = See footnote for reference number)
	Radon vertical dimension of mixing (m)	The radon vertical dimension of mixing parameter is the assumed height to which the radon emission from the ground surface is uniformly mixed in the outdoor air (Page 75, R1& Section 20, R3).	2.000E+00	not used	not used	not used	HMIX	NA
	Average building air exchange rate (1/hr)	The average building air exchange rate is the number of total volumes of air contained in the building that is being exchanged with outside air per unit of time. (Page 75, R1 & Section 22, R3)	5.000E-01	not used	not used	not used	REXG	NA
	Height of the building (room) (m)	The height of the building (room) parameter is the average height of the living area of the building. (Page 75, R1 & Section 23, R3)	2.500E+00	not used	not used	not used	HRM	NA
	Building interior area factor	The building interior area factor is the fraction of the floor area built on the contaminated area (Page 75, R1 & Section 24, R3). Setting the value to 1.0 indicates that the entire floor area was built on the contaminated zone. Setting the value to 0 prompts the model to calculate a time-dependent area factor on the basis of an assumed floor area of 100 m2 and the amount of wall area extending into the contaminated zone.	0.000E+00	not used	not used	not used	FAI	NA
	Building depth below ground surface (m)	The foundation depth below ground surface is the vertical distance in the soil from the very bottom of the basement floor slab to the ground surface. (Page 76, R1 & Section 27, R3)	-1.000E+00	not used	not used	not used	DMFL	NA
	Emanating power of Rn-222 gas	The radon emanation coefficient is the fraction of the total amount of radon produced by radium decay that escapes from the soil particles and gets into the pores of the medium (Section 8, R3 & Page 76, R1).	2.500E-01	not used	not used	not used	EMANA(1)	NA
	Emanating power of Rn-220 gas	The radon emanation coefficient is the fraction of the total amount of radon produced by radium decay that escapes from the soil particles and gets into the pores of the medium. (Section 8, R3 & Page 76, R1)	1.500E-01	not used	not used	not used	EMANA(2)	NA

R1 = User's Manual for RESRAD Version 6.0, July 2001
R2 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume I, June 1994
R3 = Data Collection Handbook to Support Modeling Impacts of Radioactive Material In Soil, Argonne National Laboratory, April 1993
R4 = Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning, Handout, Nuclear Regulatory Commission Workshop, March 18 and 19, 1999.
R5 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume 3, October 1999

ATTACHMENT C

RESRAD OUTPUT

RESRAD SUMMARY REPORT

2.6–ACRE AREA

NO COVER

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	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)
	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
	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)

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

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)
	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

	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.052E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.030E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
RC11	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): Ra-226	3.600E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): U-234	6.800E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	6.800E-01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
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
	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.130E+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)	1.016E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	Romberg failures occurred	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+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
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.475E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.063E-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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.063E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Pb-210				
	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(1)
	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.034E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.475E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for daughter Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(6)
	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(6)
	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Inhalation rate (m**3/yr)	1.226E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	5.512E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.500E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
[illegible]	Ring 1	not used	1.000E+00	---	FRACA(1)
[illegible]	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)	4.150E+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)	1.825E+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	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
[illegible]	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
[illegible]	Contamination fraction of meat	not used	-1	---	FMEAT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	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	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	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)
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
C14	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10522.00 square meters	Ra-226	3.600E-01
Thickness:	3.00 meters	U-234	6.800E-01
Cover Depth:	0.00 meters	U-238	6.800E-01

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	2.479E+00	2.494E+00	2.520E+00	2.594E+00	2.700E+00	2.566E+00	1.821E+00	5.771E-01
M(t):	9.918E-02	9.975E-02	1.008E-01	1.038E-01	1.080E-01	1.027E-01	7.282E-02	2.309E-02

Maximum TDOSE(t): 2.713E+00 mrem/yr at t = 42.15 ± 0.08 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 = 4.215E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	1.798E+00	0.6626	7.237E-04	0.0003	0.000E+00	0.0000	7.903E-01	0.2913	0.000E+00	0.0000	0.000E+00	0.0000	3.106E-02	0.0114
4	1.370E-04	0.0001	6.929E-03	0.0026	0.000E+00	0.0000	9.758E-03	0.0036	0.000E+00	0.0000	0.000E+00	0.0000	2.446E-03	0.0009
U-238	4.583E-02	0.0169	6.190E-03	0.0023	0.000E+00	0.0000	9.271E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	2.324E-03	0.0009
Total	1.844E+00	0.6795	1.384E-02	0.0051	0.000E+00	0.0000	8.093E-01	0.2983	0.000E+00	0.0000	0.000E+00	0.0000	3.583E-02	0.0132

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.215E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.167E-03	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	2.627E+00	0.9682
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.684E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.095E-02	0.0077
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.601E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	6.522E-02	0.0240
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.045E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	2.713E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	1.948E+00	0.7855	2.713E-04	0.0001	0.000E+00	0.0000	4.339E-01	0.1750	0.000E+00	0.0000	0.000E+00	0.0000	7.192E-03	0.0029
U-234	1.359E-04	0.0001	7.553E-03	0.0030	0.000E+00	0.0000	1.064E-02	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	2.666E-03	0.0011
U-238	4.999E-02	0.0202	6.751E-03	0.0027	0.000E+00	0.0000	1.011E-02	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	2.534E-03	0.0010
Total	1.998E+00	0.8057	1.458E-02	0.0059	0.000E+00	0.0000	4.547E-01	0.1834	0.000E+00	0.0000	0.000E+00	0.0000	1.239E-02	0.0050

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.554E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.389E+00	0.9635
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.101E-02	0.0085
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.837E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.941E-02	0.0280
...l	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.324E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.479E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

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.
Ra-226	1.944E+00	0.7795	2.920E-04	0.0001	0.000E+00	0.0000	4.508E-01	0.1808	0.000E+00	0.0000	0.000E+00	0.0000	8.270E-03	0.0033
U-234	1.356E-04	0.0001	7.537E-03	0.0030	0.000E+00	0.0000	1.062E-02	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	2.661E-03	0.0011
U-238	4.989E-02	0.0200	6.738E-03	0.0027	0.000E+00	0.0000	1.009E-02	0.0040	0.000E+00	0.0000	0.000E+00	0.0000	2.529E-03	0.0010
Total	1.994E+00	0.7996	1.457E-02	0.0058	0.000E+00	0.0000	4.715E-01	0.1891	0.000E+00	0.0000	0.000E+00	0.0000	1.346E-02	0.0054

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.594E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.403E+00	0.9638
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.021E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.101E-02	0.0084
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.723E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.931E-02	0.0278
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.034E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.494E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

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.
Ra-226	1.937E+00	0.7685	3.311E-04	0.0001	0.000E+00	0.0000	4.823E-01	0.1914	0.000E+00	0.0000	0.000E+00	0.0000	1.032E-02	0.0041
U-234	1.351E-04	0.0001	7.506E-03	0.0030	0.000E+00	0.0000	1.057E-02	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	2.650E-03	0.0011
U-238	4.969E-02	0.0197	6.710E-03	0.0027	0.000E+00	0.0000	1.005E-02	0.0040	0.000E+00	0.0000	0.000E+00	0.0000	2.519E-03	0.0010
Total	1.986E+00	0.7883	1.455E-02	0.0058	0.000E+00	0.0000	5.029E-01	0.1996	0.000E+00	0.0000	0.000E+00	0.0000	1.549E-02	0.0061

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.347E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.430E+00	0.9642
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.421E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.101E-02	0.0083
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.351E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.910E-02	0.0274
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.119E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.520E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

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.
Ra-226	1.911E+00	0.7366	4.484E-04	0.0002	0.000E+00	0.0000	5.760E-01	0.2220	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-02	0.0063
U-234	1.339E-04	0.0001	7.400E-03	0.0029	0.000E+00	0.0000	1.042E-02	0.0040	0.000E+00	0.0000	0.000E+00	0.0000	2.612E-03	0.0010
U-238	4.897E-02	0.0189	6.614E-03	0.0025	0.000E+00	0.0000	9.906E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	2.483E-03	0.0010
Total	1.960E+00	0.7555	1.446E-02	0.0056	0.000E+00	0.0000	5.963E-01	0.2299	0.000E+00	0.0000	0.000E+00	0.0000	2.155E-02	0.0083

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.001E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.505E+00	0.9655
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.265E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.099E-02	0.0081
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.054E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	6.838E-02	0.0264
[illegible]l	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.833E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	2.594E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	1.840E+00	0.6814	6.571E-04	0.0002	0.000E+00	0.0000	7.401E-01	0.2741	0.000E+00	0.0000	0.000E+00	0.0000	2.748E-02	0.0102
U-234	1.342E-04	0.0000	7.104E-03	0.0026	0.000E+00	0.0000	1.000E-02	0.0037	0.000E+00	0.0000	0.000E+00	0.0000	2.508E-03	0.0009
U-238	4.699E-02	0.0174	6.347E-03	0.0024	0.000E+00	0.0000	9.506E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	2.383E-03	0.0009
Total	1.887E+00	0.6989	1.411E-02	0.0052	0.000E+00	0.0000	7.596E-01	0.2813	0.000E+00	0.0000	0.000E+00	0.0000	3.237E-02	0.0120

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.538E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	2.613E+00	0.9676
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.218E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-02	0.0078
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.158E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	6.639E-02	0.0246
[illegible]1	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.914E-03	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	2.700E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	1.610E+00	0.6274	7.841E-04	0.0003	0.000E+00	0.0000	8.197E-01	0.3194	0.000E+00	0.0000	0.000E+00	0.0000	3.483E-02	0.0136
U-234	1.744E-04	0.0001	6.158E-03	0.0024	0.000E+00	0.0000	8.684E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	2.174E-03	0.0008
U-238	4.068E-02	0.0158	5.495E-03	0.0021	0.000E+00	0.0000	8.229E-03	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	2.063E-03	0.0008
Total	1.651E+00	0.6433	1.244E-02	0.0048	0.000E+00	0.0000	8.366E-01	0.3260	0.000E+00	0.0000	0.000E+00	0.0000	3.907E-02	0.0152

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.004E-02	0.0078	0.000E+00	0.0000	0.000E+00	0.0000	2.485E+00	0.9684
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.759E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	2.095E-02	0.0082
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.575E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	6.004E-02	0.0234
.l	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.737E-02	0.0107	0.000E+00	0.0000	0.000E+00	0.0000	2.566E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ra-226	1.099E+00	0.6038	5.548E-04	0.0003	0.000E+00	0.0000	5.757E-01	0.3162	0.000E+00	0.0000	0.000E+00	0.0000	2.479E-02	0.0136
U-234	5.135E-04	0.0003	4.102E-03	0.0023	0.000E+00	0.0000	5.943E-03	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	1.453E-03	0.0008
U-238	2.692E-02	0.0148	3.639E-03	0.0020	0.000E+00	0.0000	5.451E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-03	0.0008
Total	1.127E+00	0.6189	8.296E-03	0.0046	0.000E+00	0.0000	5.871E-01	0.3225	0.000E+00	0.0000	0.000E+00	0.0000	2.761E-02	0.0152

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.258E-02	0.0289	0.000E+00	0.0000	0.000E+00	0.0000	1.753E+00	0.9628
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.395E-03	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	2.141E-02	0.0118
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.933E-03	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	4.631E-02	0.0254
[illegible]l	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.091E-02	0.0389	0.000E+00	0.0000	0.000E+00	0.0000	1.821E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.890E-01	0.5007	1.459E-04	0.0003	0.000E+00	0.0000	1.514E-01	0.2623	0.000E+00	0.0000	0.000E+00	0.0000	6.518E-03	0.0113
U-234	2.159E-03	0.0037	1.029E-03	0.0018	0.000E+00	0.0000	2.443E-03	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	4.021E-04	0.0007
U-238	6.354E-03	0.0110	8.607E-04	0.0015	0.000E+00	0.0000	1.290E-03	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	3.231E-04	0.0006
Total	2.975E-01	0.5155	2.035E-03	0.0035	0.000E+00	0.0000	1.551E-01	0.2687	0.000E+00	0.0000	0.000E+00	0.0000	7.243E-03	0.0126

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.796E-02	0.1524	0.000E+00	0.0000	0.000E+00	0.0000	5.350E-01	0.9270
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.411E-02	0.0245	0.000E+00	0.0000	0.000E+00	0.0000	2.014E-02	0.0349
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.317E-02	0.0228	0.000E+00	0.0000	0.000E+00	0.0000	2.200E-02	0.0381
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-01	0.1997	0.000E+00	0.0000	0.000E+00	0.0000	5.771E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (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
Ra-226	Ra-226	1.000E+00	6.605E+00	6.593E+00	6.568E+00	6.482E+00	6.242E+00	5.470E+00	3.757E+00	1.030E+00
Ra-226	Pb-210	1.000E+00	3.097E-02	8.329E-02	1.813E-01	4.766E-01	1.016E+00	1.434E+00	1.112E+00	4.558E-01
Ra-226	∑DSR(j)		6.636E+00	6.676E+00	6.749E+00	6.958E+00	7.257E+00	6.904E+00	4.869E+00	1.486E+00
U-234	U-234	1.000E+00	3.090E-02	3.090E-02	3.089E-02	3.087E-02	3.081E-02	3.064E-02	3.041E-02	2.417E-02
U-234	Th-230	1.000E+00	2.200E-07	6.502E-07	1.506E-06	4.475E-06	1.272E-05	3.903E-05	9.618E-05	1.808E-04
U-234	Ra-226	1.000E+00	4.218E-09	2.978E-08	1.577E-07	1.401E-06	1.152E-05	1.142E-04	7.935E-04	3.947E-03
U-234	Pb-210	1.000E+00	1.574E-11	1.638E-10	1.627E-09	3.792E-08	7.733E-07	1.702E-05	1.814E-04	1.322E-03
U-234	∑DSR(j)		3.090E-02	3.090E-02	3.089E-02	3.087E-02	3.083E-02	3.081E-02	3.148E-02	2.962E-02
U-238	U-238	1.000E+00	1.021E-01	1.019E-01	1.016E-01	1.006E-01	9.763E-02	8.828E-02	6.808E-02	3.228E-02
U-238	U-234	1.000E+00	4.380E-08	1.314E-07	3.065E-07	9.189E-07	2.664E-06	8.730E-06	2.592E-05	6.866E-05
U-238	Th-230	1.000E+00	2.117E-13	1.447E-12	7.548E-12	6.651E-11	5.446E-10	5.371E-09	3.680E-08	1.746E-07
U-238	Ra-226	1.000E+00	1.457E-12	4.532E-12	1.005E-11	4.036E-11	4.055E-10	1.086E-08	2.133E-07	3.043E-06
U-238	Pb-210	1.000E+00	5.592E-12	1.725E-11	3.665E-11	1.021E-10	3.067E-10	2.162E-09	4.727E-08	1.114E-06
U-238	∑DSR(j)		1.021E-01	1.019E-01	1.016E-01	1.006E-01	9.763E-02	8.829E-02	6.811E-02	3.235E-02

*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 = 2.500E+01 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
Ra-226	3.767E+00	3.745E+00	3.704E+00	3.593E+00	3.445E+00	3.621E+00	5.134E+00	1.682E+01
U-234	8.090E+02	8.091E+02	8.093E+02	8.097E+02	8.108E+02	8.115E+02	7.942E+02	8.439E+02
U-238	2.449E+02	2.453E+02	2.460E+02	2.486E+02	2.561E+02	2.832E+02	3.671E+02	7.727E+02

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 42.15 ± 0.08 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ra-226	3.600E-01	42.80 ± 0.09	7.297E+00	3.426E+00	7.297E+00	3.426E+00
U-234	6.800E-01	879 ± 2	3.535E-02	7.073E+02	3.082E-02	8.113E+02
U-238	6.800E-01	0.000E+00	1.021E-01	2.449E+02	9.591E-02	2.607E+02

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	2.378E+00	2.373E+00	2.364E+00	2.333E+00	2.247E+00	1.969E+00	1.352E+00	3.709E-01
Ra-226	U-234	1.000E+00	2.868E-09	2.025E-08	1.072E-07	9.528E-07	7.833E-06	7.769E-05	5.396E-04	2.684E-03
Ra-226	U-238	1.000E+00	9.905E-13	3.082E-12	6.833E-12	2.744E-11	2.758E-10	7.387E-09	1.451E-07	2.069E-06
Ra-226	∑DOSE(j)		2.378E+00	2.373E+00	2.364E+00	2.333E+00	2.247E+00	1.969E+00	1.353E+00	3.736E-01
Pb-210	Ra-226	1.000E+00	1.115E-02	2.998E-02	6.527E-02	1.716E-01	3.656E-01	5.161E-01	4.005E-01	1.641E-01
Pb-210	U-234	1.000E+00	1.070E-11	1.114E-10	1.106E-09	2.579E-08	5.259E-07	1.158E-05	1.233E-04	8.988E-04
Pb-210	U-238	1.000E+00	3.802E-12	1.173E-11	2.492E-11	6.945E-11	2.086E-10	1.470E-09	3.214E-08	7.576E-07
Pb-210	∑DOSE(j)		1.115E-02	2.998E-02	6.527E-02	1.716E-01	3.656E-01	5.162E-01	4.006E-01	1.650E-01
U-234	U-234	1.000E+00	2.101E-02	2.101E-02	2.101E-02	2.099E-02	2.095E-02	2.083E-02	2.068E-02	1.644E-02
U-234	U-238	1.000E+00	2.978E-08	8.934E-08	2.084E-07	6.248E-07	1.811E-06	5.937E-06	1.762E-05	4.669E-05
U-234	∑DOSE(j)		2.101E-02	2.101E-02	2.101E-02	2.099E-02	2.095E-02	2.084E-02	2.070E-02	1.648E-02
Th-230	U-234	1.000E+00	1.496E-07	4.422E-07	1.024E-06	3.043E-06	8.651E-06	2.654E-05	6.540E-05	1.230E-04
Th-230	U-238	1.000E+00	1.440E-13	9.839E-13	5.133E-12	4.523E-11	3.704E-10	3.652E-09	2.502E-08	1.187E-07
Th-230	∑DOSE(j)		1.496E-07	4.422E-07	1.024E-06	3.043E-06	8.651E-06	2.655E-05	6.543E-05	1.231E-04
U-238	U-238	1.000E+00	6.941E-02	6.931E-02	6.910E-02	6.838E-02	6.639E-02	6.003E-02	4.630E-02	2.195E-02

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	3.600E-01	3.593E-01	3.579E-01	3.532E-01	3.400E-01	2.975E-01	2.031E-01	5.339E-02
Ra-226	U-234	1.000E+00	0.000E+00	1.324E-09	1.189E-08	1.308E-07	1.147E-06	1.162E-05	8.092E-05	3.948E-04
Ra-226	U-238	1.000E+00	0.000E+00	1.251E-15	3.368E-14	1.234E-12	3.233E-11	1.078E-09	2.165E-08	3.004E-07
Ra-226	∑S(j):		3.600E-01	3.593E-01	3.579E-01	3.532E-01	3.400E-01	2.975E-01	2.032E-01	5.379E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	1.100E-02	3.191E-02	9.475E-02	2.085E-01	2.911E-01	2.089E-01	5.494E-02
Pb-210	U-234	1.000E+00	0.000E+00	1.361E-11	3.611E-10	1.257E-08	2.873E-07	6.471E-06	6.582E-05	3.709E-04
Pb-210	U-238	1.000E+00	0.000E+00	9.663E-18	7.709E-16	9.032E-14	6.340E-12	5.044E-10	1.618E-08	2.757E-07
Pb-210	∑S(j):		0.000E+00	1.100E-02	3.191E-02	9.475E-02	2.085E-01	2.912E-01	2.090E-01	5.531E-02
U-234	U-234	1.000E+00	6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.391E-01	5.531E-01	3.659E-01	8.616E-02
U-234	U-238	1.000E+00	0.000E+00	1.924E-06	5.748E-06	1.888E-05	5.436E-05	1.568E-04	3.113E-04	2.446E-04
U-234	∑S(j):		6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.392E-01	5.532E-01	3.662E-01	8.641E-02
Th-230	U-234	1.000E+00	0.000E+00	6.115E-06	1.831E-05	6.058E-05	1.780E-04	5.527E-04	1.366E-03	2.569E-03
Th-230	U-238	1.000E+00	0.000E+00	8.665E-12	7.777E-11	8.558E-10	7.493E-09	7.567E-08	5.218E-07	2.476E-06
Th-230	∑S(j):		0.000E+00	6.115E-06	1.831E-05	6.058E-05	1.780E-04	5.526E-04	1.367E-03	2.572E-03
U-238	U-238	1.000E+00	6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.392E-01	5.532E-01	3.662E-01	8.641E-02

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

RESCALC.EXE execution time = 13.03 seconds
Total water/soil iteration failures = 2.

RESRAD SUMMARY REPORT

2.6–ACRE AREA

4-INCH COVER

Summary : Molycorp York 2 acre with 4 inch cover
File : York 2-6 acre with 4 in cover.RAD

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	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:			
	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
	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)
	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

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

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)
	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
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

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.052E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.030E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-226	3.600E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): U-234	6.800E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	6.800E-01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
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)
	Cover depth (m)	1.016E-01	0.000E+00	---	COVER0
	Density of cover material (g/cm**3)	1.630E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.130E+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)	1.016E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	Romberg failures occurred	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+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
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.475E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.063E-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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.063E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(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	1.034E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.475E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R017	Inhalation rate (m**3/yr)	1.226E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	5.512E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.500E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
	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)	4.150E+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)
	Soil ingestion rate (g/yr)	1.825E+01	3.650E+01	---	SOIL
	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	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	1.000E+00	1.000E+00	---	FGWIR
	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
	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)
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
	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10522.00 square meters	Ra-226	3.600E-01
Thickness:	3.00 meters	U-234	6.800E-01
Cover Depth:	0.10 meters	U-238	6.800E-01

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	9.071E-01	9.223E-01	9.507E-01	1.036E+00	1.186E+00	1.267E+00	1.050E+00	5.763E-01
M(t):	3.628E-02	3.689E-02	3.803E-02	4.143E-02	4.744E-02	5.069E-02	4.198E-02	2.305E-02

Maximum TDOSE(t): 1.276E+00 mrem/yr at t = 77.9 ± 0.2 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 = 7.791E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	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.
Ra-226	4.645E-01	0.3642	2.960E-04	0.0002	0.000E+00	0.0000	7.449E-01	0.5840	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-02	0.0102
U-234	1.548E-05	0.0000	2.415E-03	0.0019	0.000E+00	0.0000	8.129E-03	0.0064	0.000E+00	0.0000	0.000E+00	0.0000	8.526E-04	0.0007
U-238	9.515E-03	0.0075	2.156E-03	0.0017	0.000E+00	0.0000	7.714E-03	0.0060	0.000E+00	0.0000	0.000E+00	0.0000	8.094E-04	0.0006
Total	4.741E-01	0.3717	4.867E-03	0.0038	0.000E+00	0.0000	7.608E-01	0.5964	0.000E+00	0.0000	0.000E+00	0.0000	1.474E-02	0.0116

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.791E+01 years

Water Dependent Pathways

Radio-Nuclide	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-02	0.0120	0.000E+00	0.0000	0.000E+00	0.0000	1.238E+00	0.9706
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.998E-03	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	1.441E-02	0.0113
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.851E-03	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	2.304E-02	0.0181
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.112E-02	0.0166	0.000E+00	0.0000	0.000E+00	0.0000	1.276E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	4.850E-01	0.5347	8.764E-05	0.0001	0.000E+00	0.0000	3.850E-01	0.4244	0.000E+00	0.0000	0.000E+00	0.0000	2.323E-03	0.0026
U-234	4.084E-06	0.0000	2.439E-03	0.0027	0.000E+00	0.0000	9.435E-03	0.0104	0.000E+00	0.0000	0.000E+00	0.0000	8.613E-04	0.0009
U-238	9.943E-03	0.0110	2.181E-03	0.0024	0.000E+00	0.0000	8.969E-03	0.0099	0.000E+00	0.0000	0.000E+00	0.0000	8.186E-04	0.0009
Total	4.950E-01	0.5457	4.708E-03	0.0052	0.000E+00	0.0000	4.034E-01	0.4447	0.000E+00	0.0000	0.000E+00	0.0000	4.003E-03	0.0044

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.554E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.724E-01	0.9618
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.276E-02	0.0141
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.837E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.193E-02	0.0242
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.324E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	9.071E-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+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	4.848E-01	0.5256	9.450E-05	0.0001	0.000E+00	0.0000	4.000E-01	0.4337	0.000E+00	0.0000	0.000E+00	0.0000	2.677E-03	0.0029
U-234	4.093E-06	0.0000	2.440E-03	0.0026	0.000E+00	0.0000	9.417E-03	0.0102	0.000E+00	0.0000	0.000E+00	0.0000	8.613E-04	0.0009
U-238	9.937E-03	0.0108	2.181E-03	0.0024	0.000E+00	0.0000	8.951E-03	0.0097	0.000E+00	0.0000	0.000E+00	0.0000	8.186E-04	0.0009
Total	4.947E-01	0.5364	4.715E-03	0.0051	0.000E+00	0.0000	4.183E-01	0.4536	0.000E+00	0.0000	0.000E+00	0.0000	4.357E-03	0.0047

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.594E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.876E-01	0.9623
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.021E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.278E-02	0.0139
`8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.723E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.195E-02	0.0238
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.034E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	9.223E-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+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	4.842E-01	0.5093	1.076E-04	0.0001	0.000E+00	0.0000	4.280E-01	0.4502	0.000E+00	0.0000	0.000E+00	0.0000	3.353E-03	0.0035
U-234	4.120E-06	0.0000	2.440E-03	0.0026	0.000E+00	0.0000	9.381E-03	0.0099	0.000E+00	0.0000	0.000E+00	0.0000	8.613E-04	0.0009
U-238	9.926E-03	0.0104	2.181E-03	0.0023	0.000E+00	0.0000	8.917E-03	0.0094	0.000E+00	0.0000	0.000E+00	0.0000	8.186E-04	0.0009
Total	4.942E-01	0.5198	4.728E-03	0.0050	0.000E+00	0.0000	4.463E-01	0.4694	0.000E+00	0.0000	0.000E+00	0.0000	5.033E-03	0.0053

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.347E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	9.159E-01	0.9634
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.422E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-02	0.0135
9	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.351E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.198E-02	0.0231
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.119E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	9.507E-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-	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.
Ra-226	4.824E-01	0.4658	1.478E-04	0.0001	0.000E+00	0.0000	5.116E-01	0.4940	0.000E+00	0.0000	0.000E+00	0.0000	5.426E-03	0.0052
U-234	4.328E-06	0.0000	2.439E-03	0.0024	0.000E+00	0.0000	9.255E-03	0.0089	0.000E+00	0.0000	0.000E+00	0.0000	8.612E-04	0.0008
U-238	9.887E-03	0.0095	2.180E-03	0.0021	0.000E+00	0.0000	8.797E-03	0.0085	0.000E+00	0.0000	0.000E+00	0.0000	8.185E-04	0.0008
Total	4.923E-01	0.4753	4.768E-03	0.0046	0.000E+00	0.0000	5.297E-01	0.5115	0.000E+00	0.0000	0.000E+00	0.0000	7.106E-03	0.0069

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.001E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.001E+00	0.9661
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.265E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-02	0.0125
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.055E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.209E-02	0.0213
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.833E-03	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	1.036E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	4.770E-01	0.4022	2.254E-04	0.0002	0.000E+00	0.0000	6.590E-01	0.5556	0.000E+00	0.0000	0.000E+00	0.0000	9.426E-03	0.0079
U-234	5.889E-06	0.0000	2.437E-03	0.0021	0.000E+00	0.0000	8.906E-03	0.0075	0.000E+00	0.0000	0.000E+00	0.0000	8.601E-04	0.0007
U-238	9.776E-03	0.0082	2.177E-03	0.0018	0.000E+00	0.0000	8.463E-03	0.0071	0.000E+00	0.0000	0.000E+00	0.0000	8.172E-04	0.0007
Total	4.868E-01	0.4105	4.839E-03	0.0041	0.000E+00	0.0000	6.764E-01	0.5703	0.000E+00	0.0000	0.000E+00	0.0000	1.110E-02	0.0094

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.540E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	1.150E+00	0.9698
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.218E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.343E-02	0.0113
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.158E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	2.239E-02	0.0189
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.917E-03	0.0058	0.000E+00	0.0000	0.000E+00	0.0000	1.186E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	4.589E-01	0.3621	3.055E-04	0.0002	0.000E+00	0.0000	7.363E-01	0.5810	0.000E+00	0.0000	0.000E+00	0.0000	1.357E-02	0.0107
U-234	2.269E-05	0.0000	2.400E-03	0.0019	0.000E+00	0.0000	7.799E-03	0.0062	0.000E+00	0.0000	0.000E+00	0.0000	8.471E-04	0.0007
U-238	9.397E-03	0.0074	2.141E-03	0.0017	0.000E+00	0.0000	7.391E-03	0.0058	0.000E+00	0.0000	0.000E+00	0.0000	8.037E-04	0.0006
Total	4.683E-01	0.3695	4.846E-03	0.0038	0.000E+00	0.0000	7.515E-01	0.5930	0.000E+00	0.0000	0.000E+00	0.0000	1.522E-02	0.0120

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.007E-02	0.0158	0.000E+00	0.0000	0.000E+00	0.0000	1.229E+00	0.9699
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.765E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	1.483E-02	0.0117
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.580E-03	0.0028	0.000E+00	0.0000	0.000E+00	0.0000	2.331E-02	0.0184
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.741E-02	0.0216	0.000E+00	0.0000	0.000E+00	0.0000	1.267E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ra-226	4.106E-01	0.3912	2.902E-04	0.0003	0.000E+00	0.0000	5.299E-01	0.5049	0.000E+00	0.0000	0.000E+00	0.0000	1.297E-02	0.0124
U-234	1.700E-04	0.0002	2.145E-03	0.0020	0.000E+00	0.0000	5.470E-03	0.0052	0.000E+00	0.0000	0.000E+00	0.0000	7.601E-04	0.0007
U-238	8.392E-03	0.0080	1.903E-03	0.0018	0.000E+00	0.0000	5.016E-03	0.0048	0.000E+00	0.0000	0.000E+00	0.0000	7.145E-04	0.0007
Total	4.192E-01	0.3994	4.339E-03	0.0041	0.000E+00	0.0000	5.404E-01	0.5149	0.000E+00	0.0000	0.000E+00	0.0000	1.444E-02	0.0138

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.279E-02	0.0503	0.000E+00	0.0000	0.000E+00	0.0000	1.007E+00	0.9591
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.434E-03	0.0090	0.000E+00	0.0000	0.000E+00	0.0000	1.798E-02	0.0171
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.971E-03	0.0085	0.000E+00	0.0000	0.000E+00	0.0000	2.500E-02	0.0238
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.120E-02	0.0678	0.000E+00	0.0000	0.000E+00	0.0000	1.050E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.873E-01	0.4985	1.444E-04	0.0003	0.000E+00	0.0000	1.511E-01	0.2622	0.000E+00	0.0000	0.000E+00	0.0000	6.451E-03	0.0112
U-234	2.142E-03	0.0037	1.018E-03	0.0018	0.000E+00	0.0000	2.439E-03	0.0042	0.000E+00	0.0000	0.000E+00	0.0000	3.979E-04	0.0007
U-238	6.231E-03	0.0108	8.518E-04	0.0015	0.000E+00	0.0000	1.287E-03	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	3.197E-04	0.0006
Total	2.957E-01	0.5130	2.014E-03	0.0035	0.000E+00	0.0000	1.548E-01	0.2687	0.000E+00	0.0000	0.000E+00	0.0000	7.169E-03	0.0124

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.899E-02	0.1544	0.000E+00	0.0000	0.000E+00	0.0000	5.340E-01	0.9265
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.430E-02	0.0248	0.000E+00	0.0000	0.000E+00	0.0000	2.030E-02	0.0352
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.335E-02	0.0232	0.000E+00	0.0000	0.000E+00	0.0000	2.204E-02	0.0382
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.166E-01	0.2024	0.000E+00	0.0000	0.000E+00	0.0000	5.763E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (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
Ra-226	Ra-226	1.000E+00	2.397E+00	2.394E+00	2.389E+00	2.372E+00	2.324E+00	2.166E+00	1.788E+00	1.026E+00
Ra-226	Pb-210	1.000E+00	2.655E-02	7.115E-02	1.547E-01	4.070E-01	8.708E-01	1.248E+00	1.008E+00	4.574E-01
Ra-226	∑DSR(j)		2.423E+00	2.466E+00	2.544E+00	2.779E+00	3.195E+00	3.414E+00	2.796E+00	1.483E+00
U-234	U-234	1.000E+00	1.876E-02	1.880E-02	1.886E-02	1.910E-02	1.973E-02	2.173E-02	2.584E-02	2.442E-02
U-234	Th-230	1.000E+00	1.040E-07	3.037E-07	7.017E-07	2.096E-06	6.086E-06	2.009E-05	5.951E-05	1.792E-04
U-234	Ra-226	1.000E+00	1.492E-09	1.069E-08	5.709E-08	5.120E-07	4.286E-06	4.520E-05	3.766E-04	3.929E-03
U-234	Pb-210	1.000E+00	1.412E-11	1.422E-10	1.396E-09	3.242E-08	6.632E-07	1.481E-05	1.639E-04	1.323E-03
U-234	∑DSR(j)		1.876E-02	1.880E-02	1.886E-02	1.910E-02	1.974E-02	2.181E-02	2.644E-02	2.985E-02
U-238	U-238	1.000E+00	3.225E-02	3.227E-02	3.232E-02	3.248E-02	3.293E-02	3.428E-02	3.674E-02	3.234E-02
U-238	U-234	1.000E+00	2.661E-08	7.994E-08	1.872E-07	5.684E-07	1.706E-06	6.193E-06	2.202E-05	6.937E-05
U-238	Th-230	1.000E+00	1.017E-13	6.820E-13	3.531E-12	3.120E-11	2.607E-10	2.765E-09	2.277E-08	1.730E-07
U-238	Ra-226	1.000E+00	1.455E-12	4.503E-12	9.712E-12	3.154E-11	1.982E-10	4.427E-09	1.016E-07	3.029E-06
U-238	Pb-210	1.000E+00	5.592E-12	1.725E-11	3.665E-11	1.021E-10	3.044E-10	1.990E-09	4.298E-08	1.116E-06
U-238	∑DSR(j)		3.225E-02	3.227E-02	3.232E-02	3.248E-02	3.293E-02	3.428E-02	3.676E-02	3.242E-02

*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 = 2.500E+01 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
Ra-226	1.032E+01	1.014E+01	9.826E+00	8.995E+00	7.824E+00	7.322E+00	8.941E+00	1.685E+01
U-234	1.332E+03	1.330E+03	1.325E+03	1.309E+03	1.266E+03	1.146E+03	9.456E+02	8.374E+02
U-238	7.752E+02	7.747E+02	7.735E+02	7.696E+02	7.592E+02	7.292E+02	6.801E+02	7.712E+02

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 77.9 ± 0.2 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ra-226	3.600E-01	77.2 ± 0.2	3.439E+00	7.269E+00	3.439E+00	7.269E+00
U-234	6.800E-01	879 ± 2	3.479E-02	7.186E+02	2.119E-02	1.180E+03
U-238	6.800E-01	730 ± 1	3.815E-02	6.553E+02	3.389E-02	7.377E+02

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	8.629E-01	8.620E-01	8.602E-01	8.541E-01	8.368E-01	7.799E-01	6.436E-01	3.693E-01
Ra-226	U-234	1.000E+00	1.014E-09	7.272E-09	3.882E-08	3.481E-07	2.915E-06	3.073E-05	2.561E-04	2.671E-03
Ra-226	U-238	1.000E+00	9.892E-13	3.062E-12	6.604E-12	2.145E-11	1.348E-10	3.011E-09	6.910E-08	2.060E-06
Ra-226	ΣDOSE(j)		8.629E-01	8.620E-01	8.602E-01	8.541E-01	8.368E-01	7.799E-01	6.438E-01	3.720E-01
Pb-210	Ra-226	1.000E+00	9.556E-03	2.562E-02	5.570E-02	1.465E-01	3.135E-01	4.492E-01	3.630E-01	1.647E-01
Pb-210	U-234	1.000E+00	9.600E-12	9.672E-11	9.491E-10	2.204E-08	4.510E-07	1.007E-05	1.115E-04	8.998E-04
Pb-210	U-238	1.000E+00	3.802E-12	1.173E-11	2.492E-11	6.943E-11	2.070E-10	1.353E-09	2.923E-08	7.590E-07
Pb-210	ΣDOSE(j)		9.556E-03	2.562E-02	5.570E-02	1.465E-01	3.135E-01	4.492E-01	3.631E-01	1.656E-01
U-234	U-234	1.000E+00	1.276E-02	1.278E-02	1.283E-02	1.298E-02	1.342E-02	1.478E-02	1.757E-02	1.661E-02
U-234	U-238	1.000E+00	1.809E-08	5.436E-08	1.273E-07	3.865E-07	1.160E-06	4.211E-06	1.497E-05	4.717E-05
U-234	ΣDOSE(j)		1.276E-02	1.278E-02	1.283E-02	1.299E-02	1.342E-02	1.478E-02	1.759E-02	1.666E-02
Th-230	U-234	1.000E+00	7.069E-08	2.065E-07	4.772E-07	1.425E-06	4.139E-06	1.366E-05	4.047E-05	1.218E-04
Th-230	U-238	1.000E+00	6.919E-14	4.637E-13	2.401E-12	2.122E-11	1.773E-10	1.880E-09	1.549E-08	1.176E-07
Th-230	ΣDOSE(j)		7.069E-08	2.065E-07	4.772E-07	1.425E-06	4.139E-06	1.366E-05	4.048E-05	1.220E-04
U-238	U-238	1.000E+00	2.193E-02	2.195E-02	2.198E-02	2.209E-02	2.239E-02	2.331E-02	2.498E-02	2.199E-02

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	3.600E-01	3.593E-01	3.579E-01	3.532E-01	3.400E-01	2.975E-01	2.031E-01	5.339E-02
Ra-226	U-234	1.000E+00	0.000E+00	1.324E-09	1.189E-08	1.308E-07	1.147E-06	1.162E-05	8.092E-05	3.948E-04
Ra-226	U-238	1.000E+00	0.000E+00	1.251E-15	3.368E-14	1.234E-12	3.233E-11	1.078E-09	2.165E-08	3.004E-07
Ra-226	ΣS(j):		3.600E-01	3.593E-01	3.579E-01	3.532E-01	3.400E-01	2.975E-01	2.032E-01	5.379E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	1.100E-02	3.191E-02	9.475E-02	2.085E-01	2.911E-01	2.089E-01	5.494E-02
Pb-210	U-234	1.000E+00	0.000E+00	1.361E-11	3.611E-10	1.257E-08	2.873E-07	6.471E-06	6.582E-05	3.709E-04
Pb-210	U-238	1.000E+00	0.000E+00	9.663E-18	7.709E-16	9.032E-14	6.340E-12	5.044E-10	1.618E-08	2.757E-07
Pb-210	ΣS(j):		0.000E+00	1.100E-02	3.191E-02	9.475E-02	2.085E-01	2.912E-01	2.090E-01	5.531E-02
U-234	U-234	1.000E+00	6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.391E-01	5.531E-01	3.659E-01	8.616E-02
U-234	U-238	1.000E+00	0.000E+00	1.924E-06	5.748E-06	1.888E-05	5.436E-05	1.568E-04	3.113E-04	2.446E-04
U-234	ΣS(j):		6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.392E-01	5.532E-01	3.662E-01	8.641E-02
Th-230	U-234	1.000E+00	0.000E+00	6.115E-06	1.831E-05	6.058E-05	1.780E-04	5.527E-04	1.366E-03	2.569E-03
Th-230	U-238	1.000E+00	0.000E+00	8.665E-12	7.777E-11	8.558E-10	7.493E-09	7.567E-08	5.218E-07	2.476E-06
Th-230	ΣS(j):		0.000E+00	6.115E-06	1.831E-05	6.058E-05	1.780E-04	5.528E-04	1.367E-03	2.572E-03
[illegible]	U-238	1.000E+00	6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.392E-01	5.532E-01	3.662E-01	8.641E-02

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

RESCALC.EXE execution time = 16.61 seconds

RESRAD SUMMARY REPORT

2.6–ACRE AREA

6–INCH COVER

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	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:			
	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
	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)
	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

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

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)
	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
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

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.052E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.030E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-226	3.600E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): U-234	6.800E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	6.800E-01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
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)
	Cover depth (m)	1.500E-01	0.000E+00	---	COVER0
	Density of cover material (g/cm**3)	1.630E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.130E+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)	1.016E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	Romberg failures occurred	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+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
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.475E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.063E-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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.063E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(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	1.034E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.475E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.726E-06	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R017	Inhalation rate (m**3/yr)	1.226E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	5.512E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.500E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
	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)	4.150E+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)
	Soil ingestion rate (g/yr)	1.825E+01	3.650E+01	---	SOIL
	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	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	1.000E+00	1.000E+00	---	FGWIR
	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
	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)
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
	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10522.00 square meters	Ra-226	3.600E-01
Thickness:	3.00 meters	U-234	6.800E-01
Cover Depth:	0.15 meters	U-238	6.800E-01

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	6.358E-01	6.499E-01	6.762E-01	7.551E-01	8.960E-01	9.803E-01	8.047E-01	4.178E-01
M(t):	2.543E-02	2.600E-02	2.705E-02	3.020E-02	3.584E-02	3.921E-02	3.219E-02	1.671E-02

Maximum TDOSE(t): 9.851E-01 mrem/yr at t = 81.6 ± 0.2 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 = 8.165E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.408E-01	0.2445	4.326E-05	0.0000	0.000E+00	0.0000	6.999E-01	0.7104	0.000E+00	0.0000	0.000E+00	0.0000	1.913E-03	0.0019
U-234	7.252E-06	0.0000	3.501E-04	0.0004	0.000E+00	0.0000	7.587E-03	0.0077	0.000E+00	0.0000	0.000E+00	0.0000	1.236E-04	0.0001
U-238	4.598E-03	0.0047	3.125E-04	0.0003	0.000E+00	0.0000	7.197E-03	0.0073	0.000E+00	0.0000	0.000E+00	0.0000	1.173E-04	0.0001
Total	2.454E-01	0.2491	7.059E-04	0.0007	0.000E+00	0.0000	7.146E-01	0.7254	0.000E+00	0.0000	0.000E+00	0.0000	2.154E-03	0.0022

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 8.165E+01 years

Water Dependent Pathways

Radio-Nuclide Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.610E-02	0.0163	0.000E+00	0.0000	0.000E+00	0.0000	9.587E-01	0.9732
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.130E-03	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	1.120E-02	0.0114
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.976E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	1.520E-02	0.0154
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.221E-02	0.0225	0.000E+00	0.0000	0.000E+00	0.0000	9.851E-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 = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.520E-01	0.3964	9.161E-08	0.0000	0.000E+00	0.0000	3.616E-01	0.5688	0.000E+00	0.0000	0.000E+00	0.0000	2.458E-06	0.0000
U-234	8.842E-07	0.0000	2.517E-06	0.0000	0.000E+00	0.0000	8.862E-03	0.0139	0.000E+00	0.0000	0.000E+00	0.0000	8.885E-07	0.0000
U-238	4.815E-03	0.0076	2.250E-06	0.0000	0.000E+00	0.0000	8.424E-03	0.0132	0.000E+00	0.0000	0.000E+00	0.0000	8.445E-07	0.0000
Total	2.568E-01	0.4039	4.858E-06	0.0000	0.000E+00	0.0000	3.789E-01	0.5960	0.000E+00	0.0000	0.000E+00	0.0000	4.191E-06	0.0000

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

Water Dependent Pathways

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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.554E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.136E-01	0.9652
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.933E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.886E-03	0.0140
[illegible]8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.837E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.326E-02	0.0209
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.324E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.358E-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+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.519E-01	0.3875	2.931E-07	0.0000	0.000E+00	0.0000	3.757E-01	0.5781	0.000E+00	0.0000	0.000E+00	0.0000	8.329E-06	0.0000
U-234	8.870E-07	0.0000	7.536E-06	0.0000	0.000E+00	0.0000	8.845E-03	0.0136	0.000E+00	0.0000	0.000E+00	0.0000	2.661E-06	0.0000
U-238	4.813E-03	0.0074	6.737E-06	0.0000	0.000E+00	0.0000	8.408E-03	0.0129	0.000E+00	0.0000	0.000E+00	0.0000	2.529E-06	0.0000
Total	2.567E-01	0.3949	1.457E-05	0.0000	0.000E+00	0.0000	3.930E-01	0.6047	0.000E+00	0.0000	0.000E+00	0.0000	1.352E-05	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.594E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.277E-01	0.9658
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.021E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.917E-03	0.0137
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.723E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.329E-02	0.0204
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.034E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	6.499E-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+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.516E-01	0.3720	7.737E-07	0.0000	0.000E+00	0.0000	4.020E-01	0.5946	0.000E+00	0.0000	0.000E+00	0.0000	2.413E-05	0.0000
U-234	8.983E-07	0.0000	1.751E-05	0.0000	0.000E+00	0.0000	8.811E-03	0.0130	0.000E+00	0.0000	0.000E+00	0.0000	6.183E-06	0.0000
U-238	4.807E-03	0.0071	1.566E-05	0.0000	0.000E+00	0.0000	8.375E-03	0.0124	0.000E+00	0.0000	0.000E+00	0.0000	5.877E-06	0.0000
Total	2.564E-01	0.3792	3.394E-05	0.0001	0.000E+00	0.0000	4.192E-01	0.6200	0.000E+00	0.0000	0.000E+00	0.0000	3.619E-05	0.0001

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

Water Dependent Pathways

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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.347E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	6.539E-01	0.9670
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.422E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	8.978E-03	0.0133
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.351E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.334E-02	0.0197
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.119E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	6.762E-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-	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.
Ra-226	2.506E-01	0.3319	3.140E-06	0.0000	0.000E+00	0.0000	4.807E-01	0.6366	0.000E+00	0.0000	0.000E+00	0.0000	1.153E-04	0.0002
U-234	9.964E-07	0.0000	5.180E-05	0.0001	0.000E+00	0.0000	8.694E-03	0.0115	0.000E+00	0.0000	0.000E+00	0.0000	1.829E-05	0.0000
U-238	4.788E-03	0.0063	4.630E-05	0.0001	0.000E+00	0.0000	8.263E-03	0.0109	0.000E+00	0.0000	0.000E+00	0.0000	1.738E-05	0.0000
Total	2.554E-01	0.3382	1.012E-04	0.0001	0.000E+00	0.0000	4.976E-01	0.6590	0.000E+00	0.0000	0.000E+00	0.0000	1.509E-04	0.0002

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.001E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	7.324E-01	0.9699
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.265E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	9.191E-03	0.0122
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.055E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.352E-02	0.0179
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.833E-03	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	7.551E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.478E-01	0.2766	1.336E-05	0.0000	0.000E+00	0.0000	6.192E-01	0.6911	0.000E+00	0.0000	0.000E+00	0.0000	5.588E-04	0.0006
U-234	1.779E-06	0.0000	1.444E-04	0.0002	0.000E+00	0.0000	8.367E-03	0.0093	0.000E+00	0.0000	0.000E+00	0.0000	5.099E-05	0.0001
U-238	4.734E-03	0.0053	1.291E-04	0.0001	0.000E+00	0.0000	7.951E-03	0.0089	0.000E+00	0.0000	0.000E+00	0.0000	4.845E-05	0.0001
Total	2.526E-01	0.2819	2.869E-04	0.0003	0.000E+00	0.0000	6.355E-01	0.7093	0.000E+00	0.0000	0.000E+00	0.0000	6.582E-04	0.0007

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.540E-03	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	8.722E-01	0.9734
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.218E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	9.782E-03	0.0109
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.158E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	1.402E-02	0.0156
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.917E-03	0.0077	0.000E+00	0.0000	0.000E+00	0.0000	8.960E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.384E-01	0.2432	5.253E-05	0.0001	0.000E+00	0.0000	6.922E-01	0.7061	0.000E+00	0.0000	0.000E+00	0.0000	2.334E-03	0.0024
U-234	1.040E-05	0.0000	4.126E-04	0.0004	0.000E+00	0.0000	7.331E-03	0.0075	0.000E+00	0.0000	0.000E+00	0.0000	1.456E-04	0.0001
U-238	4.551E-03	0.0046	3.681E-04	0.0004	0.000E+00	0.0000	6.947E-03	0.0071	0.000E+00	0.0000	0.000E+00	0.0000	1.382E-04	0.0001
Total	2.430E-01	0.2478	8.333E-04	0.0009	0.000E+00	0.0000	7.065E-01	0.7207	0.000E+00	0.0000	0.000E+00	0.0000	2.618E-03	0.0027

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.007E-02	0.0205	0.000E+00	0.0000	0.000E+00	0.0000	9.530E-01	0.9722
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.765E-03	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	1.166E-02	0.0119
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.580E-03	0.0037	0.000E+00	0.0000	0.000E+00	0.0000	1.558E-02	0.0159
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.741E-02	0.0280	0.000E+00	0.0000	0.000E+00	0.0000	9.803E-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+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.133E-01	0.2651	1.112E-04	0.0001	0.000E+00	0.0000	4.989E-01	0.6201	0.000E+00	0.0000	0.000E+00	0.0000	4.966E-03	0.0062
U-234	8.656E-05	0.0001	8.217E-04	0.0010	0.000E+00	0.0000	5.149E-03	0.0064	0.000E+00	0.0000	0.000E+00	0.0000	2.911E-04	0.0004
U-238	4.065E-03	0.0051	7.291E-04	0.0009	0.000E+00	0.0000	4.723E-03	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	2.737E-04	0.0003
Total	2.175E-01	0.2703	1.662E-03	0.0021	0.000E+00	0.0000	5.088E-01	0.6323	0.000E+00	0.0000	0.000E+00	0.0000	5.531E-03	0.0069

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

Water Dependent Pathways

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.279E-02	0.0656	0.000E+00	0.0000	0.000E+00	0.0000	7.701E-01	0.9571
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.434E-03	0.0117	0.000E+00	0.0000	0.000E+00	0.0000	1.578E-02	0.0196
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.971E-03	0.0111	0.000E+00	0.0000	0.000E+00	0.0000	1.876E-02	0.0233
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.120E-02	0.0885	0.000E+00	0.0000	0.000E+00	0.0000	8.047E-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+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	1.446E-01	0.3462	9.731E-05	0.0002	0.000E+00	0.0000	1.430E-01	0.3422	0.000E+00	0.0000	0.000E+00	0.0000	4.348E-03	0.0104
U-234	1.074E-03	0.0026	6.860E-04	0.0016	0.000E+00	0.0000	2.307E-03	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	2.682E-04	0.0006
U-238	2.738E-03	0.0066	5.741E-04	0.0014	0.000E+00	0.0000	1.218E-03	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	2.155E-04	0.0005
Total	1.484E-01	0.3553	1.357E-03	0.0032	0.000E+00	0.0000	1.465E-01	0.3507	0.000E+00	0.0000	0.000E+00	0.0000	4.831E-03	0.0116

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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.899E-02	0.2130	0.000E+00	0.0000	0.000E+00	0.0000	3.810E-01	0.9121
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.430E-02	0.0342	0.000E+00	0.0000	0.000E+00	0.0000	1.864E-02	0.0446
8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.335E-02	0.0320	0.000E+00	0.0000	0.000E+00	0.0000	1.810E-02	0.0433
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.166E-01	0.2792	0.000E+00	0.0000	0.000E+00	0.0000	4.178E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (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
Ra-226	Ra-226	1.000E+00	1.680E+00	1.678E+00	1.674E+00	1.661E+00	1.622E+00	1.497E+00	1.201E+00	6.196E-01
Ra-226	Pb-210	1.000E+00	2.446E-02	6.542E-02	1.421E-01	3.739E-01	8.005E-01	1.151E+00	9.387E-01	4.388E-01
Ra-226	∑DSR(j)		1.705E+00	1.744E+00	1.816E+00	2.034E+00	2.423E+00	2.647E+00	2.139E+00	1.058E+00
U-234	U-234	1.000E+00	1.307E-02	1.311E-02	1.320E-02	1.352E-02	1.438E-02	1.710E-02	2.277E-02	2.369E-02
U-234	Th-230	1.000E+00	4.976E-08	1.418E-07	3.251E-07	9.747E-07	2.896E-06	1.030E-05	3.534E-05	1.324E-04
U-234	Ra-226	1.000E+00	1.030E-09	7.445E-09	3.988E-08	3.580E-07	2.990E-06	3.120E-05	2.523E-04	2.336E-03
U-234	Pb-210	1.000E+00	1.335E-11	1.320E-10	1.286E-09	2.980E-08	6.097E-07	1.365E-05	1.522E-04	1.257E-03
U-234	∑DSR(j)		1.307E-02	1.311E-02	1.320E-02	1.352E-02	1.439E-02	1.715E-02	2.321E-02	2.741E-02
U-238	U-238	1.000E+00	1.950E-02	1.954E-02	1.962E-02	1.988E-02	2.062E-02	2.291E-02	2.757E-02	2.655E-02
U-238	U-234	1.000E+00	1.853E-08	5.577E-08	1.310E-07	4.023E-07	1.243E-06	4.872E-06	1.941E-05	6.728E-05
U-238	Th-230	1.000E+00	5.038E-14	3.245E-13	1.651E-12	1.456E-11	1.242E-10	1.418E-09	1.353E-08	1.278E-07
U-238	Ra-226	1.000E+00	1.454E-12	4.498E-12	9.654E-12	3.002E-11	1.611E-10	3.123E-09	6.832E-08	1.817E-06
U-238	Pb-210	1.000E+00	5.592E-12	1.725E-11	3.665E-11	1.021E-10	3.032E-10	1.899E-09	4.011E-08	1.067E-06
U-238	∑DSR(j)		1.950E-02	1.954E-02	1.962E-02	1.988E-02	2.062E-02	2.292E-02	2.759E-02	2.662E-02

*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 = 2.500E+01 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
Ra-226	1.467E+01	1.434E+01	1.376E+01	1.229E+01	1.032E+01	9.444E+00	1.169E+01	2.362E+01
U-234	1.913E+03	1.907E+03	1.893E+03	1.850E+03	1.738E+03	1.457E+03	1.077E+03	9.120E+02
U-238	1.282E+03	1.279E+03	1.274E+03	1.257E+03	1.212E+03	1.091E+03	9.062E+02	9.392E+02

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 81.6 ± 0.2 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ra-226	3.600E-01	80.3 ± 0.2	2.663E+00	9.387E+00	2.663E+00	9.387E+00
U-234	6.800E-01	879 ± 2	3.261E-02	7.665E+02	1.647E-02	1.518E+03
U-238	6.800E-01	879 ± 2	3.257E-02	7.676E+02	2.236E-02	1.118E+03

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	6.048E-01	6.041E-01	6.027E-01	5.978E-01	5.840E-01	5.388E-01	4.322E-01	2.230E-01
Ra-226	U-234	1.000E+00	7.004E-10	5.063E-09	2.712E-08	2.434E-07	2.033E-06	2.122E-05	1.716E-04	1.588E-03
Ra-226	U-238	1.000E+00	9.890E-13	3.059E-12	6.565E-12	2.041E-11	1.095E-10	2.124E-09	4.646E-08	1.235E-06
Ra-226	∑DOSE(j)		6.048E-01	6.041E-01	6.027E-01	5.978E-01	5.840E-01	5.388E-01	4.324E-01	2.246E-01
Pb-210	Ra-226	1.000E+00	8.804E-03	2.355E-02	5.117E-02	1.346E-01	2.882E-01	4.143E-01	3.379E-01	1.580E-01
Pb-210	U-234	1.000E+00	9.079E-12	8.979E-11	8.747E-10	2.026E-08	4.146E-07	9.280E-06	1.035E-04	8.545E-04
Pb-210	U-238	1.000E+00	3.802E-12	1.173E-11	2.492E-11	6.942E-11	2.061E-10	1.291E-09	2.727E-08	7.253E-07
Pb-210	∑DOSE(j)		8.804E-03	2.355E-02	5.117E-02	1.346E-01	2.882E-01	4.143E-01	3.380E-01	1.588E-01
U-234	U-234	1.000E+00	8.886E-03	8.917E-03	8.978E-03	9.190E-03	9.778E-03	1.163E-02	1.548E-02	1.611E-02
U-234	U-238	1.000E+00	1.260E-08	3.792E-08	8.909E-08	2.736E-07	8.455E-07	3.313E-06	1.320E-05	4.575E-05
U-234	∑DOSE(j)		8.886E-03	8.917E-03	8.978E-03	9.190E-03	9.779E-03	1.163E-02	1.550E-02	1.615E-02
Th-230	U-234	1.000E+00	3.384E-08	9.640E-08	2.211E-07	6.628E-07	1.970E-06	7.001E-06	2.403E-05	9.000E-05
Th-230	U-238	1.000E+00	3.426E-14	2.207E-13	1.123E-12	9.898E-12	8.446E-11	9.641E-10	9.200E-09	8.692E-08
Th-230	∑DOSE(j)		3.384E-08	9.640E-08	2.211E-07	6.628E-07	1.970E-06	7.002E-06	2.404E-05	9.009E-05
U-238	U-238	1.000E+00	1.326E-02	1.329E-02	1.334E-02	1.352E-02	1.402E-02	1.558E-02	1.875E-02	1.805E-02

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	3.600E-01	3.593E-01	3.579E-01	3.532E-01	3.400E-01	2.975E-01	2.031E-01	5.339E-02
Ra-226	U-234	1.000E+00	0.000E+00	1.324E-09	1.189E-08	1.308E-07	1.147E-06	1.162E-05	8.092E-05	3.948E-04
Ra-226	U-238	1.000E+00	0.000E+00	1.251E-15	3.368E-14	1.234E-12	3.233E-11	1.078E-09	2.165E-08	3.004E-07
Ra-226	∑S(j):		3.600E-01	3.593E-01	3.579E-01	3.532E-01	3.400E-01	2.975E-01	2.032E-01	5.379E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	1.100E-02	3.191E-02	9.475E-02	2.085E-01	2.911E-01	2.089E-01	5.494E-02
Pb-210	U-234	1.000E+00	0.000E+00	1.361E-11	3.611E-10	1.257E-08	2.873E-07	6.471E-06	6.582E-05	3.709E-04
Pb-210	U-238	1.000E+00	0.000E+00	9.663E-18	7.709E-16	9.032E-14	6.340E-12	5.044E-10	1.618E-08	2.757E-07
Pb-210	∑S(j):		0.000E+00	1.100E-02	3.191E-02	9.475E-02	2.085E-01	2.912E-01	2.090E-01	5.531E-02
U-234	U-234	1.000E+00	6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.391E-01	5.531E-01	3.659E-01	8.616E-02
U-234	U-238	1.000E+00	0.000E+00	1.924E-06	5.748E-06	1.888E-05	5.436E-05	1.568E-04	3.113E-04	2.446E-04
U-234	∑S(j):		6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.392E-01	5.532E-01	3.662E-01	8.641E-02
Th-230	U-234	1.000E+00	0.000E+00	6.115E-06	1.831E-05	6.058E-05	1.780E-04	5.527E-04	1.366E-03	2.569E-03
Th-230	U-238	1.000E+00	0.000E+00	8.665E-12	7.777E-11	8.558E-10	7.493E-09	7.567E-08	5.218E-07	2.476E-06
Th-230	∑S(j):		0.000E+00	6.115E-06	1.831E-05	6.058E-05	1.780E-04	5.528E-04	1.367E-03	2.572E-03
	U-238	1.000E+00	6.800E-01	6.786E-01	6.758E-01	6.661E-01	6.392E-01	5.532E-01	3.662E-01	8.641E-02

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

RESCALC.EXE execution time = 15.54 seconds

Total water/soil iteration failures = 2.

RESRAD SUMMARY REPORT

3.5–ACRE AREA

2–FOOT AND 4–FOOT COVER

SIMULATION 1

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	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:			
	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
	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)
	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

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

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)
	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
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

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	6.670E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	9.000E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	2.580E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.250E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Th-228	1.250E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-232	1.250E-01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	1.250E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.250E-01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
	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)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.130E+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)	1.016E+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	---	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+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
	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.548E+03	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	3.548E+03	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.808E-05	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.617E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-232				
	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.617E-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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.519E-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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.519E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(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	2.765E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
	Leach rate (/yr)	0.000E+00	0.000E+00	3.947E-03	ALEACH(3)
	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.617E-06	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R017	Inhalation rate (m**3/yr)	1.226E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	5.512E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.500E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
	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)	4.150E+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)
	Soil ingestion rate (g/yr)	1.825E+01	3.650E+01	---	SOIL
	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.334E+00	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	1.000E+00	1.000E+00	---	FGWIR
	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
	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)
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
	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	667.00 square meters
Thickness:	0.90 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
Ra-226	1.250E-01
Th-228	1.250E-01
Th-232	1.250E-01
U-234	1.250E-01
U-238	1.250E-01

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.296E+00	1.217E+00	1.196E+00	1.476E+00	1.814E+00	1.849E+00	1.760E+00	1.513E+00
M(t):	5.182E-02	4.868E-02	4.784E-02	5.904E-02	7.255E-02	7.396E-02	7.042E-02	6.053E-02

Maximum TDOSE(t): 1.857E+00 mrem/yr at t = 65.5 ± 0.1 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 = 6.552E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	6.164E-01	0.3320	2.125E-04	0.0001	0.000E+00	0.0000	2.014E-01	0.1084	0.000E+00	0.0000	0.000E+00	0.0000	8.227E-03	0.0044
Th-228	2.385E-11	0.0000	1.118E-13	0.0000	0.000E+00	0.0000	6.076E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.834E-14	0.0000
Th-232	8.908E-01	0.4798	1.562E-02	0.0084	0.000E+00	0.0000	1.088E-01	0.0586	0.000E+00	0.0000	0.000E+00	0.0000	5.672E-03	0.0031
U-234	2.130E-05	0.0000	7.250E-04	0.0004	0.000E+00	0.0000	9.018E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.276E-04	0.0001
U-238	6.015E-03	0.0032	6.472E-04	0.0003	0.000E+00	0.0000	8.560E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.161E-04	0.0001
Total	1.513E+00	0.8150	1.720E-02	0.0093	0.000E+00	0.0000	3.119E-01	0.1680	0.000E+00	0.0000	0.000E+00	0.0000	1.434E-02	0.0077

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 6.552E+01 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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	8.262E-01	0.4450
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	2.406E-11	0.0000
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	1.021E+00	0.5499
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	1.876E-03	0.0010
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.734E-03	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	1.857E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	6.371E-01	0.4918	7.069E-05	0.0001	0.000E+00	0.0000	1.006E-01	0.0776	0.000E+00	0.0000	0.000E+00	0.0000	1.667E-03	0.0013
Th-228	4.876E-01	0.3763	2.285E-03	0.0018	0.000E+00	0.0000	1.251E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	7.838E-04	0.0006
Th-232	2.341E-02	0.0181	1.297E-02	0.0100	0.000E+00	0.0000	1.085E-02	0.0084	0.000E+00	0.0000	0.000E+00	0.0000	3.259E-03	0.0025
U-234	2.370E-05	0.0000	1.039E-03	0.0008	0.000E+00	0.0000	1.302E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	3.264E-04	0.0003
U-238	8.635E-03	0.0067	9.290E-04	0.0007	0.000E+00	0.0000	1.238E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	3.102E-04	0.0002
Total	1.157E+00	0.8928	1.729E-02	0.0133	0.000E+00	0.0000	1.152E-01	0.0889	0.000E+00	0.0000	0.000E+00	0.0000	6.347E-03	0.0049

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.394E-01	0.5707
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.919E-01	0.3797
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	5.049E-02	0.0390
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	2.691E-03	0.0021
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	1.111E-02	0.0086
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	1.296E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

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.
Ra-226	6.368E-01	0.5232	7.616E-05	0.0001	0.000E+00	0.0000	1.046E-01	0.0859	0.000E+00	0.0000	0.000E+00	0.0000	1.919E-03	0.0016
Th-228	3.394E-01	0.2788	1.590E-03	0.0013	0.000E+00	0.0000	8.708E-04	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.456E-04	0.0004
Th-232	7.883E-02	0.0648	1.306E-02	0.0107	0.000E+00	0.0000	2.224E-02	0.0183	0.000E+00	0.0000	0.000E+00	0.0000	3.468E-03	0.0028
U-234	2.358E-05	0.0000	1.034E-03	0.0008	0.000E+00	0.0000	1.295E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	3.246E-04	0.0003
U-238	8.587E-03	0.0071	9.239E-04	0.0008	0.000E+00	0.0000	1.231E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	3.085E-04	0.0003
Total	1.064E+00	0.8739	1.669E-02	0.0137	0.000E+00	0.0000	1.302E-01	0.1070	0.000E+00	0.0000	0.000E+00	0.0000	6.565E-03	0.0054

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

Water Dependent Pathways

Radio-	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.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.434E-01	0.6108
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.424E-01	0.2813
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	1.176E-01	0.0966
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	2.676E-03	0.0022
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	1.105E-02	0.0091
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.217E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

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.
Ra-226	6.362E-01	0.5319	8.654E-05	0.0001	0.000E+00	0.0000	1.121E-01	0.0937	0.000E+00	0.0000	0.000E+00	0.0000	2.397E-03	0.0020
Th-228	1.644E-01	0.1375	7.705E-04	0.0006	0.000E+00	0.0000	4.218E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.643E-04	0.0002
Th-232	2.072E-01	0.1732	1.339E-02	0.0112	0.000E+00	0.0000	4.136E-02	0.0346	0.000E+00	0.0000	0.000E+00	0.0000	3.872E-03	0.0032
U-234	2.333E-05	0.0000	1.022E-03	0.0009	0.000E+00	0.0000	1.280E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	3.210E-04	0.0003
U-238	8.493E-03	0.0071	9.138E-04	0.0008	0.000E+00	0.0000	1.217E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	3.051E-04	0.0003
Total	1.016E+00	0.8497	1.618E-02	0.0135	0.000E+00	0.0000	1.564E-01	0.1308	0.000E+00	0.0000	0.000E+00	0.0000	7.160E-03	0.0060

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-	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.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.507E-01	0.6277
[illegible]28	0.000E+00	0.0000	0.000E+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-01	0.1387
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	2.658E-01	0.2222
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	2.647E-03	0.0022
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	1.093E-02	0.0091
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

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.
Ra-226	6.339E-01	0.4295	1.177E-04	0.0001	0.000E+00	0.0000	1.346E-01	0.0912	0.000E+00	0.0000	0.000E+00	0.0000	3.832E-03	0.0026
Th-228	1.302E-02	0.0088	6.100E-05	0.0000	0.000E+00	0.0000	3.337E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.093E-05	0.0000
Th-232	5.769E-01	0.3908	1.456E-02	0.0099	0.000E+00	0.0000	8.093E-02	0.0548	0.000E+00	0.0000	0.000E+00	0.0000	4.875E-03	0.0033
U-234	2.257E-05	0.0000	9.836E-04	0.0007	0.000E+00	0.0000	1.231E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	3.089E-04	0.0002
U-238	8.171E-03	0.0055	8.791E-04	0.0006	0.000E+00	0.0000	1.170E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	2.936E-04	0.0002
Total	1.232E+00	0.8347	1.660E-02	0.0112	0.000E+00	0.0000	2.180E-01	0.1477	0.000E+00	0.0000	0.000E+00	0.0000	9.330E-03	0.0063

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-	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.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.725E-01	0.5234
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.313E-02	0.0089
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	6.772E-01	0.4588
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	2.546E-03	0.0017
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	1.051E-02	0.0071
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	1.476E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	6.276E-01	0.3460	1.741E-04	0.0001	0.000E+00	0.0000	1.751E-01	0.0965	0.000E+00	0.0000	0.000E+00	0.0000	6.440E-03	0.0036
Th-228	9.277E-06	0.0000	4.347E-08	0.0000	0.000E+00	0.0000	2.373E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.491E-08	0.0000
Th-232	8.647E-01	0.4767	1.553E-02	0.0086	0.000E+00	0.0000	1.069E-01	0.0589	0.000E+00	0.0000	0.000E+00	0.0000	5.606E-03	0.0031
U-234	2.119E-05	0.0000	8.812E-04	0.0005	0.000E+00	0.0000	1.100E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.767E-04	0.0002
U-238	7.317E-03	0.0040	7.873E-04	0.0004	0.000E+00	0.0000	1.045E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.629E-04	0.0001
Total	1.500E+00	0.8268	1.737E-02	0.0096	0.000E+00	0.0000	2.841E-01	0.1566	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-02	0.0069

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.093E-01	0.4462
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.359E-06	0.0000
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	9.927E-01	0.5473
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	2.279E-03	0.0013
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	9.413E-03	0.0052
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	1.814E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	6.056E-01	0.3275	2.210E-04	0.0001	0.000E+00	0.0000	2.060E-01	0.1114	0.000E+00	0.0000	0.000E+00	0.0000	8.646E-03	0.0047
Th-228	8.967E-17	0.0000	4.202E-19	0.0000	0.000E+00	0.0000	2.276E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.442E-19	0.0000
Th-232	8.910E-01	0.4819	1.562E-02	0.0084	0.000E+00	0.0000	1.084E-01	0.0586	0.000E+00	0.0000	0.000E+00	0.0000	5.672E-03	0.0031
U-234	2.403E-05	0.0000	6.001E-04	0.0003	0.000E+00	0.0000	7.447E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.884E-04	0.0001
U-238	4.972E-03	0.0027	5.351E-04	0.0003	0.000E+00	0.0000	7.050E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.787E-04	0.0001
Total	1.502E+00	0.8121	1.697E-02	0.0092	0.000E+00	0.0000	3.158E-01	0.1708	0.000E+00	0.0000	0.000E+00	0.0000	1.468E-02	0.0079

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

Water Dependent Pathways

Radio-	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.
[illegible]26	0.000E+00	0.0000	0.000E+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	0.4437
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.046E-17	0.0000
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	1.021E+00	0.5520
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	1.557E-03	0.0008
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.391E-03	0.0035
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	1.849E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ra-226	5.468E-01	0.3106	2.047E-04	0.0001	0.000E+00	0.0000	1.854E-01	0.1053	0.000E+00	0.0000	0.000E+00	0.0000	8.041E-03	0.0046
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-232	8.902E-01	0.5057	1.560E-02	0.0089	0.000E+00	0.0000	1.059E-01	0.0601	0.000E+00	0.0000	0.000E+00	0.0000	5.666E-03	0.0032
U-234	6.997E-05	0.0000	2.017E-04	0.0001	0.000E+00	0.0000	2.616E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.394E-05	0.0000
U-238	1.649E-03	0.0009	1.776E-04	0.0001	0.000E+00	0.0000	2.287E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.929E-05	0.0000
Total	1.439E+00	0.8172	1.619E-02	0.0092	0.000E+00	0.0000	2.917E-01	0.1657	0.000E+00	0.0000	0.000E+00	0.0000	1.383E-02	0.0079

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

Water Dependent Pathways

Radio-	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.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.404E-01	0.4206
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-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	1.017E+00	0.5779
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	5.972E-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	2.114E-03	0.0012
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.760E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	3.823E-01	0.2526	1.431E-04	0.0001	0.000E+00	0.0000	1.192E-01	0.0788	0.000E+00	0.0000	0.000E+00	0.0000	5.622E-03	0.0037
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-232	8.873E-01	0.5864	1.555E-02	0.0103	0.000E+00	0.0000	9.703E-02	0.0641	0.000E+00	0.0000	0.000E+00	0.0000	5.648E-03	0.0037
U-234	2.975E-04	0.0002	8.395E-06	0.0000	0.000E+00	0.0000	9.647E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.533E-06	0.0000
U-238	3.474E-05	0.0000	3.739E-06	0.0000	0.000E+00	0.0000	4.462E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E-06	0.0000
Total	1.270E+00	0.8392	1.571E-02	0.0104	0.000E+00	0.0000	2.163E-01	0.1430	0.000E+00	0.0000	0.000E+00	0.0000	1.128E-02	0.0075

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-	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.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.072E-01	0.3352
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-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	1.006E+00	0.6645
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	4.089E-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	4.419E-05	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	1.513E+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
Ra-226	Ra-226	1.000E+00	5.894E+00	5.891E+00	5.885E+00	5.864E+00	5.802E+00	5.592E+00	5.034E+00	3.483E+00
Ra-226	Pb-210	1.000E+00	2.067E-02	5.557E-02	1.208E-01	3.167E-01	6.720E-01	9.714E-01	8.896E-01	5.751E-01
Ra-226	∑DSR(j)		5.915E+00	5.947E+00	6.006E+00	6.180E+00	6.474E+00	6.564E+00	5.923E+00	4.058E+00
Th-228	Th-228	1.000E+00	3.935E+00	2.739E+00	1.327E+00	1.051E-01	7.487E-05	7.237E-16	0.000E+00	0.000E+00
Th-232	Th-232	1.000E+00	1.694E-01	1.694E-01	1.694E-01	1.693E-01	1.692E-01	1.689E-01	1.678E-01	1.642E-01
Th-232	Ra-228	1.000E+00	2.039E-01	5.848E-01	1.219E+00	2.522E+00	3.381E+00	3.451E+00	3.429E+00	3.355E+00
Th-232	Th-228	1.000E+00	3.062E-02	1.867E-01	7.382E-01	2.726E+00	4.392E+00	4.546E+00	4.541E+00	4.525E+00
Th-232	∑DSR(j)		4.039E-01	9.408E-01	2.126E+00	5.418E+00	7.942E+00	8.165E+00	8.138E+00	8.044E+00
U-234	U-234	1.000E+00	2.153E-02	2.141E-02	2.117E-02	2.036E-02	1.821E-02	1.233E-02	4.042E-03	8.145E-05
U-234	Th-230	1.000E+00	1.575E-07	4.653E-07	1.075E-06	3.154E-06	8.667E-06	2.375E-05	4.483E-05	5.366E-05
U-234	Ra-226	1.000E+00	3.776E-09	2.658E-08	1.404E-07	1.241E-06	1.006E-05	9.540E-05	6.017E-04	2.708E-03
U-234	Pb-210	1.000E+00	7.789E-12	1.008E-10	1.060E-09	2.494E-08	4.971E-07	1.012E-05	8.971E-05	4.276E-04
U-234	∑DSR(j)		2.153E-02	2.141E-02	2.117E-02	2.037E-02	1.823E-02	1.246E-02	4.778E-03	3.271E-03
U-238	U-238	1.000E+00	8.889E-02	8.840E-02	8.743E-02	8.411E-02	7.530E-02	5.113E-02	1.691E-02	3.520E-04
U-238	U-234	1.000E+00	3.049E-08	9.102E-08	2.101E-07	6.061E-07	1.575E-06	3.513E-06	3.445E-06	2.314E-07
U-238	Th-230	1.000E+00	1.509E-13	1.032E-12	5.369E-12	4.658E-11	3.644E-10	3.074E-09	1.406E-08	2.701E-08
U-238	Ra-226	1.000E+00	2.662E-15	4.020E-14	4.686E-13	1.221E-11	2.822E-10	8.292E-09	1.310E-07	1.127E-06
U-238	Pb-210	1.000E+00	4.649E-18	1.230E-16	2.755E-15	1.893E-13	1.102E-11	7.491E-10	1.829E-08	1.763E-07
U-238	∑DSR(j)		8.889E-02	8.840E-02	8.743E-02	8.411E-02	7.530E-02	5.113E-02	1.691E-02	3.535E-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 ≤ 0.5 yr) daughters.

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

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	4.226E+00	4.204E+00	4.163E+00	4.045E+00	3.862E+00	3.809E+00	4.221E+00	6.161E+00
Th-228	6.353E+00	9.127E+00	1.884E+01	2.380E+02	3.339E+05	*8.192E+14	*8.192E+14	*8.192E+14
Th-232	6.189E+01	2.657E+01	1.176E+01	4.614E+00	3.148E+00	3.062E+00	3.072E+00	3.108E+00
U-234	1.161E+03	1.168E+03	1.181E+03	1.227E+03	1.371E+03	2.007E+03	5.233E+03	7.643E+03
U-238	2.812E+02	2.828E+02	2.859E+02	2.972E+02	3.320E+02	4.890E+02	1.478E+03	7.071E+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 = 65.5 ± 0.1 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ra-226	1.250E-01	67.3 ± 0.1	6.610E+00	3.782E+00	6.609E+00	3.782E+00
Th-228	1.250E-01	0.000E+00	3.935E+00	6.353E+00	1.925E-10	1.299E+11
Th-232	1.250E-01	73.3 ± 0.1	8.168E+00	3.061E+00	8.167E+00	3.061E+00
U-234	1.250E-01	0.000E+00	2.153E-02	1.161E+03	1.501E-02	1.666E+03
U-238	1.250E-01	0.000E+00	8.889E-02	2.812E+02	6.187E-02	4.041E+02

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	7.368E-01	7.364E-01	7.356E-01	7.329E-01	7.253E-01	6.990E-01	6.292E-01	4.353E-01
Ra-226	U-234	1.000E+00	4.720E-10	3.322E-09	1.755E-08	1.551E-07	1.257E-06	1.193E-05	7.521E-05	3.385E-04
Ra-226	U-238	1.000E+00	3.328E-16	5.025E-15	5.857E-14	1.526E-12	3.528E-11	1.036E-09	1.637E-08	1.409E-07
Ra-226	∑DOSE(j)		7.368E-01	7.364E-01	7.356E-01	7.329E-01	7.253E-01	6.991E-01	6.293E-01	4.357E-01
Pb-210	Ra-226	1.000E+00	2.584E-03	6.946E-03	1.510E-02	3.959E-02	8.400E-02	1.214E-01	1.112E-01	7.189E-02
Pb-210	U-234	1.000E+00	9.737E-13	1.260E-11	1.325E-10	3.117E-09	6.213E-08	1.264E-06	1.121E-05	5.345E-05
Pb-210	U-238	1.000E+00	5.811E-19	1.537E-17	3.444E-16	2.366E-14	1.377E-12	9.363E-11	2.286E-09	2.203E-08
Pb-210	∑DOSE(j)		2.584E-03	6.946E-03	1.510E-02	3.959E-02	8.400E-02	1.214E-01	1.112E-01	7.195E-02
Th-228	Th-228	1.000E+00	4.919E-01	3.424E-01	1.659E-01	1.313E-02	9.359E-06	9.046E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	3.827E-03	2.333E-02	9.228E-02	3.407E-01	5.490E-01	5.682E-01	5.677E-01	5.656E-01
Th-228	∑DOSE(j)		4.957E-01	3.657E-01	2.582E-01	3.539E-01	5.490E-01	5.682E-01	5.677E-01	5.656E-01
Th-232	Th-232	1.000E+00	2.117E-02	2.117E-02	2.117E-02	2.117E-02	2.115E-02	2.111E-02	2.098E-02	2.052E-02
Ra-228	Th-232	1.000E+00	2.549E-02	7.309E-02	1.523E-01	3.153E-01	4.226E-01	4.313E-01	4.287E-01	4.194E-01
U-234	U-234	1.000E+00	2.691E-03	2.676E-03	2.647E-03	2.545E-03	2.277E-03	1.541E-03	5.052E-04	1.018E-05
U-234	U-238	1.000E+00	3.811E-09	1.138E-08	2.626E-08	7.577E-08	1.969E-07	4.391E-07	4.306E-07	2.892E-08
U-234	∑DOSE(j)		2.691E-03	2.676E-03	2.647E-03	2.545E-03	2.277E-03	1.541E-03	5.056E-04	1.021E-05
Th-230	U-234	1.000E+00	1.969E-08	5.817E-08	1.343E-07	3.943E-07	1.083E-06	2.969E-06	5.604E-06	6.708E-06
Th-230	U-238	1.000E+00	1.886E-14	1.290E-13	6.711E-13	5.823E-12	4.555E-11	3.842E-10	1.757E-09	3.377E-09
Th-230	∑DOSE(j)		1.969E-08	5.817E-08	1.343E-07	3.943E-07	1.083E-06	2.969E-06	5.606E-06	6.711E-06
U-238	U-238	1.000E+00	1.111E-02	1.105E-02	1.093E-02	1.051E-02	9.413E-03	6.391E-03	2.114E-03	4.400E-05

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	1.250E-01	1.249E-01	1.248E-01	1.244E-01	1.231E-01	1.188E-01	1.072E-01	7.496E-02
Ra-226	U-234	1.000E+00	0.000E+00	2.432E-10	2.180E-09	2.389E-08	2.066E-07	2.008E-06	1.278E-05	5.825E-05
Ra-226	U-238	1.000E+00	0.000E+00	2.297E-16	6.165E-15	2.238E-13	5.706E-12	1.737E-10	2.779E-09	2.424E-08
Ra-226	∑S(j):		1.250E-01	1.249E-01	1.248E-01	1.244E-01	1.231E-01	1.188E-01	1.072E-01	7.502E-02
Pb-210	Ra-226	1.000E+00	0.000E+00	3.819E-03	1.108E-02	3.287E-02	7.256E-02	1.068E-01	9.997E-02	6.990E-02
Pb-210	U-234	1.000E+00	0.000E+00	2.500E-12	6.619E-11	2.290E-09	5.140E-08	1.097E-06	1.004E-05	5.192E-05
Pb-210	U-238	1.000E+00	0.000E+00	1.774E-18	1.411E-16	1.637E-14	1.117E-12	8.077E-11	2.044E-09	2.140E-08
Pb-210	∑S(j):		0.000E+00	3.819E-03	1.108E-02	3.287E-02	7.256E-02	1.068E-01	9.998E-02	6.995E-02
Th-228	Th-228	1.000E+00	1.250E-01	8.701E-02	4.215E-02	3.337E-03	2.378E-06	2.299E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	2.327E-03	1.548E-02	6.963E-02	1.166E-01	1.210E-01	1.209E-01	1.205E-01
Th-228	∑S(j):		1.250E-01	8.933E-02	5.763E-02	7.297E-02	1.166E-01	1.210E-01	1.209E-01	1.205E-01
Th-232	Th-232	1.000E+00	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.249E-01	1.248E-01	1.244E-01
Ra-228	Th-232	1.000E+00	0.000E+00	1.417E-02	3.772E-02	8.618E-02	1.181E-01	1.210E-01	1.209E-01	1.205E-01
U-234	U-234	1.000E+00	1.250E-01	1.243E-01	1.229E-01	1.183E-01	1.059E-01	7.196E-02	2.385E-02	4.997E-04
U-234	U-238	1.000E+00	0.000E+00	3.524E-07	1.046E-06	3.353E-06	9.008E-06	2.040E-05	2.029E-05	1.419E-06
U-234	∑S(j):		1.250E-01	1.243E-01	1.229E-01	1.183E-01	1.059E-01	7.198E-02	2.387E-02	5.012E-04
Th-230	U-234	1.000E+00	0.000E+00	1.122E-06	3.348E-06	1.095E-05	3.110E-05	8.640E-05	1.645E-04	2.007E-04
Th-230	U-238	1.000E+00	0.000E+00	1.589E-12	1.420E-11	1.537E-10	1.286E-09	1.113E-08	5.151E-08	1.010E-07
Th-230	∑S(j):		0.000E+00	1.122E-06	3.348E-06	1.095E-05	3.110E-05	8.641E-05	1.645E-04	2.008E-04
U-238	U-238	1.000E+00	1.250E-01	1.243E-01	1.229E-01	1.183E-01	1.059E-01	7.198E-02	2.387E-02	5.012E-04

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

RESCALC.EXE execution time = 64.00 seconds

RESRAD SUMMARY REPORT

3.5–ACRE AREA

2-FOOT COVER

SIMULATION 2

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

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	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:			
	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
	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)
	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

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

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)
	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
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

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.416E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.190E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E-02	1.000E-02	---	T(6)
R011	Times for calculations (yr)	3.000E-02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-226	2.500E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Th-228	2.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-232	2.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	2.500E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	2.500E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
	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)	6.100E-01	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)	1.000E-04	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.130E+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)	1.016E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+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
	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.548E+03	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	3.548E+03	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.837E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.452E-05	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-232				
	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.452E-05	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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.126E-02	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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.126E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(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	2.067E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
	Leach rate (/yr)	0.000E+00	0.000E+00	2.951E-02	ALEACH(3)
	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.452E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R017	Inhalation rate (m**3/yr)	not used	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	not used	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	not used	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	not used	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	not used	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	not used	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	not used	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)
	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
	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)	4.150E+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)
	Soil ingestion rate (g/yr)	not used	3.650E+01	---	SOIL
	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	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	1.000E+00	1.000E+00	---	FGWIR
	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
	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)
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
	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	14164.00 square meters
Thickness:	0.15 meters
Cover Depth:	0.61 meters

Initial Soil Concentrations, pCi/g	
Ra-226	2.500E+00
Th-228	2.500E+00
Th-232	2.500E+00
U-234	2.500E+00
U-238	2.500E+00

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	5.752E-01	6.483E-01	7.714E-01	1.036E+00	1.261E+00	1.291E+00	1.133E+00	7.706E-01
M(t):	2.301E-02	2.593E-02	3.086E-02	4.144E-02	5.043E-02	5.162E-02	4.532E-02	3.082E-02

Maximum TDOSE(t): 1.309E+00 mrem/yr at t = 62.6 ± 0.1 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 = 6.259E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
de	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.317E-01	0.6356	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	8.839E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-01	0.3500	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.874E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E-00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.599E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.291E+00	0.9864	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 6.259E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.562E-03	0.0073	0.000E+00	0.0000	0.000E+00	0.0000	8.413E-01	0.6429
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	8.839E-13	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.229E-03	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	4.593E-01	0.3510
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.625E-03	0.0028	0.000E+00	0.0000	0.000E+00	0.0000	4.112E-03	0.0031
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.447E-03	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	3.907E-03	0.0030
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.786E-02	0.0136	0.000E+00	0.0000	0.000E+00	0.0000	1.309E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.024E-01	0.8733	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	6.249E-03	0.0109	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.398E-02	0.0938	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.398E-03	0.0111	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.081E-03	0.0106	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.751E-01	0.9997	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.484E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.024E-01	0.8733
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.249E-03	0.0109
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.759E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.399E-02	0.0939
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.025E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.468E-03	0.0112
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.678E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.148E-03	0.0107
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	5.752E-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+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.220E-01	0.8051	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	4.349E-03	0.0067	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-01	0.1690	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.140E-03	0.0095	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.837E-03	0.0090	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.478E-01	0.9993	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
[illegible]6	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.220E-01	0.8051
[illegible]28	0.000E+00	0.0000	0.000E+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-03	0.0067
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.962E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-01	0.1690
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.154E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	6.356E-03	0.0098
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.047E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	6.041E-03	0.0093
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.852E-04	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	6.483E-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+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.575E-01	0.7227	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	2.107E-03	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.995E-01	0.2586	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.654E-03	0.0073	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.374E-03	0.0070	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.702E-01	0.9984	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.577E-01	0.7229
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.107E-03	0.0027
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.997E-01	0.2588
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.912E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	6.145E-03	0.0080
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.669E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	5.841E-03	0.0076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	7.714E-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-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.553E-01	0.6326	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	1.668E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.678E-01	0.3550	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.236E-03	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.026E-03	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.032E+00	0.9957	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.808E-04	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	6.563E-01	0.6335
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.668E-04	0.0002
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.884E-04	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	3.687E-01	0.3559
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	5.543E-03	0.0054
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-03	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	5.269E-03	0.0051
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.419E-03	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	1.036E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.912E-01	0.6276	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	1.188E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.541E-01	0.3601	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-03	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-03	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E+00	0.9905	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.907E-03	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	7.961E-01	0.6314
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-07	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.678E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	4.557E-01	0.3615
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.734E-03	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	4.591E-03	0.0036
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.599E-03	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	4.363E-03	0.0035
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.192E-02	0.0095	0.000E+00	0.0000	0.000E+00	0.0000	1.261E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.135E-01	0.6304	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	1.146E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.575E-01	0.3545	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.099E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.824E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E+00	0.9851	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-02	0.0085	0.000E+00	0.0000	0.000E+00	0.0000	8.245E-01	0.6389
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.146E-18	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.455E-04	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.582E-01	0.3551
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.901E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	4.011E-03	0.0031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.710E-03	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	3.808E-03	0.0030
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.927E-02	0.0149	0.000E+00	0.0000	0.000E+00	0.0000	1.291E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.657E-01	0.5875	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-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.543E-01	0.4010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.079E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.694E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.120E+00	0.9885	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	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.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.137E-03	0.0045	0.000E+00	0.0000	0.000E+00	0.0000	6.708E-01	0.5921
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.026E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.544E-01	0.4010
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-03	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	4.013E-03	0.0035
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.797E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	3.797E-03	0.0034
Total	0.000E+00	0.0000	0.000E-00	0.0000	0.000E+00	0.0000	1.298E-02	0.0115	0.000E+00	0.0000	0.000E+00	0.0000	1.133E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.267E-01	0.4239	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-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.435E-01	0.5755	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.190E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.516E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.702E-01	0.9995	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	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.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.021E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.269E-01	0.4242
[illegible]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-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E-00	0.0000	3.993E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.435E-01	0.5755
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-04	0.0001	0.000E-00	0.0000	0.000E+00	0.0000	1.620E-04	0.0002
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.906E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.907E-05	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.513E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	7.706E-01	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (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
Ra-226	Ra-226	1.000E+00	1.961E-01	1.959E-01	1.955E-01	1.941E-01	1.902E-01	1.771E-01	1.445E-01	7.092E-02
Ra-226	Pb-210	1.000E+00	4.869E-03	1.292E-02	2.758E-02	6.843E-02	1.283E-01	1.527E-01	1.238E-01	5.982E-02
Ra-226	∑DSR(j)		2.009E-01	2.088E-01	2.231E-01	2.625E-01	3.185E-01	3.298E-01	2.683E-01	1.307E-01
Th-228	Th-228	1.000E+00	2.499E-03	1.740E-03	8.428E-04	6.671E-05	4.752E-08	4.583E-19	0.000E+00	0.000E+00
Th-232	Th-232	1.000E+00	1.007E-02	1.007E-02	1.007E-02	1.006E-02	1.006E-02	1.003E-02	9.963E-03	9.725E-03
Th-232	Ra-228	1.000E+00	1.143E-02	3.341E-02	6.886E-02	1.349E-01	1.687E-01	1.697E-01	1.682E-01	1.642E-01
Th-232	Th-228	1.000E+00	9.825E-05	3.539E-04	9.437E-04	2.546E-03	3.551E-03	3.595E-03	3.568E-03	3.483E-03
Th-232	∑DSR(j)		2.160E-02	4.383E-02	7.987E-02	1.475E-01	1.823E-01	1.833E-01	1.818E-01	1.774E-01
U-234	U-234	1.000E+00	2.587E-03	2.542E-03	2.458E-03	2.217E-03	1.836E-03	1.602E-03	1.595E-03	1.631E-05
U-234	Th-230	1.000E+00	9.811E-09	2.741E-08	6.022E-08	1.559E-07	3.165E-07	4.349E-07	4.423E-07	4.413E-07
U-234	Ra-226	1.000E+00	1.137E-10	8.342E-10	4.403E-09	3.634E-08	2.405E-07	1.361E-06	4.446E-06	1.134E-05
U-234	Pb-210	1.000E+00	5.964E-12	3.575E-11	2.687E-10	5.218E-09	8.275E-08	9.949E-07	5.634E-06	3.669E-05
U-234	∑DSR(j)		2.587E-03	2.542E-03	2.458E-03	2.217E-03	1.836E-03	1.604E-03	1.605E-03	6.479E-05
U-238	U-238	1.000E+00	2.459E-03	2.417E-03	2.336E-03	2.107E-03	1.745E-03	1.523E-03	1.517E-03	1.555E-05
U-238	U-234	1.000E+00	3.657E-09	1.080E-08	2.438E-08	6.599E-08	1.587E-07	4.564E-07	1.359E-06	4.638E-08
U-238	Th-230	1.000E+00	1.043E-14	6.374E-14	3.025E-13	2.180E-12	1.096E-11	2.829E-11	3.360E-11	5.615E-11
U-238	Ra-226	1.000E+00	2.905E-14	8.792E-14	1.939E-13	7.878E-13	6.523E-12	6.818E-11	2.862E-10	9.258E-10
U-238	Pb-210	1.000E+00	5.557E-12	1.662E-11	3.444E-11	8.686E-11	1.746E-10	3.012E-10	1.022E-09	3.025E-08
U-238	∑DSR(j)		2.459E-03	2.417E-03	2.337E-03	2.107E-03	1.745E-03	1.523E-03	1.519E-03	1.563E-05

*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 = 2.500E+01 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
Ra-226	1.244E+02	1.197E+02	1.121E+02	9.523E+01	7.850E+01	7.581E+01	9.317E+01	1.912E+02
Th-228	1.000E+04	1.437E+04	2.966E+04	3.748E+05	5.261E+08	*8.192E+14	*8.192E+14	*8.192E+14
Th-232	1.158E+03	5.703E+02	3.130E+02	1.695E+02	1.371E+02	1.364E+02	1.375E+02	1.409E+02
U-234	9.663E+03	9.833E+03	1.017E+04	1.128E+04	1.361E+04	1.558E+04	1.557E+04	3.859E+05
U-238	1.017E+04	1.035E+04	1.070E+04	1.186E+04	1.433E+04	1.641E+04	1.646E+04	*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 = 62.6 ± 0.1 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ra-226	2.500E+00	63.5 ± 0.1	3.365E-01	7.429E+01	3.365E-01	7.429E+01
Th-228	2.500E+00	0.000E+00	2.499E-03	1.000E+04	3.536E-13	7.071E+13
Th-232	2.500E+00	50.4 ± 0.1	1.838E-01	1.360E+02	1.837E-01	1.361E+02
U-234	2.500E+00	0.000E+00	2.587E-03	9.663E+03	1.645E-03	1.520E+04
U-238	2.500E+00	0.000E+00	2.459E-03	1.017E+04	1.563E-03	1.600E+04

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	4.902E-01	4.897E-01	4.887E-01	4.852E-01	4.755E-01	4.428E-01	3.613E-01	1.773E-01
Ra-226	U-234	1.000E+00	2.843E-10	2.085E-09	1.101E-08	9.086E-08	6.014E-07	3.402E-06	1.111E-05	2.836E-05
Ra-226	U-238	1.000E+00	7.263E-14	2.198E-13	4.847E-13	1.970E-12	1.631E-11	1.705E-10	7.154E-10	2.314E-09
Ra-226	∑DOSE(j)		4.902E-01	4.897E-01	4.887E-01	4.852E-01	4.755E-01	4.428E-01	3.613E-01	1.773E-01
Pb-210	Ra-226	1.000E+00	1.217E-02	3.230E-02	6.896E-02	1.711E-01	3.207E-01	3.817E-01	3.095E-01	1.496E-01
Pb-210	U-234	1.000E-00	1.491E-11	8.938E-11	6.718E-10	1.304E-08	2.069E-07	2.487E-06	1.409E-05	9.173E-05
Pb-210	U-238	1.000E+00	1.389E-11	4.156E-11	8.611E-11	2.172E-10	4.364E-10	7.530E-10	2.554E-09	7.562E-08
Pb-210	∑DOSE(j)		1.217E-02	3.230E-02	6.896E-02	1.711E-01	3.207E-01	3.817E-01	3.095E-01	1.497E-01
Th-228	Th-228	1.000E+00	6.249E-03	4.349E-03	2.107E-03	1.668E-04	1.188E-07	1.146E-18	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	2.456E-04	8.848E-04	2.359E-03	6.364E-03	8.878E-03	8.986E-03	8.920E-03	8.706E-03
Th-228	∑DOSE(j)		6.494E-03	5.234E-03	4.466E-03	6.531E-03	8.878E-03	8.986E-03	8.920E-03	8.706E-03
Th-232	Th-232	1.000E+00	2.517E-02	2.517E-02	2.516E-02	2.516E-02	2.514E-02	2.508E-02	2.491E-02	2.431E-02
Ra-228	Th-232	1.000E+00	2.858E-02	8.354E-02	1.721E-01	3.372E-01	4.217E-01	4.242E-01	4.206E-01	4.105E-01
U-234	U-234	1.000E+00	6.468E-03	6.356E-03	6.145E-03	5.543E-03	4.589E-03	4.004E-03	3.987E-03	4.078E-05
U-234	U-238	1.000E+00	9.142E-09	2.700E-08	6.095E-08	1.650E-07	3.968E-07	1.141E-06	3.398E-06	1.160E-07
U-234	∑DOSE(j)		6.468E-03	6.356E-03	6.145E-03	5.543E-03	4.590E-03	4.005E-03	3.991E-03	4.089E-05
Th-230	U-234	1.000E+00	2.453E-08	6.852E-08	1.506E-07	3.898E-07	7.913E-07	1.087E-06	1.106E-06	1.103E-06
Th-230	U-238	1.000E+00	2.607E-14	1.593E-13	7.562E-13	5.451E-12	2.740E-11	7.073E-11	8.399E-11	1.404E-10
Th-230	∑DOSE(j)		2.453E-08	6.852E-08	1.506E-07	3.898E-07	7.913E-07	1.087E-06	1.106E-06	1.103E-06
U-238	U-238	1.000E+00	6.148E-03	6.041E-03	5.841E-03	5.269E-03	4.363E-03	3.807E-03	3.793E-03	3.887E-05

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	2.500E+00	2.497E+00	2.492E+00	2.475E+00	2.425E+00	2.258E+00	1.843E+00	9.042E-01
Ra-226	U-234	1.000E+00	0.000E+00	4.807E-09	4.207E-08	4.253E-07	2.988E-06	1.723E-05	5.641E-05	1.426E-04
Ra-226	U-238	1.000E+00	0.000E+00	4.511E-15	1.169E-13	3.753E-12	6.896E-11	8.444E-10	3.574E-09	9.660E-09
Ra-226	ΣS(j):		2.500E+00	2.497E+00	2.492E+00	2.475E+00	2.425E+00	2.258E+00	1.843E+00	9.044E-01
Pb-210	Ra-226	1.000E+00	0.000E+00	7.569E-02	2.156E-01	6.033E-01	1.161E+00	1.375E+00	1.129E+00	5.540E-01
Pb-210	U-234	1.000E+00	0.000E+00	4.934E-11	1.271E-09	4.014E-08	7.067E-07	7.924E-06	3.179E-05	8.469E-05
Pb-210	U-238	1.000E+00	0.000E+00	3.484E-17	2.674E-15	2.742E-13	1.336E-11	3.605E-10	2.000E-09	5.733E-09
Pb-210	ΣS(j):		0.000E+00	7.569E-02	2.156E-01	6.033E-01	1.161E+00	1.375E+00	1.129E+00	5.541E-01
Th-228	Th-228	1.000E+00	2.500E+00	1.740E+00	8.430E-01	6.672E-02	4.753E-05	4.584E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	4.615E-02	3.016E-01	1.281E+00	1.969E+00	2.002E+00	1.988E+00	1.941E+00
Th-228	ΣS(j):		2.500E+00	1.786E+00	1.145E+00	1.348E+00	1.969E+00	2.002E+00	1.988E+00	1.941E+00
Th-232	Th-232	1.000E+00	2.500E+00	2.500E+00	2.500E+00	2.499E+00	2.497E+00	2.491E+00	2.474E+00	2.415E+00
Ra-228	Th-232	1.000E+00	0.000E+00	2.798E-01	7.280E-01	1.560E-00	1.985E+00	2.002E+00	1.988E+00	1.941E+00
U-234	U-234	1.000E+00	2.500E+00	2.399E+00	2.209E+00	1.655E+00	7.250E-01	4.035E-02	1.051E-05	3.002E-18
U-234	U-238	1.000E+00	0.000E+00	6.801E-06	1.879E-05	4.691E-05	6.166E-05	1.144E-05	8.946E-09	8.523E-21
U-234	ΣS(j):		2.500E+00	2.399E+00	2.209E+00	1.655E+00	7.250E-01	4.037E-02	1.052E-05	3.011E-18
Th-230	U-234	1.000E+00	0.000E+00	2.205E-05	6.350E-05	1.844E-04	3.869E-04	5.348E-04	5.389E-04	5.227E-04
Th-230	U-238	1.000E+00	0.000E+00	3.104E-11	2.645E-10	2.434E-09	1.315E-08	3.428E-08	3.706E-08	3.595E-08
Th-230	ΣS(j):		0.000E+00	2.205E-05	6.350E-05	1.844E-04	3.869E-04	5.348E-04	5.389E-04	5.228E-04
U-238	U-238	1.000E+00	2.500E+00	2.399E+00	2.209E+00	1.655E+00	7.250E-01	4.037E-02	1.052E-05	3.011E-18

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

RESCALC.EXE execution time = 144.42 seconds

RESRAD SUMMARY REPORT

3.5–ACRE AREA

4–FOOT COVER

SIMULATION 2

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Total Dose Components
Time = 0.000E+00 10
Time = 1.000E+00 11
Time = 3.000E+00 12
Time = 1.000E+01 13
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Dose Conversion Factor (and Related) Parameter Summary
File: FGR 13 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	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:			
	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
	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)
	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

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

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)
	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
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

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.416E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.190E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-226	2.500E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Th-228	2.500E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Th-232	2.500E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-234	2.500E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	2.500E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(4)
	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(6)
	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)	1.220E+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)	1.000E-04	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.130E+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)	1.016E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+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
	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	3.548E+03	7.000E+01	---	DCNUCC(2)
R016	Saturated zone (cm**3/g)	3.548E+03	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.837E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.452E-05	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Th-232				
	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(6)
	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.452E-05	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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.126E-02	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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.126E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(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	2.067E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
	Leach rate (/yr)	0.000E+00	0.000E+00	2.951E-02	ALEACH(3)
	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.452E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R017	Inhalation rate (m**3/yr)	not used	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	not used	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	not used	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	not used	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	not used	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	not used	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	not used	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)
	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
	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)	4.150E+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)
	Soil ingestion rate (g/yr)	not used	3.650E+01	---	SOIL
	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	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	1.000E+00	1.000E+00	---	FGWIR
	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
	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)
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
	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions	
Area:	14164.00 square meters
Thickness:	0.15 meters
Cover Depth:	1.22 meters

Initial Soil Concentrations, pCi/g	
Ra-226	2.500E+00
Th-228	2.500E+00
Th-232	2.500E+00
U-234	2.500E+00
U-238	2.500E+00

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.463E-04	4.852E-04	1.269E-03	4.419E-03	1.192E-02	1.927E-02	1.298E-02	3.513E-04
M(t):	5.851E-06	1.941E-05	5.076E-05	1.768E-04	4.767E-04	7.710E-04	5.190E-04	1.405E-05

Maximum TDOSE(t): 1.928E-02 mrem/yr at t = 97.5 ± 0.2 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 = 9.748E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
ide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 9.748E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.091E-02	0.5661	0.000E+00	0.0000	0.000E+00	0.0000	1.091E-02	0.5661
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-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.712E-04	0.0400	0.000E+00	0.0000	0.000E+00	0.0000	7.712E-04	0.0400
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.892E-03	0.2019	0.000E+00	0.0000	0.000E+00	0.0000	3.892E-03	0.2019
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.702E-03	0.1920	0.000E+00	0.0000	0.000E+00	0.0000	3.702E-03	0.1920
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.928E-02	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.928E-02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.484E-06	0.0238	0.000E+00	0.0000	0.000E+00	0.0000	3.484E-06	0.0238
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.759E-06	0.0394	0.000E+00	0.0000	0.000E+00	0.0000	5.759E-06	0.0394
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.025E-05	0.4803	0.000E+00	0.0000	0.000E+00	0.0000	7.025E-05	0.4803
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.678E-05	0.4565	0.000E+00	0.0000	0.000E+00	0.0000	6.678E-05	0.4565
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-04	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-05	0.0524	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-05	0.0524
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.962E-05	0.0817	0.000E+00	0.0000	0.000E+00	0.0000	3.962E-05	0.0817
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.154E-04	0.4440	0.000E+00	0.0000	0.000E+00	0.0000	2.154E-04	0.4440
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.047E-04	0.4220	0.000E+00	0.0000	0.000E+00	0.0000	2.047E-04	0.4220
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.852E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.852E-04	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-04	0.1031	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-04	0.1031
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-04	0.1420	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-04	0.1420
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.912E-04	0.3870	0.000E+00	0.0000	0.000E+00	0.0000	4.912E-04	0.3870
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.669E-04	0.3679	0.000E+00	0.0000	0.000E+00	0.0000	4.669E-04	0.3679
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-03	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-03	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.808E-04	0.2220	0.000E+00	0.0000	0.000E+00	0.0000	9.808E-04	0.2220
[illegible]28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.884E-04	0.2010	0.000E+00	0.0000	0.000E+00	0.0000	8.884E-04	0.2010
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-03	0.2958	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-03	0.2958
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-03	0.2812	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-03	0.2812
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.419E-03	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.419E-03	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.907E-03	0.4118	0.000E+00	0.0000	0.000E+00	0.0000	4.907E-03	0.4118
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.678E-03	0.1408	0.000E+00	0.0000	0.000E+00	0.0000	1.678E-03	0.1408
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.734E-03	0.2294	0.000E+00	0.0000	0.000E+00	0.0000	2.734E-03	0.2294
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.599E-03	0.2181	0.000E+00	0.0000	0.000E+00	0.0000	2.599E-03	0.2181
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.192E-02	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.192E-02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-02	0.5664	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-02	0.5664
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.455E-04	0.0387	0.000E+00	0.0000	0.000E+00	0.0000	7.455E-04	0.0387
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.901E-03	0.2024	0.000E+00	0.0000	0.000E+00	0.0000	3.901E-03	0.2024
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.710E-03	0.1925	0.000E+00	0.0000	0.000E+00	0.0000	3.710E-03	0.1925
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.927E-02	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.927E-02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	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.
26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.137E-03	0.3959	0.000E+00	0.0000	0.000E+00	0.0000	5.137E-03	0.3959
28	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.026E-05	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	5.026E-05	0.0039
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-03	0.3077	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-03	0.3077
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.797E-03	0.2926	0.000E+00	0.0000	0.000E+00	0.0000	3.797E-03	0.2926
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E-02	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E-02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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	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-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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	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.
[illegible]26	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.021E-04	0.5754	0.000E+00	0.0000	0.000E+00	0.0000	2.021E-04	0.5754
[illegible]8	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-09	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-04	0.3134	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-04	0.3134
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.906E-05	0.1112	0.000E+00	0.0000	0.000E+00	0.0000	3.906E-05	0.1112
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.513E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.513E-04	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
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	1.394E-06	1.016E-05	5.234E-05	3.923E-04	1.963E-03	4.367E-03	2.055E-03	8.085E-05
Ra-226	∑DSR(j)		1.394E-06	1.016E-05	5.234E-05	3.923E-04	1.963E-03	4.367E-03	2.055E-03	8.085E-05
Th-228	Th-228	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-232	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-232	Ra-228	1.000E+00	2.289E-06	1.574E-05	7.158E-05	3.529E-04	6.663E-04	2.960E-04	1.996E-05	1.586E-09
Th-232	Th-228	1.000E+00	1.473E-08	1.040E-07	4.828E-07	2.466E-06	4.785E-06	2.134E-06	1.440E-07	1.144E-11
Th-232	∑DSR(j)		2.304E-06	1.585E-05	7.206E-05	3.554E-04	6.711E-04	2.982E-04	2.010E-05	1.597E-09
U-234	U-234	1.000E+00	2.810E-05	8.616E-05	1.965E-04	5.228E-04	1.093E-03	1.560E-03	1.595E-03	1.631E-05
U-234	Th-230	1.000E+00	1.546E-11	4.943E-11	1.157E-10	3.351E-10	8.848E-10	2.483E-09	6.767E-09	1.878E-08
U-234	Ra-226	1.000E+00	2.206E-14	6.972E-14	2.125E-13	2.504E-12	4.909E-11	1.092E-09	1.310E-08	1.482E-07
U-234	Pb-210	1.000E+00	4.125E-12	1.240E-11	3.036E-11	1.113E-10	2.746E-09	1.316E-07	2.197E-06	2.755E-05
U-234	∑DSR(j)		2.810E-05	8.616E-05	1.965E-04	5.228E-04	1.093E-03	1.560E-03	1.597E-03	4.403E-05
U-238	U-238	1.000E+00	2.671E-05	8.190E-05	1.867E-04	4.970E-04	1.039E-03	1.484E-03	1.517E-03	1.555E-05
U-238	U-234	1.000E+00	5.357E-11	3.802E-10	1.963E-09	1.558E-08	9.456E-08	4.446E-07	1.359E-06	4.638E-08
U-238	Th-230	1.000E+00	7.141E-16	2.276E-15	5.414E-15	1.989E-14	8.538E-14	5.344E-13	3.639E-12	2.709E-11
U-238	Ra-226	1.000E+00	2.898E-14	8.669E-14	1.796E-13	4.528E-13	9.034E-13	1.414E-12	5.223E-12	1.676E-10
U-238	Pb-210	1.000E+00	5.557E-12	1.662E-11	3.444E-11	8.682E-11	1.730E-10	2.618E-10	8.054E-10	2.963E-08
U-238	∑DSR(j)		2.671E-05	8.190E-05	1.867E-04	4.970E-04	1.040E-03	1.484E-03	1.519E-03	1.562E-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 ≤ 0.5 yr) daughters.

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

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	1.794E+07	2.460E+06	4.777E+05	6.372E+04	1.274E+04	5.725E+03	1.217E+04	3.092E+05
Th-228	*8.192E+14	*8.192E+14	*8.192E+14	*8.192E+14	*8.192E+14	*8.192E+14	*8.192E+14	*8.192E+14
Th-232	*1.096E+05	*1.096E+05	*1.096E+05	7.035E+04	3.725E+04	8.384E+04	*1.096E+05	*1.096E+05
U-234	8.896E+05	2.902E+05	1.272E+05	4.782E+04	2.286E+04	1.602E+04	1.565E+04	5.678E+05
U-238	*3.360E+05	3.053E+05	1.339E+05	5.030E+04	2.405E+04	1.685E+04	1.646E+04	*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 = 97.5 ± 0.2 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ra-226	2.500E+00	99.8 ± 0.2	4.367E-03	5.725E+03	4.366E-03	5.727E+03
Th-228	2.500E+00	0.000E+00	0.000E+00	*8.192E+14	0.000E+00	*8.192E+14
Th-232	2.500E+00	29.73 ± 0.06	6.711E-04	3.725E+04	3.085E-04	8.104E+04
U-234	2.500E+00	797 ± 2	1.645E-03	1.520E+04	1.557E-03	1.606E+04
U-238	2.500E+00	797 ± 2	1.554E-03	1.609E+04	1.481E-03	1.688E+04

*At specific activity limit

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	U-234	1.000E+00	5.516E-14	1.743E-13	5.312E-13	6.260E-12	1.227E-10	2.729E-09	3.276E-08	3.704E-07
Ra-226	U-238	1.000E+00	7.244E-14	2.167E-13	4.490E-13	1.132E-12	2.258E-12	3.535E-12	1.306E-11	4.189E-10
Ra-226	∑DOSE(j)		1.276E-13	3.910E-13	9.802E-13	7.392E-12	1.250E-10	2.733E-09	3.277E-08	3.708E-07
Pb-210	Ra-226	1.000E+00	3.484E-06	2.540E-05	1.308E-04	9.808E-04	4.907E-03	1.092E-02	5.137E-03	2.021E-04
Pb-210	U-234	1.000E+00	1.031E-11	3.100E-11	7.590E-11	2.783E-10	6.866E-09	3.290E-07	5.492E-06	6.887E-05
Pb-210	U-238	1.000E+00	1.389E-11	4.156E-11	8.610E-11	2.171E-10	4.325E-10	6.544E-10	2.013E-09	7.407E-08
Pb-210	∑DOSE(j)		3.484E-06	2.540E-05	1.308E-04	9.808E-04	4.907E-03	1.092E-02	5.142E-03	2.711E-04
Th-228	Th-228	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	3.683E-08	2.600E-07	1.207E-06	6.165E-06	1.196E-05	5.335E-06	3.600E-07	2.860E-11
Th-228	∑DOSE(j)		3.683E-08	2.600E-07	1.207E-06	6.165E-06	1.196E-05	5.335E-06	3.600E-07	2.860E-11
Th-232	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-228	Th-232	1.000E+00	5.722E-06	3.936E-05	1.789E-04	8.822E-04	1.666E-03	7.401E-04	4.990E-05	3.964E-09
U-234	U-234	1.000E+00	7.025E-05	2.154E-04	4.912E-04	1.307E-03	2.734E-03	3.901E-03	3.987E-03	4.078E-05
U-234	U-238	1.000E+00	1.339E-10	9.506E-10	4.907E-09	3.894E-08	2.364E-07	1.112E-06	3.398E-06	1.160E-07
U-234	∑DOSE(j)		7.025E-05	2.154E-04	4.912E-04	1.307E-03	2.734E-03	3.902E-03	3.991E-03	4.089E-05
Th-230	U-234	1.000E+00	3.864E-11	1.236E-10	2.893E-10	8.377E-10	2.212E-09	6.207E-09	1.692E-08	4.694E-08
Th-230	U-238	1.000E+00	1.785E-15	5.689E-15	1.354E-14	4.973E-14	2.135E-13	1.336E-12	9.098E-12	6.772E-11
Th-230	∑DOSE(j)		3.864E-11	1.236E-10	2.893E-10	8.377E-10	2.212E-09	6.209E-09	1.693E-08	4.701E-08
U-238	U-238	1.000E+00	6.678E-05	2.047E-04	4.669E-04	1.242E-03	2.599E-03	3.709E-03	3.793E-03	3.887E-05

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

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+0C	2.500E+00	2.497E+00	2.492E+00	2.475E+00	2.425E+00	2.258E+00	1.843E+00	9.042E-01
Ra-226	U-234	1.000E+00	0.000E+00	4.807E-09	4.207E-08	4.253E-07	2.988E-06	1.723E-05	5.641E-05	1.426E-04
Ra-226	U-238	1.000E+00	0.000E+00	4.511E-15	1.169E-13	3.753E-12	6.896E-11	8.444E-10	3.574E-09	9.660E-09
Ra-226	∑S(j):		2.500E+00	2.497E+00	2.492E+00	2.475E+00	2.425E+00	2.258E+00	1.843E+00	9.044E-01
Pb-210	Ra-226	1.000E+00	0.000E+00	7.569E-02	2.156E-01	6.033E-01	1.161E+00	1.375E+00	1.129E+00	5.540E-01
Pb-210	U-234	1.000E+00	0.000E+00	4.934E-11	1.271E-09	4.014E-08	7.067E-07	7.924E-06	3.179E-05	8.469E-05
Pb-210	U-238	1.000E+00	0.000E+00	3.484E-17	2.674E-15	2.742E-13	1.336E-11	3.605E-10	2.000E-09	5.733E-09
Pb-210	∑S(j):		0.000E+00	7.569E-02	2.156E-01	6.033E-01	1.161E+00	1.375E+00	1.129E+00	5.541E-01
Th-228	Th-228	1.000E+00	2.500E+00	1.740E+00	8.430E-01	6.672E-02	4.753E-05	4.584E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	4.615E-02	3.016E-01	1.281E+00	1.969E+00	2.002E+00	1.988E+00	1.941E+00
Th-228	∑S(j):		2.500E+00	1.786E+00	1.145E+00	1.348E+00	1.969E+00	2.002E+00	1.988E+00	1.941E+00
Th-232	Th-232	1.000E+00	2.500E+00	2.500E+00	2.500E+00	2.499E+00	2.497E+00	2.491E+00	2.474E+00	2.415E+00
Ra-228	Th-232	1.000E+00	0.000E+00	2.798E-01	7.280E-01	1.560E+00	1.985E+00	2.002E+00	1.988E+00	1.941E+00
U-234	U-234	1.000E+00	2.500E+00	2.399E+00	2.209E+00	1.655E+00	7.250E-01	4.035E-02	1.051E-05	3.002E-18
U-234	U-238	1.000E+00	0.000E+00	6.801E-06	1.879E-05	4.691E-05	6.166E-05	1.144E-05	8.946E-09	8.523E-21
U-234	∑S(j):		2.500E+00	2.399E+00	2.209E+00	1.655E+00	7.250E-01	4.037E-02	1.052E-05	3.011E-18
Th-230	U-234	1.000E+00	0.000E+00	2.205E-05	6.350E-05	1.844E-04	3.869E-04	5.348E-04	5.389E-04	5.227E-04
Th-230	U-238	1.000E+00	0.000E+00	3.104E-11	2.645E-10	2.434E-09	1.315E-08	3.428E-08	3.706E-08	3.595E-08
Th-230	∑S(j):		0.000E+00	2.205E-05	6.350E-05	1.844E-04	3.869E-04	5.348E-04	5.389E-04	5.228E-04
U-238	U-238	1.000E+00	2.500E+00	2.399E+00	2.209E+00	1.655E+00	7.250E-01	4.037E-02	1.052E-05	3.011E-18

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

RESCALC.EXE execution time = 54.54 seconds

ATTACHMENT D

SENSITIVITY ANALYSIS

SENSITIVITY ANALYSIS

2.6–ACRE AREA

NO COVER

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

Scenario Res. Gardener **Sensitivity Analysis for 2.6 Acre Model with No Cover**

Applicable Pathways	
External Gamma	X
Inhalation	X
Plant Ingestion	X
Meat Ingestion	
Milk Ingestion	
Aquatic Foods	
Drinking Water	
Soil Ingestion	X
Radon	
Find Peak Pathway Doses	X

Total Parameters:	157
Sensitivity analysis performed on:	54

Max Dose		# of Parameters above:	
		>1% Increase	12
5.1	2.73	>5% Increase	4
		>10% Increase	3

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Contaminated Zone	Area of contaminated zone (m^2)	1.000E+04	1.052E+04	AREA	1.052E+04	NA				
	Thickness of contaminated zone (meters)	2.000E+00	3.000E+00	THICK0	3.000E+00	NA				
	Length parallel to aquifer flow (m)	1.000E+02	1.030E+02	LCZPAQ	1.030E+02	2	2.713	2.713	No Change	0.00%
Soil Concentrations	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	BRDL	2.500E+01	NA				
	Time since placement of material (yr)	0.000E+00		TI	0.000E+00	NA				
Calculation Times	Times for calculations (yr)	1.000E+00	1.000E+00	T(2)	1.000E+00	NA				
	Times for calculations (yr)	3.000E+00	3.000E+00	T(3)	3.000E+00	NA				

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RESRAD Parameter Information
2.6 Acre Site

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Times for calculations (yr)	1.000E+01	1.000E+01	T(4)	1.000E+01	NA				
	Times for calculations (yr)	3.000E+01	3.000E+01	T(5)	3.000E+01	NA				
	Times for calculations (yr)	1.000E+02	1.000E+02	T(6)	1.000E+02	NA				
	Times for calculations (yr)	3.000E+02	3.000E+02	T(7)	3.000E+02	NA				
	Times for calculations (yr)	1.000E+03	1.000E+03	T(8)	1.000E+03	NA				
Soil Concentrations	Initial principal radionuclides (pCi/g): Ra-226	0.000E+00	3.600E-01	S1(4)	3.600E-01	NA				
	Initial principal radionuclides (pCi/g): Th-228	0.000E+00	0.000E+00	S1(7)	0.000E+00	NA				
	Initial principal radionuclides (pCi/g): Th-232	0.000E+00	0.000E+00	S1(8)	0.000E+00	NA				
	Initial principal radionuclides (pCi/g): U-234	0.000E+00	6.800E-01	S1(10)	6.800E-01	NA				
	Initial principal radionuclides (pCi/g): U-238	0.000E+00	6.800E-01	S1(11)	6.800E-01	NA				
Cover/Hydrology	Cover depth (m)	0.000E+00	0.000E+00	COVER0	0.000E+00	NA				
	Density of cover material (g/cm^3)	1.500E+00	1.630E+00	DENSCV	1.630E+00	NA				
	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-04	VCV	1.000E-04	NA				
	Density of contaminated zone (g/cm^3)	1.500E+00	1.630E+00	DENSCZ	1.630E+00	1.5	2.75	2.6	Factor Increase	1.36%
	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-04	VCZ	1.000E-04	2	2.713	2.713	No Change	0.00%
	Contaminated zone total porosity	4.000E-01	4.000E-01	TPCZ	4.000E-01	2	2.713	2.713	No Change	0.00%
	Contaminated zone field capacity	2.000E-01	2.000E-01	FCCZ	2.000E-01	2	2.713	2.713	No Change	0.00%

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	HCCZ	1.000E+01	2	2.713	2.713	No Change	0.00%
	Contaminated zone b parameter	5.300E+00	5.300E+00	BCZ	5.300E+00	2	2.713	2.713	No Change	0.00%
	Average annual wind speed (m/sec)	2.000E+00	3.130E+00	WIND	3.130E+00	1.5	2.713	2.713	No Change	0.00%
	Humidity in air (g/cm^3)	8.000E+00	not used	HUMID	not used	NA				
	Evapotranspiration coefficient	5.000E-01	5.000E-01	EVAPTR	5.000E-01	1.5	2.75	2.6	Factor Increase	1.36%
	Precipitation (m/yr)	1.000E+00	1.016E+00	PRECIP	1.016E+00	1.5	2.75	2.6	Factor Increase	1.36%
	Irrigation (m/yr)	2.000E-01	2.000E-01	RI	2.000E-01	1.5	2.713	2.713	No Change	0.00%
	Irrigation mode	overhead	overhead	IDITCH	overhead	NA				
	Runoff coefficient	2.000E-01	2.000E-01	RUNOFF	2.000E-01	1.5	2.72	2.713	Factor Increase	0.26%
	Watershed area for nearby stream or pond (m^2)	1.000E+06	1.000E+06	WAREA	1.000E+06	2	2.713	2.713	No Change	0.00%
	Accuracy for water/soil computations	1.000E-03	1.000E-03	EPS	1.000E-03	NA				

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (Increase in dose)	% by which Dose is Increased
Saturated Zone	Density of saturated zone (g/cm^3)	1.500E+00	1.630E+00	DENSAQ	1.630E+00	1.5	2.713	2.713	No Change	0.00%
	Saturated zone total porosity	4.000E-01	4.000E-01	TPSZ	4.000E-01	2	2.73	2.713	Factor Increase	0.63%
	Saturated zone effective porosity	2.000E-01	2.000E-01	EPSZ	2.000E-01	2	2.73	2.713	Factor Increase	0.63%
	Saturated zone field capacity	2.000E-01	2.000E-01	FCSZ	2.000E-01	2	2.713	2.713	No Change	0.00%
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	HCSZ	1.000E+02	2	2.713	2.713	No Change	0.00%
	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	HGWT	2.000E-02	2	2.713	2.713	No Change	0.00%
	Saturated zone b parameter	5.300E+00	5.300E+00	BSZ	5.300E+00	2	2.713	2.713	No Change	0.00%
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	VWT	1.000E-03	3	2.713	2.713	No Change	0.00%
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	DWIBWT	1.000E+01	3	2.73	2.713	Factor Increase	0.63%
	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	MODEL	ND	NA				
	Well pumping rate (m^3/yr)	2.500E+02	2.500E+02	UW	2.500E+02	2	2.713	2.713	No Change	0.00%

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RESRAD Parameter Information
2.6 Acre Site

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Unsaturated	Number of unsaturated zone strata	1	0.000E+00	NS	0.000E+00	NA				
	Unsat. zone 1, thickness (m)	4.000E+00	not used	H(1)	not used	NA				
	Unsat. zone 1, soil density (g/cm^3)	1.500E+00	not used	DENSUZ(1)	not used	NA				
	Unsat. zone 1, total porosity	4.000E-01	not used	TPUZ(1)	not used	NA				
	Unsat. zone 1, effective porosity	2.000E-01	not used	EPUZ(1)	not used	NA				
	Unsat. zone 1, field capacity	2.000E-01	not used	FCUZ(1)	not used	NA				
	Unsat. zone 1, soil-specific b parameter	5.300E+00	not used	BUZ(1)	not used	NA				
	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	not used	HCUZ(1)	not used	NA				
Soil Concentrations - Transport	Distribution coefficients for Ra-226									
	Contaminated zone (cm^3/g)	7.000E+01	7.000E+01	DCNUCC( )	7.000E+01	50	2.8	2.3	Factor Increase	3.21%
	Unsaturated zone (cm^3/g)	7.000E+01	7.000E+01	DCNUCC( )	7.000E+01	NA				
	Saturated zone (cm^3/g)	7.000E+01	7.000E+01	DCNUCU( )	7.000E+01	50	2.75	2.713	Factor Increase	1.36%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				

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RESRAD Parameter Information
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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Distribution coefficients for Th-228									
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	NA				
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for Th-232									
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	NA				
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-234									
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	2.713	2.713	No Change	0.00%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	2.713	2.73	Factor Decrease	0.63%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-238									

MolyCorp York
RESRAD Parameter Information
2.6 Acre Site

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	2.713	2.7	Factor Increase	0.00%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	2.713	2.72	Factor Decrease	0.26%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
Occupancy	Inhalation rate (m^3/yr)	8.400E+03	1.226E+04	INHALR	1.226E+04	1.5	2.713	2.713	No Change	0.00%
	Mass loading for inhalation (g/m^3)	1.000E-04	1.000E-04	MLINH	1.000E-04	5	2.75	2.7	Factor Increase	1.36%
	Exposure duration (year)	3.000E+01	2.500E+01	ED	2.500E+01	NA				
	Shielding factor, inhalation	4.000E-01	5.000E-01	SHF3	5.000E-01	1.5	2.713	2.713	No Change	0.00%
	Shielding factor, external gamma	7.000E-01	5.512E-01	SHF1	5.512E-01	1.5	3.25	2.3	Factor Increase	19.79%
	Fraction of time spent indoors	5.000E-01	5.500E-01	FIND	5.500E-01	1.5	2.9	2.5	Factor Increase	6.89%

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Fraction of time spent outdoors (on site)	2.500E-01	2.100E-01	FOTD	2.100E-01	1.5	3.1	2.4	Factor Increase	14.26%
	Shape factor flag, external gamma	1.000E+00	1.000E+00	FS	1.000E+00	NA				
Ingestion, Dietary	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	4.150E+01	DIET(1)	4.150E+01	4	5.1	2.1	Factor Increase	87.98%
	Leafy vegetable consumption (kg/yr)	1.400E+01	2.750E+00	DIET(2)	2.750E+00	4	2.8	2.7	Factor Increase	3.21%
	Milk consumption (L/yr)	9.200E+01	not used	DIET(3)	not used	NA				
	Meat and poultry consumption (kg/yr)	6.300E+01	not used	DIET(4)	not used	NA				
	Fish consumption (kg/yr)	5.400E+00	not used	DIET(5)	not used	NA				
	Other seafood consumption (kg/yr)	9.000E-01	not used	DIET(6)	not used	NA				
	Soil ingestion rate (g/yr)	3.650E+01	1.825E+01	SOIL	1.825E+01	2	2.75	2.7	Factor Increase	1.36%
	Drinking water intake (L/yr)	5.100E+02	not used	DWI	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contamination fraction of drinking water	1.000E+00	not used	FDW	not used	NA				
	Contamination fraction of household water	1.000E+00	not used	FHHW	not used	NA				
	Contamination fraction of livestock water	1.000E+00	not used	FLW	not used	NA				
	Contamination fraction of irrigation water	1.000E+00	1.000E+00	FIRW	1.000E+00	NA				
	Contamination fraction of aquatic food	5.000E-01	not used	FR9	not used	NA				
	Contamination fraction of plant food	-1.000E+00	-1.000E+00	FPLANT	-1.000E+00	NA				
	Contamination fraction of meat	-1.000E+00	not used	FMEAT	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contamination fraction of milk	-1.000E+00	not used	FMILK	not used	NA				
Ingestion, Non-Dietary	Livestock fodder intake for meat (kg/day)	6.800E+01	not used	LFI5	not used	NA				
	Livestock fodder intake for milk (kg/day)	5.500E+01	not used	LFI6	not used	NA				
	Livestock water intake for meat (L/day)	5.000E+01	not used	LWI5	not used	NA				
	Livestock water intake for milk (L/day)	1.600E+02	not used	LWI6	not used	NA				
	Livestock soil intake (kg/day)	5.000E-01	not used	LSI	not used	NA				
	Mass loading for foliar deposition (g/m^3)	1.000E-04	1.000E-04	MLFD	1.000E-04	2	2.713	2.713	No Change	0.00%
	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	DM	1.500E-01	2	2.713	2.713	No Change	0.00%
	Depth of roots (m)	9.000E-01	9.000E-01	DROOT	9.000E-01	2	2.713	2.713	No Change	0.00%
	Drinking water fraction from ground water	1.000E+00	not used	FGWDW	not used	NA				
	Household water fraction from ground water	1.000E+00	not used	FGWHH	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Livestock water fraction from ground water	1.000E+00	not used	FGWLW	not used	NA				
	Irrigation fraction from ground water	1.000E+00	1.000E+00	FGWIR	1.000E+00	NA				
Ingestion, Non-Dietary - Plant Factors	Wet weight crop yield for Non-Leafy (kg/m^2)	7.000E-01	7.000E-01	YV(1)	7.000E-01	2	2.713	2.713	No Change	0.00%
	Wet weight crop yield for Leafy (kg/m^2)	1.500E+00	1.500E+00	YV(2)	1.500E+00	2	2.713	2.713	No Change	0.00%
	Wet weight crop yield for Fodder (kg/m^2)	1.100E+00	not used	YV(3)	not used	NA				
	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	TE(1)	1.700E-01	2	2.713	2.713	No Change	0.00%
	Growing Season for Leafy (years)	2.500E-01	2.500E-01	TE(2)	2.500E-01		2.713	2.713	No Change	0.00%
	Growing Season for Fodder (years)	8.000E-02	not used	TE(3)	not used	NA				
	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	TIV(1)	1.000E-01	2	2.713	2.713	No Change	0.00%
	Translocation Factor for Leafy	1.000E+00	1.000E+00	TIV(2)	1.000E+00	NA				
	Translocation Factor for Fodder	1.000E+00	not used	TIV(3)	not used	NA				
	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RDRY(1)	2.500E-01	2	2.713	2.713	No Change	0.00%
	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RDRY(2)	2.500E-01	2	2.713	2.713	No Change	0.00%

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (Increase in dose)	% by which Dose is Increased
	Dry Foliar Interception Fraction for Fodder	2.500E-01	not used	RDRY(3)	not used	NA				
	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RWET(1)	2.500E-01	2	2.713	2.713	No Change	0.00%
	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RWET(2)	2.500E-01	2	2.713	2.713	No Change	0.00%
	Wet Foliar Interception Fraction for Fodder	2.500E-01	not used	RWET(3)	not used	NA				
	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	WLAM	2.000E+01	2	2.713	2.713	No Change	0.00%
Storage Times	Storage times of contaminated foodstuffs (days):									
	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	STOR_T(1)	1.400E+01	2	2.713	2.713	No Change	0.00%
	Leafy vegetables	1.000E+00	1.000E+00	STOR_T(2)	1.000E+00	5	2.713	2.713	No Change	0.00%
	Milk	1.000E+00	1.000E+00	STOR_T(3)	1.000E+00	NA				
	Meat and poultry	2.000E+01	2.000E+01	STOR_T(4)	2.000E+01	NA				
	Fish	7.000E+00	7.000E+00	STOR_T(5)	7.000E+00	NA				
	Crustacea and mollusks	7.000E+00	7.000E+00	STOR_T(6)	7.000E+00	NA				
	Well water	1.000E+00	1.000E+00	STOR_T(7)	1.000E+00	5	2.713	2.713	No Change	0.00%
	Surface water	1.000E+00	1.000E+00	STOR_T(8)	1.000E+00	5	2.713	2.713	No Change	0.00%
	Livestock fodder	4.500E+01	4.500E+01	STOR_T(9)	4.500E+01	NA				

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Radon	Thickness of building foundation (m)	1.500E-01	not used	FLOOR	not used	NA				
	Bulk density of building foundation (g/cm^3)	2.400E+00	not used	DENSFL	not used	NA				
	Total porosity of the cover material	4.000E-01	not used	TPCV	not used	NA				
	Total porosity of the building foundation	1.000E-01	not used	TPFL	not used	NA				
	Volumetric water content of the cover material	5.000E-02	not used	PH2OCV	not used	NA				
	Volumetric water content of the foundation	3.000E-02	not used	PH2OFL	not used	NA				
	Diffusion coefficient for radon gas (m/sec):		not used		not used	NA				
	in cover material	2.000E-06	not used	DIFCV	not used	NA				
	in foundation material	3.000E-07	not used	DIFFL	not used	NA				
	in contaminated zone soil	2.000E-06	not used	DIFCZ	not used	NA				
	Radon vertical dimension of mixing (m)	2.000E+00	not used	HMIX	not used	NA				
	Average building air exchange rate (1/hr)	5.000E-01	not used	REXG	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre No Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Height of the building (room) (m)	2.500E+00	not used	HRM	not used	NA				
	Building interior area factor	0.000E+00	not used	FAI	not used	NA				
	Building depth below ground surface (m)	-1.000E+00	not used	DMFL	not used	NA				
	Emanating power of Rn-222 gas	2.500E-01	not used	EMANA(1)	not used	NA				
	Emanating power of Rn-220 gas	1.500E-01	not used	EMANA(2)	not used	NA				

R1 = User's Manual for RESRAD Version 6.0, July 2001
R2 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume I, June 1994
R3 = Data Collection Handbook to Support Modeling Impacts of Radioactive Material In Soil, Argonne National Laboratory, April 1993
R4 = Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning, Handout, Nuclear Regulatory Commission Workshop, March 18 and 19, 1
R5 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume 3, October 1999

NA = Not applicable to the current model because the pathway utilizing the parameter was turned off. The RESRAD summary printout lists each parameter in this table and whether or not it was used in the site specific

SENSITIVITY ANALYSIS

2.6–ACRE AREA

6–INCH COVER

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Scenario Res. Gardener

Sensitivity Analysis for 2.6 Acre Model with 6" Cover

Applicable Pathways	
External Gamma	X
Inhalation	X
Plant Ingestion	X
Meat Ingestion	
Milk Ingestion	
Aquatic Foods	
Drinking Water	
Soil Ingestion	X
Radon	
Find Peak Pathway Doses	X

Total Parameters:	157
Sensitivity analysis performed on:	58

	Max Dose		# of Parameters above:
>1% Increase			24
>5% Increase	3.05	1.5	8
>10% Increase			5

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Contaminated Zone	Area of contaminated zone (m^2)	1.000E+04	1.052E+04	AREA	1.052E+04	NA				
	Thickness of contaminated zone (meters)	2.000E+00	3.000E+00	THICK0	3.000E+00	NA				
	Length parallel to aquifer flow (m)	1.000E+02	1.030E+02	LCZPAQ	1.030E+02	2	0.9851	0.9851	No Change	0.00%
Soil Concentrations	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	BRDL	2.500E+01	NA				
	Time since placement of material (yr)	0.000E+00		TI	0.000E+00	NA				
Calculation Times	Times for calculations (yr)	1.000E+00	1.000E+00	T(2)	1.000E+00	NA				
	Times for calculations (yr)	3.000E+00	3.000E+00	T(3)	3.000E+00	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Times for calculations (yr)	1.000E+01	1.000E+01	T(4)	1.000E+01	NA				
	Times for calculations (yr)	3.000E+01	3.000E+01	T(5)	3.000E+01	NA				
	Times for calculations (yr)	1.000E+02	1.000E+02	T(6)	1.000E+02	NA				
	Times for calculations (yr)	3.000E+02	3.000E+02	T(7)	3.000E+02	NA				
	Times for calculations (yr)	1.000E+03	1.000E+03	T(8)	1.000E+03	NA				
Soil Concentrations	Initial principal radionuclides (pCi/g): Ra-226	0.000E+00	3.600E-01	S1(4)	3.600E-01	NA				
	Initial principal radionuclides (pCi/g): Th-228	0.000E+00	0.000E+00	S1(7)	0.000E+00	NA				
	Initial principal radionuclides (pCi/g): Th-232	0.000E+00	0.000E+00	S1(8)	0.000E+00	NA				
	Initial principal radionuclides (pCi/g): U-234	0.000E+00	6.800E-01	S1(10)	6.800E-01	NA				
	Initial principal radionuclides (pCi/g): U-238	0.000E+00	6.800E-01	S1(11)	6.800E-01	NA				
Cover/Hydrology	Cover depth (m)	0.000E+00	0.000E+00	COVER0	arameter Justifi	2	0.625	1.5	Factor Decrease	52.27%
	Density of cover material (g/cm^3)	1.500E+00	1.630E+00	DENSCV	1.630E+00	1.5	0.83	1.21	Factor Decrease	22.83%
	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-04	VCV	1.000E-04	2	1.03	0.96	Factor Increase	4.56%
	Density of contaminated zone (g/cm^3)	1.500E+00	1.630E+00	DENSCZ	1.630E+00	1.5	1.03	0.91	Factor Increase	4.56%
	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-04	VCZ	1.000E-04	2	0.9851	0.9851	No Change	0.00%
	Contaminated zone total porosity	4.000E-01	4.000E-01	TPCZ	4.000E-01	2	0.9851	0.9851	No Change	0.00%
	Contaminated zone field capacity	2.000E-01	2.000E-01	FCCZ	2.000E-01	2	0.9851	0.9851	No Change	0.00%

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	HCCZ	1.000E+01	2	0.9851	0.9851	No Change	0.00%
	Contaminated zone b parameter	5.300E+00	5.300E+00	BCZ	5.300E+00	2	0.9851	0.9851	No Change	0.00%
	Average annual wind speed (m/sec)	2.000E+00	3.130E+00	WIND	2.000E+00	1.5	0.9851	0.9851	No Change	0.00%
	Humidity in air (g/cm^3)	8.000E+00	not used	HUMID	not used	NA				
	Evapotranspiration coefficient	5.000E-01	5.000E-01	EVAPTR	5.000E-01	1.5	1.03	0.95	Factor Increase	4.56%
	Precipitation (m/yr)	1.000E+00	1.016E+00	PRECIP	1.016E+00	1.5	0.94	1.01	Factor Decrease	2.53%
	Irrigation (m/yr)	2.000E-01	2.000E-01	RI	2.000E-01	2	0.9851	0.9851	No Change	0.00%
	Irrigation mode	overhead	overhead	IDITCH	overhead	NA				
	Runoff coefficient	2.000E-01	2.000E-01	RUNOFF	2.000E-01	1.5	0.99	0.98	Factor Increase	0.50%
	Watershed area for nearby stream or pond (m^2)	1.000E+06	1.000E+06	WAREA	1.000E+06	2	0.9851	0.9851	No Change	0.00%
	Accuracy for water/soil computations	1.000E-03	1.000E-03	EPS	1.000E-03	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Saturated Zone	Density of saturated zone (g/cm^3)	1.500E+00	1.630E+00	DENSAQ	1.630E+00	1.5	0.97	0.99	Factor Decrease	0.50%
	Saturated zone total porosity	4.000E-01	4.000E-01	TPSZ	4.000E-01	2	1.01	0.97	Factor Increase	2.53%
	Saturated zone effective porosity	2.000E-01	2.000E-01	EPSZ	2.000E-01	2	0.97	1.01	Factor Decrease	2.53%
	Saturated zone field capacity	2.000E-01	2.000E-01	FCSZ	2.000E-01	2	0.9851	0.9851	No Change	0.00%
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	HCSZ	1.000E+02	2	0.9851	0.9851	No Change	0.00%
	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	HGWT	2.000E-02	2	0.9851	0.9851	No Change	0.00%
	Saturated zone b parameter	5.300E+00	5.300E+00	BSZ	5.300E+00	2	0.9851	0.9851	No Change	0.00%
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	VWT	1.000E-03	3	0.97	0.9851	Factor Decrease	0.00%
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	DWBWT	1.000E+01	3	1.03	0.96	Factor Increase	4.56%
	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	MODEL	ND	NA				
	Well pumping rate (m^3/yr)	2.500E+02	2.500E+02	UW	2.500E+02	2	0.9851	0.9851	No Change	0.00%

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Unsaturated	Number of unsaturated zone strata	1	0.000E+00	NS	0.000E+00	NA				
	Unsat. zone 1, thickness (m)	4.000E+00	not used	H(1)	not used	NA				
	Unsat. zone 1, soil density (g/cm^3)	1.500E+00	not used	DENSUZ(1)	not used	NA				
	Unsat. zone 1, total porosity	4.000E-01	not used	TPUZ(1)	not used	NA				
	Unsat. zone 1, effective porosity	2.000E-01	not used	EPUZ(1)	not used	NA				
	Unsat. zone 1, field capacity	2.000E-01	not used	FCUZ(1)	not used	NA				
	Unsat. zone 1, soil-specific b parameter	5.300E+00	not used	BUZ(1)	not used	NA				
	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	not used	HCUZ(1)	not used	NA				
Soil Concentrations - Transport	Distribution coefficients for Ra-226									
	Contaminated zone (cm^3/g)	7.000E+01	7.000E+01	DCNUCC( )	7.000E+01	50	1.13	0.69	Factor Increase	14.71%
	Unsaturated zone (cm^3/g)	7.000E+01	7.000E+01	DCNUCC( )	7.000E+01	NA				
	Saturated zone (cm^3/g)	7.000E+01	7.000E+01	DCNUCU( )	7.000E+01	50	0.98	1.03	Factor Decrease	4.56%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				

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	Distribution coefficients for Th-228									
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	NA				
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for Th-232									
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	NA				
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-234									
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	0.9851	0.9851	No Change	0.00%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	0.985	1.01	Factor Decrease	2.53%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-238									

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	0.9851	0.9851	No Change	0.00%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	0.9851	1.01	Factor Decrease	2.53%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
Occupancy	Inhalation rate (m^3/yr)	8.400E+03	1.226E+04	INHALR	1.226E+04	1.5	0.9851	0.9851	No Change	0.00%
	Mass loading for inhalation (g/m^3)	1.000E-04	1.000E-04	MLINH	1.000E-04	5	0.9851	0.9851	No Change	0.00%
	Exposure duration (year)	3.000E+01	2.500E+01	ED	2.500E+01	NA				
	Shielding factor, inhalation	4.000E-01	5.000E-01	SHF3	5.000E-01	1.5	0.9851	0.9851	No Change	0.00%
	Shielding factor, external gamma	7.000E-01	5.512E-01	SHF1	5.512E-01	1.5	1.05	0.93	Factor Increase	6.59%
	Fraction of time spent indoors	5.000E-01	5.500E-01	FIND	5.500E-01	1.5	1.05	0.93	Factor Increase	6.59%

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Fraction of time spent outdoors (on site)	2.500E-01	2.100E-01	FOTD	2.100E-01	1.5	1.03	0.95	Factor Increase	4.56%
	Shape factor flag, external gamma	1.000E+00	1.000E+00	FS	1.000E+00	NA				
Ingestion, Dietary	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	4.150E+01	DIET(1)	4.150E+01	4	3.05	0.45	Factor Increase	209.61%
	Leafy vegetable consumption (kg/yr)	1.400E+01	2.750E+00	DIET(2)	2.750E+00	4	1.13	0.95	Factor Increase	14.71%
	Milk consumption (L/yr)	9.200E+01	not used	DIET(3)	not used	NA				
	Meat and poultry consumption (kg/yr)	6.300E+01	not used	DIET(4)	not used	NA				
	Fish consumption (kg/yr)	5.400E+00	not used	DIET(5)	not used	NA				
	Other seafood consumption (kg/yr)	9.000E-01	not used	DIET(6)	not used	NA				
	Soil ingestion rate (g/yr)	3.650E+01	1.825E+01	SOIL	1.825E+01	2	0.9851	0.9851	No Change	0.00%
	Drinking water intake (L/yr)	5.100E+02	not used	DWI	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contamination fraction of drinking water	1.000E+00	not used	FDW	not used	NA				
	Contamination fraction of household water	1.000E+00	not used	FHHW	not used	NA				
	Contamination fraction of livestock water	1.000E+00	not used	FLW	not used	NA				
	Contamination fraction of irrigation water	1.000E+00	1.000E+00	FIRW	1.000E+00	NA				
	Contamination fraction of aquatic food	5.000E-01	not used	FR9	not used	NA				
	Contamination fraction of plant food	-1.000E+00	-1.000E+00	FPLANT	-1.000E+00	NA				
	Contamination fraction of meat	-1.000E+00	not used	FMEAT	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contamination fraction of milk	-1.000E+00	not used	FMILK	not used	NA				
Ingestion, Non-Dietary	Livestock fodder intake for meat (kg/day)	6.800E+01	not used	LFI5	not used	NA				
	Livestock fodder intake for milk (kg/day)	5.500E+01	not used	LFI6	not used	NA				
	Livestock water intake for meat (L/day)	5.000E+01	not used	LWI5	not used	NA				
	Livestock water intake for milk (L/day)	1.600E+02	not used	LWI6	not used	NA				
	Livestock soil intake (kg/day)	5.000E-01	not used	LSI	not used	NA				
	Mass loading for foliar deposition (g/m^3)	1.000E-04	1.000E-04	MLFD	1.000E-04	2	0.9851	0.9851	No Change	0.00%
	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	DM	1.500E-01	2	1.01	0.98	Factor Increase	2.53%
	Depth of roots (m)	9.000E-01	9.000E-01	DROOT	9.000E-01	2	1.05	0.85	Factor Increase	6.59%
	Drinking water fraction from ground water	1.000E+00	not used	FGWDW	not used	NA				
	Household water fraction from ground water	1.000E+00	not used	FGWHH	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (Increase in dose)	% by which Dose is Increased
	Livestock water fraction from ground water	1.000E+00	not used	FGWLW	not used	NA				
	Irrigation fraction from ground water	1.000E+00	1.000E+00	FGWIR	1.000E+00	NA				
Ingestion, Non-Dietary - Plant Factors	Wet weight crop yield for Non-Leafy (kg/m^2)	7.000E-01	7.000E-01	YV(1)	7.000E-01	2	0.97	1	Factor Decrease	1.51%
	Wet weight crop yield for Leafy (kg/m^2)	1.500E+00	1.500E+00	YV(2)	1.500E+00	2	0.98	0.99	Factor Decrease	0.50%
	Wet weight crop yield for Fodder (kg/m^2)	1.100E+00	not used	YV(3)	not used	NA				
	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	TE(1)	1.700E-01	2	0.9851	0.98	Factor Increase	0.00%
	Growing Season for Leafy (years)	2.500E-01	2.500E-01	TE(2)	2.500E-01	2	0.9851	0.9851	No Change	0.00%
	Growing Season for Fodder (years)	8.000E-02	not used	TE(3)	not used	NA				
	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	TIV(1)	1.000E-01	2	1	0.97	Factor Increase	1.51%
	Translocation Factor for Leafy	1.000E+00	1.000E+00	TIV(2)	1.000E+00	NA				
	Translocation Factor for Fodder	1.000E+00	not used	TIV(3)	not used	NA				
	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RDRY(1)	2.500E-01	2	0.9851	0.9851	No Change	0.00%
	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RDRY(2)	2.500E-01	2	0.9851	0.9851	No Change	0.00%

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Dry Foliar Interception Fraction for Fodder	2.500E-01	not used	RDRY(3)	not used	NA				
	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RWET(1)	2.500E-01	2	1	0.97	Factor Increase	1.51%
	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RWET(2)	2.500E-01	2	0.99	0.98	Factor Increase	0.50%
	Wet Foliar Interception Fraction for Fodder	2.500E-01	not used	RWET(3)	not used	NA				
	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	WLAM	2.000E+01	2	1	0.97	Factor Increase	1.51%
Storage Times	Storage times of contaminated foodstuffs (days):									
	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	STOR_T(1)	1.400E+01	2	0.9851	0.9851	No Change	0.00%
	Leafy vegetables	1.000E+00	1.000E+00	STOR_T(2)	1.000E+00	5	0.9851	0.9851	No Change	0.00%
	Milk	1.000E+00	1.000E+00	STOR_T(3)	1.000E+00	NA				
	Meat and poultry	2.000E+01	2.000E+01	STOR_T(4)	2.000E+01	NA				
	Fish	7.000E+00	7.000E+00	STOR_T(5)	7.000E+00	NA				
	Crustacea and mollusks	7.000E+00	7.000E+00	STOR_T(6)	7.000E+00	NA				
	Well water	1.000E+00	1.000E+00	STOR_T(7)	1.000E+00	5	0.9851	0.9851	No Change	0.00%
	Surface water	1.000E+00	1.000E+00	STOR_T(8)	1.000E+00	5	0.9851	0.9851	No Change	0.00%
	Livestock fodder	4.500E+01	4.500E+01	STOR_T(9)	4.500E+01	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Radon	Thickness of building foundation (m)	1.500E-01	not used	FLOOR	not used	NA				
	Bulk density of building foundation (g/cm^3)	2.400E+00	not used	DENSFL	not used	NA				
	Total porosity of the cover material	4.000E-01	not used	TPCV	not used	NA				
	Total porosity of the building foundation	1.000E-01	not used	TPFL	not used	NA				
	Volumetric water content of the cover material	5.000E-02	not used	PH2OCV	not used	NA				
	Volumetric water content of the foundation	3.000E-02	not used	PH2OFL	not used	NA				
	Diffusion coefficient for radon gas (m/sec):		not used		not used	NA				
	in cover material	2.000E-06	not used	DIFCV	not used	NA				
	in foundation material	3.000E-07	not used	DIFFL	not used	NA				
	in contaminated zone soil	2.000E-06	not used	DIFCZ	not used	NA				
	Radon vertical dimension of mixing (m)	2.000E+00	not used	HMIX	not used	NA				
	Average building air exchange rate (1/hr)	5.000E-01	not used	REXG	not used	NA				

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RESRAD Menu	Parameter	Default	2.6 Acre No Cover	Parameter Name	2 Acre With Cover Value	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Height of the building (room) (m)	2.500E+00	not used	HRM	not used	NA				
	Building interior area factor	0.000E+00	not used	FAI	not used	NA				
	Building depth below ground surface (m)	-1.000E+00	not used	DMFL	not used	NA				
	Emanating power of Rn-222 gas	2.500E-01	not used	EMANA(1)	not used	NA				
	Emanating power of Rn-220 gas	1.500E-01	not used	EMANA(2)	not used	NA				

R1 = User's Manual for RESRAD Version 6.0, July 2001
R2 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume I, June 1994
R3 = Data Collection Handbook to Support Modeling Impacts of Radioactive Material In Soil, Argonne National Laboratory, April 1993
R4 = Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning, Handout, Nuclear Regulatory Commission Workshop, March 18 and 19, 19
R5 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume 3, October 1999

NA = Not applicable to the current model because the pathway utilizing the parameter was turned off. The RESRAD summary printout lists each parameter in this table and whether or not it was used in the site specific

SENSITIVITY ANALYSIS

3.5–ACRE AREA

2–FOOT COVER

SIMULATION 1

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Scenario Res. Gardener — Sensitivity Analysis for 3.5 Acre Model with 2' Cover Simulation 1

Applicable Pathways	
External Gamma	X
Inhalation	X
Plant Ingestion	X
Meat Ingestion	
Milk Ingestion	
Aquatic Foods	
Drinking Water	
Soil Ingestion	X
Radon	
Find Peak Pathway Doses	X

Dose: 1.857

Total Parameters:	157
Sensitivity analysis performed on:	57

Max Dose		# of Parameters above:	
2.75	1.87	>1% Increase	8
		>5% Increase	4
		>10% Increase	4

RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Contaminated Zone	Area of contaminated zone (m^2)	1.000E+04	6.670E+02	AREA	6.670E+02	NA				
	Thickness of contaminated zone (meters)	2.000E+00	9.000E-01	THICK0	9.000E-01	NA				
	Length parallel to aquifer flow (m)	1.000E+02	2.580E+01	LCZPAQ	2.580E+01	2	1.857	1.857	No Change	0.00%
Soil Concentrations	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	BRDL	2.500E+01	NA				
	Time since placement of material (yr)	0.000E+00		TI	0.000E+00	NA				
Calculation Times	Times for calculations (yr)	1.000E+00	1.000E+00	T(2)	1.000E+00	NA				
	Times for calculations (yr)	3.000E+00	3.000E+00	T(3)	3.000E+00	NA				
	Times for calculations (yr)	1.000E+01	1.000E+01	T(4)	1.000E+01	NA				
	Times for calculations (yr)	3.000E+01	3.000E+01	T(5)	3.000E+01	NA				
	Times for calculations (yr)	1.000E+02	1.000E+02	T(6)	1.000E+02	NA				
	Times for calculations (yr)	3.000E+02	3.000E+02	T(7)	3.000E+02	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Times for calculations (yr)	1.000E+03	1.000E+03	T(8)	1.000E+03	NA				
Soil Concentrations	Initial principal radionuclides (pCi/g): Ra-226	0.000E+00	1.250E-01	S1(4)	1.250E-01	NA				
	Initial principal radionuclides (pCi/g): Th-228	0.000E+00	1.250E-01	S1(7)	1.250E-01	NA				
	Initial principal radionuclides (pCi/g): Th-232	0.000E+00	1.250E-01	S1(8)	1.250E-01	NA				
	Initial principal radionuclides (pCi/g): U-234	0.000E+00	1.250E-01	S1(10)	1.250E-01	NA				
	Initial principal radionuclides (pCi/g): U-238	0.000E+00	1.250E-01	S1(11)	1.250E-01	NA				
Cover/Hydrology	Cover depth (m)	0.000E+00	0.000E+00	COVER0	0.000E+00	NA				
	Density of cover material (g/cm^3)	1.500E+00	1.630E+00	DENSCV	1.630E+00	NA				
	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-04	VCV	1.000E-04	NA				
	Density of contaminated zone (g/cm^3)	1.500E+00	1.630E+00	DENSCZ	1.630E+00	1.5	1.86	1.83	Factor Increase	0.16%
	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-04	VCZ	1.000E-04	2	1.857	1.857	No Change	0.00%

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose Is Increased
	Contaminated zone total porosity	4.000E-01	4.000E-01	TPCZ	4.000E-01	2	1.857	1.857	No Change	0.00%
	Contaminated zone field capacity	2.000E-01	2.000E-01	FCCZ	2.000E-01	2	1.857	1.857	No Change	0.00%
	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	HCCZ	1.000E+01	2	1.857	1.857	No Change	0.00%
	Contaminated zone b parameter	5.300E+00	5.300E+00	BCZ	5.300E+00	2	1.857	1.857	No Change	0.00%
	Average annual wind speed (m/sec)	2.000E+00	3.130E+00	WIND	3.130E+00	1.5	1.85	1.857	Factor Decrease	0.00%
	Humidity in air (g/cm^3)	8.000E+00	not used	HUMID	not used	NA				
	Evapotranspiration coefficient	5.000E-01	5.000E-01	EVAPTR	5.000E-01	1.5	1.89	1.86	Factor Increase	1.78%
	Precipitation (m/yr)	1.000E+00	1.016E+00	PRECIP	1.016E+00	1.5	1.84	1.87	Factor Decrease	0.70%
	Irrigation (m/yr)	2.000E-01	0.000E+00	RI	0.000E+00	NA				
	Irrigation mode	overhead	overhead	IDITCH	overhead	NA				
	Runoff coefficient	2.000E-01	2.000E-01	RUNOFF	2.000E-01	2	1.87	1.857	Factor Increase	0.70%
	Watershed area for nearby stream or pond (m^2)	1.000E+06	1.000E+06	WAREA	1.000E+06	2	1.857	1.857	No Change	0.00%
	Accuracy for water/soil computations	1.000E-03	1.000E-03	EPS	1.000E-03	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose Is Increased
Saturated Zone	Density of saturated zone (g/cm^3)	1.500E+00	1.630E+00	DENSAQ	1.630E+00	1.5	1.857	1.857	No Change	0.00%
	Saturated zone total porosity	4.000E-01	4.000E-01	TPSZ	4.000E-01	2	1.857	1.857	No Change	0.00%
	Saturated zone effective porosity	2.000E-01	2.000E-01	EPSZ	2.000E-01	2	1.857	1.857	No Change	0.00%
	Saturated zone field capacity	2.000E-01	2.000E-01	FCSZ	2.000E-01	2	1.857	1.857	No Change	0.00%
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	HCSZ	1.000E+02	2	1.857	1.857	No Change	0.00%
	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	HGWT	2.000E-02	2	1.857	1.857	No Change	0.00%
	Saturated zone b parameter	5.300E+00	5.300E+00	BSZ	5.300E+00	2	1.857	1.857	No Change	0.00%
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	VWT	1.000E-03	2	1.857	1.857	No Change	0.00%
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	DWIBWT	1.000E+01	3	1.857	1.857	No Change	0.00%
	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	MODEL	ND	NA				
	Well pumping rate (m^3/yr)	2.500E+02	2.500E+02	UW	2.500E+02	2	1.857	1.857	No Change	0.00%
Unsaturated	Number of unsaturated zone strata	1	0.000E+00	NS	0.000E+00	NA				
	Unsat. zone 1, thickness (m)	4.000E+00	not used	H(1)	not used	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (Increase in dose)	% by which Dose is Increased
	Unsat. zone 1, soil density (g/cm^3)	1.500E+00	not used	DENSUZ(1)	not used	NA				
	Unsat. zone 1, total porosity	4.000E-01	not used	TPUZ(1)	not used	NA				
	Unsat. zone 1, effective porosity	2.000E-01	not used	EPUZ(1)	not used	NA				
	Unsat. zone 1, field capacity	2.000E-01	not used	FCUZ(1)	not used	NA				
	Unsat. zone 1, soil-specific b parameter	5.300E+00	not used	BUZ(1)	not used	NA				
	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	not used	HCUZ(1)	not used	NA				
Soil Concentrations - Transport	Distribution coefficients for Ra-226									
	Contaminated zone (cm^3/g)	7.000E+01	3.548E+03	DCNUCC( )	3.548E+03	5	1.857	1.85	Factor Increase	0.00%
	Unsaturated zone (cm^3/g)	7.000E+01	not used	DCNUCC( )	not used	NA				
	Saturated zone (cm^3/g)	7.000E+01	3.548E+03	DCNUCU( )	3.548E+03	5	1.857	1.857	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for Th-228									
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	10	1.857	1.857	No Change	0.00%
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6 000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	10	1.857	1.857	No Change	0.00%
	Leach rate (/yr)	0 000E+00	0 000E+00	ALEACH( )	0.000E+00	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose Is Increased
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for Th-232									
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	10	1.857	1.857	No Change	0.00%
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	10	1.857	1.857	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-234									
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	1.857	1.857	No Change	0.00%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	1.857	1.857	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-238									
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	1.857	1.857	No Change	0.00%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	1.857	1.857	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				

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RESRAD Parameter Information
3.5 Acre Site

RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose Is Increased
Occupancy	Inhalation rate (m^3/yr)	8.400E+03	1.226E+04	INHALR	1.226E+04	1.5	1.87	1.857	Factor Increase	0.70%
	Mass loading for inhalation (g/m^3)	1.000E-04	1.000E-04	MLINH	1.000E-04	2	1.88	1.85	Factor Increase	1.24%
	Exposure duration (year)	3.000E+01	2.500E+01	ED	2.500E+01	NA				
	Shielding factor, inhalation	4.000E-01	5.000E-01	SHF3	5.000E-01	1.5	1.857	1.857	No Change	0 00%
	Shielding factor, external gamma	7.000E-01	5.512E-01	SHF1	5.512E-01	1.5	2.3	1.6	Factor Increase	23.86%
	Fraction of time spent indoors	5.000E-01	5.500E-01	FIND	5.500E-01	1.5	2.3	1.6	Factor Increase	23.86%
	Fraction of time spent outdoors (on site)	2.500E-01	2.100E-01	FOTD	2.100E-01	1.5	2.17	1.65	Factor Increase	16.86%
	Shape factor flag, external gamma	1.000E+00	1.000E+00	FS	1.000E+00	NA				
Ingestion, Dietary	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	4.150E+01	DIET(1)	4.150E+01	4	2.75	1.6	Factor Increase	48.09%
	Leafy vegetable consumption (kg/yr)	1.400E+01	2.750E+00	DIET(2)	2.750E+00	4	1.9	1.84	Factor Increase	2.32%

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RESRAD Parameter Information
3.5 Acre Site

RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Milk consumption (L/yr)	9.200E+01	not used	DIET(3)	not used	NA				
	Meat and poultry consumption (kg/yr)	6.300E+01	not used	DIET(4)	not used	NA				
	Fish consumption (kg/yr)	5.400E+00	not used	DIET(5)	not used	NA				
	Other seafood consumption (kg/yr)	9.000E-01	not used	DIET(6)	not used	NA				
	Soil ingestion rate (g/yr)	3.650E+01	1.825E+01	SOIL	1.825E+01	2	1.88	1.85	Factor Increase	1.24%
	Drinking water intake (L/yr)	5.100E+02	not used	DWI	not used	NA				
	Contamination fraction of drinking water	1.000E+00	not used	FDW	not used	NA				
	Contamination fraction of household water	1.000E+00	not used	FHHW	not used	NA				
	Contamination fraction of livestock water	1.000E+00	not used	FLW	not used	NA				
	Contamination fraction of irrigation water	1.000E+00	1.000E+00	FIRW	1.000E+00	NA				
	Contamination fraction of aquatic food	5.000E-01	not used	FR9	not used	NA				
	Contamination fraction of plant food	-1.000E+00	-1.000E+00	FPLANT	-1.000E+00	NA				

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RESRAD Parameter Information
3.5 Acre Site

RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose Is Increased
	Contamination fraction of meat	-1.000E+00	not used	FMEAT	not used	NA				
	Contamination fraction of milk	-1.000E+00	not used	FMILK	not used	NA				
Ingestion, Non-Dietary	Livestock fodder intake for meat (kg/day)	6.800E+01	not used	LFI5	not used	NA				
	Livestock fodder intake for milk (kg/day)	5.500E+01	not used	LFI6	not used	NA				
	Livestock water intake for meat (L/day)	5.000E+01	not used	LWI5	not used	NA				
	Livestock water intake for milk (L/day)	1.600E+02	not used	LWI6	not used	NA				
	Livestock soil intake (kg/day)	5.000E-01	not used	LSI	not used	NA				
	Mass loading for foliar deposition (g/m^3)	1.000E-04	1.000E-04	MLFD	1.000E-04	2	1.857	1.857	No Change	0.00%
	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	DM	1.500E-01	2	1.857	1.857	No Change	0.00%
	Depth of roots (m)	9.000E-01	9.000E-01	DROOT	9.000E-01	2	1.7	1.857	Factor Decrease	0.00%
	Drinking water fraction from ground water	1.000E+00	not used	FGWDW	not used	NA				
	Household water fraction from ground water	1.000E+00	not used	FGWHH	not used	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Livestock water fraction from ground water	1.000E+00	not used	FGWLW	not used	NA				
	Irrigation fraction from ground water	1.000E+00	1.000E+00	FGWIR	1.000E+00	NA				
Ingestion, Non-Dietary - Plant Factors	Wet weight crop yield for Non-Leafy (kg/m^2)	7.000E-01	7.000E-01	YV(1)	7.000E-01	2	1.857	1.857	No Change	0.00%
	Wet weight crop yield for Leafy (kg/m^2)	1.500E+00	1.500E+00	YV(2)	1.500E+00	2	1.857	1.857	No Change	0.00%
	Wet weight crop yield for Fodder (kg/m^2)	1.100E+00	not used	YV(3)	not used	NA				
	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	TE(1)	1.700E-01	2	1.857	1.857	No Change	0.00%
	Growing Season for Leafy (years)	2.500E-01	2.500E-01	TE(2)	2.500E-01		1.857	1.857	No Change	0.00%
	Growing Season for Fodder (years)	8.000E-02	not used	TE(3)	not used	NA				
	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	TIV(1)	1.000E-01	2	1.857	1.857	No Change	0.00%
	Translocation Factor for Leafy	1.000E+00	1.000E+00	TIV(2)	1.000E+00	NA				
	Translocation Factor for Fodder	1.000E+00	not used	TIV(3)	not used	NA				
	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RDRY(1)	2.500E-01	2	1.857	1.857	No Change	0.00%
	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RDRY(2)	2.500E-01	2	1.857	1.857	No Change	0.00%
	Dry Foliar Interception Fraction for Fodder	2.500E-01	not used	RDRY(3)	not used	NA				
	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RWET(1)	2.500E-01	2	1.857	1.857	No Change	0.00%

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (Increase in dose)	% by which Dose is Increased
	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RWET(2)	2.500E-01	2	1.857	1.857	No Change	0.00%
	Wet Foliar Interception Fraction for Fodder	2.500E-01	not used	RWET(3)	not used	NA				
	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	WLAM	2.000E+01	2	1.857	1.857	No Change	0.00%
Storage Times	Storage times of contaminated foodstuffs (days):									
	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	STOR_T(1)	1.400E+01	2	1.857	1.857	No Change	0.00%
	Leafy vegetables	1.000E+00	1.000E+00	STOR_T(2)	1.000E+00	5	1.857	1.857	No Change	0.00%
	Milk	1.000E+00	1.000E+00	STOR_T(3)	1.000E+00	NA				
	Meat and poultry	2.000E+01	2.000E+01	STOR_T(4)	2.000E+01	NA				
	Fish	7.000E+00	7.000E+00	STOR_T(5)	7.000E+00	NA				
	Crustacea and mollusks	7.000E+00	7.000E+00	STOR_T(6)	7.000E+00	NA				
	Well water	1.000E+00	1.000E+00	STOR_T(7)	1.000E+00	5	1.857	1.857	No Change	0.00%
	Surface water	1.000E+00	1.000E+00	STOR_T(8)	1.000E+00	5	1.857	1.857	No Change	0.00%
	Livestock fodder	4.500E+01	4.500E+01	STOR_T(9)	4.500E+01	NA				
Radon	Thickness of building foundation (m)	1.500E-01	not used	FLOOR	not used	NA				
	Bulk density of building foundation (g/cm^3)	2.400E+00	not used	DENSFL	not used	NA				
	Total porosity of the cover material	4.000E-01	not used	TPCV	not used	NA				
	Total porosity of the building foundation	1.000E-01	not used	TPFL	not used	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (Increase in dose)	% by which Dose is Increased
	Volumetric water content of the cover material	5.000E-02	not used	PH2OCV	not used	NA				
	Volumetric water content of the foundation	3.000E-02	not used	PH2OFL	not used	NA				
	Diffusion coefficient for radon gas (m/sec):		not used		not used	NA				
	in cover material	2.000E-06	not used	DIFCV	not used	NA				
	in foundation material	3.000E-07	not used	DIFFL	not used	NA				
	in contaminated zone soil	2.000E-06	not used	DIFCZ	not used	NA				
	Radon vertical dimension of mixing (m)	2.000E+00	not used	HMIX	not used	NA				
	Average building air exchange rate (1/hr)	5.000E-01	not used	REXG	not used	NA				
	Height of the building (room) (m)	2.500E+00	not used	HRM	not used	NA				
	Building interior area factor	0.000E+00	not used	FAI	not used	NA				
	Building depth below ground surface (m)	-1.000E+00	not used	DMFL	not used	NA				
	Emanating power of Rn-222 gas	2.500E-01	not used	EMANA(1)	not used	NA				
	Emanating power of Rn-220 gas	1.500E-01	not used	EMANA(2)	not used	NA				

R1 = User's Manual for RESRAD Version 6.0, July 2001

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' & 4' Cover Sim1	Parameter Name	3.5 Acre with 2' Cover Sim1	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased

R2 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume I, June 1994
R3 = Data Collection Handbook to Support Modeling Impacts of Radioactive Material In Soil, Argonne National Laboratory, April 1993
R4 = Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning, Handout, Nuclear Regulatory Commission Workshop, March 18 and 19, 19
R5 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume 3, October 1999

NA = Not applicable to the current model because the pathway utilizing the parameter was turned off. The RESRAD summary printout lists each parameter in this table and whether or not it was used in the site specific model.

SENSITIVITY ANALYSIS

3.5–ACRE AREA

2–FOOT COVER

SIMULATION 2

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Scenario Res. Gardener — Sensitivity Analysis for 3.5 Acre Model with 2' Cover Simulation 2

Applicable Pathways	
External Gamma	
Inhalation	
Plant Ingestion	X
Meat Ingestion	
Milk Ingestion	
Aquatic Foods	
Drinking Water	
Soil Ingestion	
Radon	
Find Peak Pathway Doses	X

Dose: 1.309

Total Parameters:	160
Sensitivity analysis performed on:	51

Max Dose		# of Parameters above:	
		>1% Increase	9
5	1.37	>5% Increase	4
		>10% Increase	3

RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Contaminated Zone	Area of contaminated zone (m^2)	1.000E+04	1.416E+04	AREA	1.416E+04	NA				
	Thickness of contaminated zone (meters)	2.000E+00	1.500E-01	THICK0	1.500E-01	NA				
	Length parallel to aquifer flow (m)	1.000E+02	1.190E+02	LCZPAQ	1.190E+02	2	1.309	1.309	No Change	0.00%
Soil Concentrations	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	BRDL	2.500E+01	NA				
	Time since placement of material (yr)	0.000E+00		TI	0.000E+00	NA				
Calculation Times	Times for calculations (yr)	1.000E+00	1.000E+00	T(2)	1.000E+00	NA				
	Times for calculations (yr)	3.000E+00	3.000E+00	T(3)	3.000E+00	NA				
	Times for calculations (yr)	1.000E+01	1.000E+01	T(4)	1.000E+01	NA				
	Times for calculations (yr)	3.000E+01	3.000E+01	T(5)	3.000E+01	NA				
	Times for calculations (yr)	1.000E+02	1.000E+02	T(6)	1.000E+02	NA				
	Times for calculations (yr)	3.000E+02	3.000E+02	T(7)	3.000E+02	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Times for calculations (yr)	1.000E+03	1.000E+03	T(8)	1.000E+03	NA				
Soil Concentrations	Initial principal radionuclides (pCi/g): Ra-226	0.000E+00	2.500E+00	S1(4)	2.500E+00	NA				
	Initial principal radionuclides (pCi/g): Th-228	0.000E+00	2.500E+00	S1(7)	2.500E+00	NA				
	Initial principal radionuclides (pCi/g): Th-232	0.000E+00	2.500E+00	S1(8)	2.500E+00	NA				
	Initial principal radionuclides (pCi/g): U-234	0.000E+00	2.500E+00	S1(10)	2.500E+00	NA				
	Initial principal radionuclides (pCi/g): U-238	0.000E+00	2.500E+00	S1(11)	2.500E+00	NA				
Cover/Hydrology	Cover depth (m)	0.000E+00	6.100E-01	COVER0	6.100E-01	NA				
	Density of cover material (g/cm^3)	1.500E+00	not used	DENSCV	NA	NA				
	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-04	VCV	1.000E-04	NA				
	Density of contaminated zone (g/cm^3)	1.500E+00	1.630E+00	DENSCZ	1.630E+00	1.5	1.4	1.2	Factor Increase	6.95%
	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-04	VCZ	1.000E-04	2	1.309	1.309	No Change	0.00%

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Contaminated zone total porosity	4.000E-01	4.000E-01	TPCZ	4.000E-01	2	1.309	1.309	No Change	0.00%
	Contaminated zone field capacity	2.000E-01	2.000E-01	FCCZ	2.000E-01	2	1.309	1.309	No Change	0.00%
	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	HCCZ	1.000E+01	2	1.309	1.309	No Change	0.00%
	Contaminated zone b parameter	5.300E+00	5.300E+00	BCZ	5.300E+00	2	1.309	1.309	No Change	0.00%
	Average annual wind speed (m/sec)	2.000E+00	3.130E+00	WIND	3.130E+00	1.5	1.309	1.309	No Change	0.00%
	Humidity in air (g/cm^3)	8.000E+00	not used	HUMID	NA	NA				
	Evapotranspiration coefficient	5.000E-01	5.000E-01	EVAPTR	5.000E-01	1.5	1.45	1.24	Factor Increase	10.77%
	Precipitation (m/yr)	1.000E+00	1.016E+00	PRECIP	1.016E+00	1.5	1.225	1.37	Factor Decrease	4.66%
	Irrigation (m/yr)	2.000E-01	2.000E-01	RI	2.000E-01	2	1.28	1.32	Factor Decrease	0.84%
	Irrigation mode	overhead	overhead	IDITCH	overhead	NA				
	Runoff coefficient	2.000E-01	2.000E-01	RUNOFF	2.000E-01	2	1.36	1.28	Factor Increase	3.90%
	Watershed area for nearby stream or pond (m^2)	1.000E+06	1.000E+06	WAREA	1.000E+06	2	1.309	1.309	No Change	0.00%
	Accuracy for water/soil computations	1.000E-03	1.000E-03	EPS	1.000E-03	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Saturated Zone	Density of saturated zone (g/cm^3)	1.500E+00	1.630E+00	DENSAQ	1.630E+00	1.5	1.309	1.309	No Change	0.00%
	Saturated zone total porosity	4.000E-01	4.000E-01	TPSZ	4.000E-01	2	1.309	1.309	No Change	0.00%
	Saturated zone effective porosity	2.000E-01	2.000E-01	EPSZ	2.000E-01	2	1.309	1.309	No Change	0.00%
	Saturated zone field capacity	2.000E-01	2.000E-01	FCSZ	2.000E-01	2	1.309	1.309	No Change	0.00%
	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	HCSZ	1.000E+02	2	1.309	1.309	No Change	0.00%
	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	HGWT	2.000E-02	2	1.309	1.309	No Change	0.00%
	Saturated zone b parameter	5.300E+00	5.300E+00	BSZ	5.300E+00	2	1.309	1.309	No Change	0.00%
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	VWT	1.000E-03	2	1.309	1.309	No Change	0.00%
	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	DWIBWT	1.000E+01	3	1.309	1.309	No Change	0.00%
	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	MODEL	ND	NA				
	Well pumping rate (m^3/yr)	2.500E+02	2.500E+02	UW	2.500E+02	2	1.309	1.309	No Change	0.00%
Unsaturated	Number of unsaturated zone strata	1	0.000E+00	NS	0.000E+00	NA				
	Unsat. zone 1, thickness (m)	4.000E+00	not used	H(1)	NA	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor Is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose Is Increased
	Unsat. zone 1, soil density (g/cm^3)	1.500E+00	not used	DENSUZ(1)	NA	NA				
	Unsat. zone 1, total porosity	4.000E-01	not used	TPUZ(1)	NA	NA				
	Unsat. zone 1, effective porosity	2.000E-01	not used	EPUZ(1)	NA	NA				
	Unsat. zone 1, field capacity	2.000E-01	not used	FCUZ(1)	NA	NA				
	Unsat. zone 1, soil-specific b parameter	5.300E+00	not used	BUZ(1)	NA	NA				
	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	not used	HCUZ(1)	NA	NA				
Soil Concentrations - Transport	Distribution coefficients for Ra-226									
	Contaminated zone (cm^3/g)	7.000E+01	3.548E+03	DCNUCC( )	3.548E+03	10	1.33	1.28	Factor Increase	1.60%
	Unsaturated zone (cm^3/g)	7.000E+01	not used	DCNUCC( )	NA	NA				
	Saturated zone (cm^3/g)	7.000E+01	3.548E+03	DCNUCU( )	3.548E+03	10	1.309	1.309	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
					0.000E+00					-100.00%
	Distribution coefficients for Th-228				0.000E+00					-100.00%
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	10	1.309	1.309	No Change	0.00%
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	10	1.309	1.309	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				

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	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for Th-232									
	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	10	1.309	1.309	No Change	0.00%
	Unsaturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCC( )	6.000E+04	NA				
	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	DCNUCU( )	6.000E+04	10	1.309	1.309	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-234									
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	1.309	1.335	Factor Decrease	1.99%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	1.309	1.309	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				
	Distribution coefficients for U-238									
	Contaminated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	10	1.309	1.335	Factor Decrease	1.99%
	Unsaturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCC( )	5.000E+01	NA				
	Saturated zone (cm^3/g)	5.000E+01	5.000E+01	DCNUCU( )	5.000E+01	10	1.309	1.309	No Change	0.00%
	Leach rate (/yr)	0.000E+00	0.000E+00	ALEACH( )	0.000E+00	NA				
	Solubility constant	0.000E+00	0.000E+00	SOLUBK( )	0.000E+00	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
Occupancy	Inhalation rate (m^3/yr)	8.400E+03	not used	INHALR	NA	NA				
	Mass loading for inhalation (g/m^3)	1.000E-04	not used	MLINH	NA	NA				
	Exposure duration (year)	3.000E+01	2.500E+01	ED	2.500E+01	NA				
	Shielding factor, inhalation	4.000E-01	not used	SHF3	NA	NA				
	Shielding factor, external gamma	7.000E-01	not used	SHF1	NA	NA				
	Fraction of time spent indoors	5.000E-01	not used	FIND	NA	NA				
	Fraction of time spent outdoors (on site)	2.500E-01	not used	FOTD	NA	NA				
	Shape factor flag, external gamma	1.000E+00	not used	FS	NA	NA				
Ingestion, Dietary	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	4.150E+01	DIET(1)	4.150E+01	4	5	0.5	Factor Increase	281.97%
	Leafy vegetable consumption (kg/yr)	1.400E+01	2.750E+00	DIET(2)	2.750E+00	4	1.55	1.25	Factor Increase	18.41%

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor is Decreased	Governing Sensitivity (increase in dose)	% by which Dose is Increased
	Milk consumption (L/yr)	9.200E+01	not used	DIET(3)	NA	NA				
	Meat and poultry consumption (kg/yr)	6.300E+01	not used	DIET(4)	NA	NA				
	Fish consumption (kg/yr)	5.400E+00	not used	DIET(5)	NA	NA				
	Other seafood consumption (kg/yr)	9.000E-01	not used	DIET(6)	NA	NA				
	Soil ingestion rate (g/yr)	3.650E+01	not used	SOIL	NA	NA				
	Drinking water intake (L/yr)	5.100E+02	not used	DWI	NA	NA				
	Contamination fraction of drinking water	1.000E+00	not used	FDW	NA	NA				
	Contamination fraction of household water	1.000E+00	not used	FHHW	NA	NA				
	Contamination fraction of livestock water	1.000E+00	not used	FLW	NA	NA				
	Contamination fraction of irrigation water	1.000E+00	not used	FIRW	NA	NA				
	Contamination fraction of aquatic food	5.000E-01	not used	FR9	NA	NA				
	Contamination fraction of plant food	-1.000E+00	-1.000E+00	FPLANT	-1.000E+00	NA				

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RESRAD Menu	Parameter	Default	3.5 Acre with 2' Cover Sim2	Parameter Name	3.5 Acre with 2' Cover Sim 2	Sensitivity Factor	Dose When Factor is Increased	Dose When Factor Is Decreased	Governing Sensitivity (increase in dose)	% by which Dose Is Increased
	Contamination fraction of meat	-1.000E+00	not used	FMEAT	NA	NA				
	Contamination fraction of milk	-1.000E+00	not used	FMILK	NA	NA				
Ingestion, Non-Dietary	Livestock fodder intake for meat (kg/day)	6.800E+01	not used	LFI5	NA	NA				
	Livestock fodder intake for milk (kg/day)	5.500E+01	not used	LFI6	NA	NA				
	Livestock water intake for meat (L/day)	5.000E+01	not used	LWI5	NA	NA				
	Livestock water intake for milk (L/day)	1.600E+02	not used	LWI6	NA	NA				
	Livestock soil intake (kg/day)	5.000E-01	not used	LSI	NA	NA				
	Mass loading for foliar deposition (g/m^3)	1.000E-04	1.000E-04	MLFD	1.000E-04	2	1.309	1.309	No Change	0.00%
	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	DM	1.500E-01	2	1.309	1.309	No Change	0.00%
	Depth of roots (m)	9.000E-01	9.000E-01	DROOT	9.000E-01	2	0.02	0.68	Factor Decrease	-48.05%
	Drinking water fraction from ground water	1.000E+00	not used	FGWDW	NA	NA				
	Household water fraction from ground water	1.000E+00	not used	FGWHH	NA	NA				

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	Livestock water fraction from ground water	1.000E+00	not used	FGWLW	NA	NA				
	Irrigation fraction from ground water	1.000E+00	1.000E+00	FGWIR	1.000E+00	NA				
					0.000E+00					-100.00%
Ingestion, Non-Dietary - Plant Factors	Wet weight crop yield for Non-Leafy (kg/m^2)	7.000E-01	7.000E-01	YV(1)	7.000E-01	2	1.309	1.309	No Change	0.00%
	Wet weight crop yield for Leafy (kg/m^2)	1.500E+00	1.500E+00	YV(2)	1.500E+00	2	1.309	1.309	No Change	0.00%
	Wet weight crop yield for Fodder (kg/m^2)	1.100E+00	not used	YV(3)	NA	NA				
	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	TE(1)	1.700E-01	2	1.309	1.309	No Change	0.00%
	Growing Season for Leafy (years)	2.500E-01	2.500E-01	TE(2)	2.500E-01		1.309	1.309	No Change	0.00%
	Growing Season for Fodder (years)	8.000E-02	not used	TE(3)	NA	NA				
	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	TIV(1)	1.000E-01	2	1.309	1.309	No Change	0.00%
	Translocation Factor for Leafy	1.000E+00	1.000E+00	TIV(2)	1.000E+00	NA				
	Translocation Factor for Fodder	1.000E+00	not used	TIV(3)	NA	NA				
	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RDRY(1)	2.500E-01	2	1.309	1.309	No Change	0.00%
	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RDRY(2)	2.500E-01	2	1.309	1.309	No Change	0.00%
	Dry Foliar Interception Fraction for Fodder	2.500E-01	not used	RDRY(3)	NA	NA				
	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	RWET(1)	2.500E-01	2	1.309	1.309	No Change	0.00%

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	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	RWET(2)	2.500E-01	2	1.309	1.309	No Change	0.00%
	Wet Foliar Interception Fraction for Fodder	2.500E-01	not used	RWET(3)	NA	NA				
	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	WLAM	2.000E+01	2	1.309	1.309	No Change	0.00%
Storage Times	Storage times of contaminated foodstuffs (days):									
	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	STOR_T(1)	1.400E+01	2	1.309	1.309	No Change	0.00%
	Leafy vegetables	1.000E+00	1.000E+00	STOR_T(2)	1.000E+00	5	1.309	1.309	No Change	0.00%
	Milk	1.000E+00	1.000E+00	STOR_T(3)	1.000E+00	NA				
	Meat and poultry	2.000E+01	2.000E+01	STOR_T(4)	2.000E+01	NA				
	Fish	7.000E+00	7.000E+00	STOR_T(5)	7.000E+00	NA				
	Crustacea and mollusks	7.000E+00	7.000E+00	STOR_T(6)	7.000E+00	NA				
	Well water	1.000E+00	1.000E+00	STOR_T(7)	1.000E+00	5	1.309	1.309	No Change	0.00%
	Surface water	1.000E+00	1.000E+00	STOR_T(8)	1.000E+00	5	1.309	1.309	No Change	0.00%
	Livestock fodder	4.500E+01	4.500E+01	STOR_T(9)	4.500E+01	NA				
Radon	Thickness of building foundation (m)	1.500E-01	not used	FLOOR	NA	NA				
	Bulk density of building foundation (g/cm^3)	2.400E+00	not used	DENSFL	NA	NA				
	Total porosity of the cover material	4.000E-01	not used	TPCV	NA	NA				
	Total porosity of the building foundation	1.000E-01	not used	TPFL	NA	NA				

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	Volumetric water content of the cover material	5.000E-02	not used	PH2OCV	NA	NA				
	Volumetric water content of the foundation	3.000E-02	not used	PH2OFL	NA	NA				
	Diffusion coefficient for radon gas (m/sec):		not used		NA	NA				
	in cover material	2.000E-06	not used	DIFCV	NA	NA				
	in foundation material	3.000E-07	not used	DIFFL	NA	NA				
	in contaminated zone soil	2.000E-06	not used	DIFCZ	NA	NA				
	Radon vertical dimension of mixing (m)	2.000E+00	not used	HMIX	NA	NA				
	Average building air exchange rate (1/hr)	5.000E-01	not used	REXG	NA	NA				
	Height of the building (room) (m)	2.500E+00	not used	HRM	NA	NA				
	Building interior area factor	0.000E+00	not used	FAI	NA	NA				
	Building depth below ground surface (m)	-1.000E+00	not used	DMFL	NA	NA				
	Emanating power of Rn-222 gas	2.500E-01	not used	EMANA(1)	NA	NA				
	Emanating power of Rn-220 gas	1.500E-01	not used	EMANA(2)	NA	NA				

R1 = User's Manual for RESRAD Version 6.0, July 2001

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R2 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume I, June 1994
R3 = Data Collection Handbook to Support Modeling Impacts of Radioactive Material In Soil, Argonne National Laboratory, April 1993
R4 = Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning, Handout, Nuclear Regulatory Commission Workshop, March 18 and 19, 1999.
R5 = Residual Radioactive Contamination From Decommissioning, NUREG/CR-5512-Volume 3, October 1999

NA = Not applicable to the current model because the pathway utilizing the parameter was turned off. The RESRAD summary printout lists each parameter in this table and whether or not it was used in the site specific model.