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Document Control Desk
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Washington, DC 20555-0001

Reference: (a) License No. DPR-3 (Docket No. 50-29)
(b) YAEC Letter to USNRC, "Submittal of YNPS License Termination Plan and Proposed Revision to Possession Only License," dated November 24, 2003, BYR 2003-080.
(c) YAEC Letter to USNRC, "Derived Concentration Guidelines Level (DCGL) and Area Factor Calculations for License Termination Plan (LTP)", dated January 19, 2004, BYR 2004-004.
(d) YAEC Letter to USNRC, "RESRAD-BUILD Calculation for License Termination Plan (LTP)", dated December 10, 2003, BYR 2003-102.
(e) YAEC Letter to USNRC, "RESRAD Calculation for License Termination Plan (LTP)", dated December 16, 2003, BYR 2003-105.

Subject: License Termination Plan (LTP) Update – Section 6 Appendices (A – N)

In accordance with our commitment in Reference (b), this letter updates Section 6 of the LTP for the Yankee Nuclear Power Station. The attached Appendices (A – N) incorporate the results of the calculations which were submitted in References (c), (d) and (e).

The remaining Appendix, providing the volumetric concrete DCGLs, is expected to be submitted in late February following its completion at Brookhaven National Laboratories.

If you have any questions, please contact us.

Sincerely,

YANKEE ATOMIC ELECTRIC COMPANY

J. A. Kay

James A. Kay
Principal Licensing Engineer

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# Appendix 6A

## Basis Document for Site-Specific Parameter Value Assignment, Soil

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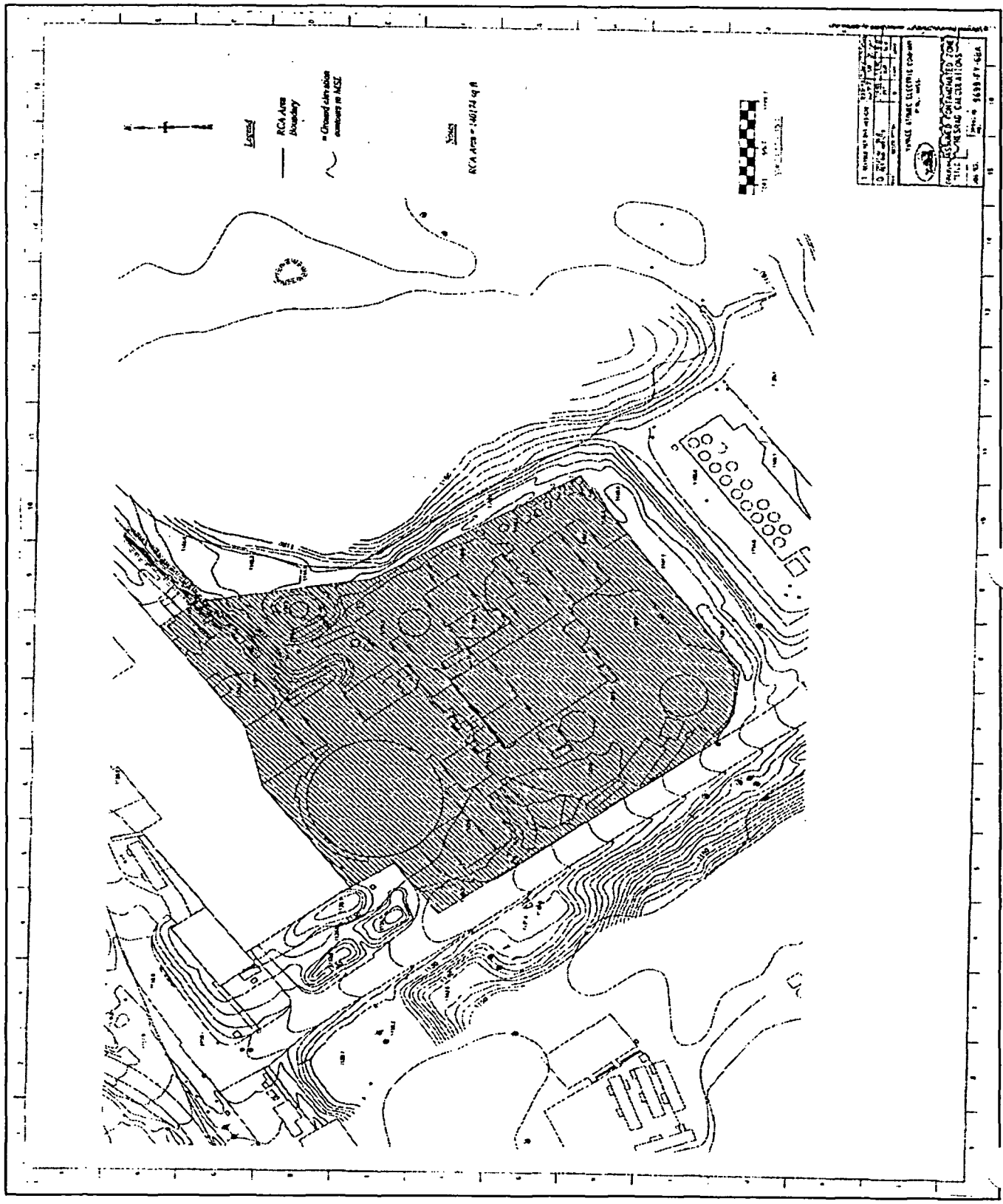
1. Area of the Contaminated Zone

Figure 1-1, (YR Drawing: 9699-FY-6BA Revision 1) was generated with AutoCAD Version 6. The area of the contaminated zone was drawn and calculated by the AutoCAD software and was found to be 140,174 $ft^2$. Converting this value into $m^2$: 140174 $ft^2$ x 9.29E-02 $m^2/ft^2$ = 13022$m^2$. Thus, the area of the contaminated zone was assigned a value of 13022$m^2$.

**Figure 1-1**



2. Contaminated Zone Erosion Rate

The slope of the contaminated zone was determined from the Rowe Site Closure Base Map (YR Drawing: 9699-FY-6BB, Revision 0) generated by AutoCAD Map Version 6. A line was extended from the contour line near Monitoring Well CB-2 to the contour line near Monitoring Well CB-3. The distance between the two wells is 700 feet, with a decreasing change in elevation from 1140 to 1120 feet. Thus, the slope at the Rowe site is 20' per 700', which corresponds to a 2.86% slope.

The following YR site drawing provides a transferable scale to the Vapor Containment
Reference: VC Site Drawing Number 9699-FV-1a
Scale: Outer Diameter of VC sphere = 125'

Data from NUREG/CR-6697, Attachment C, Section 3.8, 2nd paragraph of the section labeled "Discussion" were used to select the appropriate Erosion Rate that corresponds to the Rowe Site slope of 2.86%.

Table 2-1 provides values for Erosion Rate (m/y) corresponding to different percent slopes. The value for Erosion Rate representative of row-crop agriculture and a 2% slope (from NUREG/CR-6697, Att. C) is 6.0 E-4 m/y. Erosion Rates were then calculated for 5%, 10% and 15% slopes using the rate increase factors specified in Section 3.8 of NUREG/CR-6697.

Table 2-1 Erosion Rate

| Percent Slope | Erosion Rate (m/y) |
|---|---|
| 2 | 6.0E-4 |
| 5 | 1.8E-3 |
| 10 | 4.2E-3 |
| 15 | 9.0E-3 |

Using this Erosion Rate/percent slope data, the value for Erosion Rate corresponding to 2.86% is 8.5E-04 m/yr.

3. Humidity in Air

"Regional and Site-Specific Absolute Humidity Data for Use in Tritium Dose Calculations", Health Physics, Vol.39, pp. 318-320, 1980, provides a table of absolute humidity for selected locations in the United States. These values were calculated from data from the National Oceanic and Atmospheric Administration, 1977, Climatological Data, Annual Summary, Volume 28(13), United States Department of Commerce.

The value of 6.1 $g/m^3$ was chosen for the RESRAD humidity parameter corresponding to the Northeast region in the vicinity of Albany, NY, approximately 70 miles west of the YNPS.

4. Average Annual Wind Speed

The wind speed and direction, joint frequency distributions from Table 3.3-2 of the YNPS Environmental Decommissioning Report, dated December 1993, (Table 4-2) were used to calculate the average annual wind speed. The mid-range value was calculated for each of the ranges for which data were available. An average wind speed was calculated by summing the product of the mid-range value for each range and the percentage of time the wind was recorded to be within the range. A value of 2.03 m/s was assigned to this parameter.

Table 4- 1 Wind Speed

| Min. Wind Speed (mph) | Max. Wind Speed (mph) | Mid-Range Wind Speed (mph) | Percent of Time in Range | Mid-Range (weighted by percentage of time) |
|---|---|---|---|---|
| | | | | |
| 0.00 | 0.95 | 0.48 | 0.00 | 0.00 |
| 0.95 | 3.00 | 1.98 | 47.11 | 0.93 |
| 4.00 | 7.00 | 5.50 | 38.98 | 2.14 |
| 8.00 | 12.00 | 10.00 | 12.72 | 1.27 |
| 13.00 | 18.00 | 15.50 | 1.16 | 0.18 |
| 19.00 | 24.00 | 21.50 | 0.02 | 0.00 |
| | | | | |
| | | | Average: | 4.53 mph |

Converting to m/s: 4.53 mi/h x 1 m/6.214-04 mi x 1h/3600 s = 2.03 m/s

Table 4-2
Joint Frequency Distribution Table Produced by YAEC METROSE Computer Code Using Meteorological Data Collected at Yankee Nuclear Power Station Met Tower

## YNPS 35-Foot
## Wind Speed and Direction Joint Frequency Distributions
## 1988-1992

WIND DIRECTION FROM

| SPEED(MPH) | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | VRBL | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (1) | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| (2) | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| C-3 | 570 | 1010 | 1351 | 1672 | 2941 | 3952 | 2556 | 1741 | 1284 | 942 | 763 | 385 | 283 | 221 | 169 | 297 | 0 | 20137 |
| (1) | 1.33 | 2.36 | 3.16 | 3.91 | 6.88 | 9.25 | 5.98 | 4.07 | 3.00 | 2.20 | 1.78 | .90 | .66 | .52 | .40 | .69 | .00 | 47.11 |
| (2) | 1.33 | 2.36 | 3.16 | 3.91 | 6.88 | 9.25 | 5.98 | 4.07 | 3.00 | 2.20 | 1.78 | .90 | .66 | .52 | .40 | .69 | .00 | 47.11 |
| 4-7 | 1468 | 1363 | 975 | 727 | 761 | 374 | 455 | 773 | 1230 | 2046 | 2570 | 1176 | 773 | 565 | 625 | 783 | 0 | 16664 |
| (1) | 3.43 | 3.19 | 2.28 | 1.70 | 1.78 | .87 | 1.06 | 1.81 | 2.88 | 4.79 | 6.01 | 2.75 | 1.81 | 1.32 | 1.46 | 1.83 | .00 | 38.98 |
| (2) | 3.43 | 3.19 | 2.28 | 1.70 | 1.78 | .87 | 1.06 | 1.81 | 2.88 | 4.79 | 6.01 | 2.75 | 1.81 | 1.32 | 1.46 | 1.83 | .00 | 38.98 |
| 8-12 | 1137 | 952 | 263 | 35 | 4 | 2 | 2 | 13 | 96 | 483 | 1159 | 481 | 179 | 137 | 188 | 308 | 0 | 5439 |
| (1) | 2.66 | 2.23 | .62 | .08 | .01 | .00 | .00 | .03 | .22 | 1.13 | 2.71 | 1.13 | .42 | .32 | .44 | .72 | .00 | 12.72 |
| (2) | 2.66 | 2.23 | .62 | .08 | .01 | .00 | .00 | .03 | .22 | 1.13 | 2.71 | 1.13 | .42 | .32 | .44 | .72 | .00 | 12.72 |
| 13-18 | 141 | 195 | 12 | 1 | 0 | 0 | 0 | 0 | 1 | 12 | 116 | 9 | 1 | 1 | 0 | 7 | 0 | 496 |
| (1) | .33 | .46 | .03 | .00 | .00 | .00 | .00 | .00 | .00 | .03 | .27 | .02 | .00 | .00 | .00 | .02 | .00 | 1.16 |
| (2) | .33 | .46 | .03 | .00 | .00 | .00 | .00 | .00 | .00 | .03 | .27 | .02 | .00 | .00 | .00 | .02 | .00 | 1.16 |
| 19-24 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| (1) | .00 | .01 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .02 |
| (2) | .00 | .01 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .02 |
| GT 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (1) | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| (2) | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| ALL SPEEDS | 3318 | 3525 | 2602 | 2435 | 3706 | 4328 | 3013 | 2527 | 2611 | 3483 | 4610 | 2051 | 1236 | 924 | 982 | 1395 | 0 | 42746 |
| (1) | 7.76 | 8.25 | 6.09 | 5.70 | 8.67 | 10.12 | 7.05 | 5.91 | 6.11 | 8.15 | 10.78 | 4.80 | 2.89 | 2.16 | 2.30 | 3.26 | .00 | 100.00 |
| (2) | 7.76 | 8.25 | 6.09 | 5.70 | 8.67 | 10.12 | 7.05 | 5.91 | 6.11 | 8.15 | 10.78 | 4.80 | 2.89 | 2.16 | 2.30 | 3.26 | .00 | 100.00 |

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

5. Precipitation

Table 3.3-4 of the YNPS Environmental Decommissioning Report (December 1993) provides monthly mean precipitation totals for Readsboro, Vt., located approximately 5 miles from the YNPS. This information is based on data from the National Oceanic and Atmospheric Administration.

Table 5- 1 Mean Precipitation Rate

| Readsboro Monthly Mean Precipitation Totals (inches of water) | |
|---|---|
| Period:1961-1990 | |
| Month | Precipitation (inches) |
| Jan | 3.49 |
| Feb | 3.43 |
| Mar | 3.86 |
| April | 4.32 |
| May | 4.59 |
| Jun | 4.54 |
| Jul | 4.08 |
| Aug | 4.29 |
| Sept | 3.79 |
| Oct | 3.8 |
| Nov | 4.61 |
| Dec | 4.28 |
| Year Total | 49.08 |

Converting to meters/year: 49.08 in/y x 2.54 cm/in x m/100 cm = 1.2 m/y. The precipitation rate was assigned a value of 1.2 m/y.

6. Irrigation Rate (Evapotranspiration and Runoff Coefficients)

NUREG/CR-6697 Attachment C, Section 4.3 discusses the Irrigation Rate in terms of the Evapotranspiration Coefficient. Equation 4.3-1 of NUREG/CR-6697 expresses the Evapotranspiration Coefficient as:

$$Ce = \frac{ETr}{(1-Cr)(Pr) + IRr}$$

Where: ETr = the Evapotranspiration Rate (m/y)
Pr = the Precipitation Rate (m/y)
IRr = the Irrigation Rate (m/y) and
Cr = the Runoff Coefficient.

Based upon this equation, the Irrigation Rate can be expressed as:

$$IRr = \frac{ETr}{Ce} - (1-Cr)(Pr)$$

The input values for the variables in this equation:

- YA-REPT-00-002-03 (Ref. 1) cites a value for the average annual Evapotranspiration Rate, ETr, in the upper Housatonic River basin of 21.6 in/y or 0.549 m/y from 1931 to 1960.
- The Precipitation Rate, Pr, has been assigned a site-specific value of 1.2 m/y as discussed in Section 5 of this Attachment.
- Appendix E, Table E.1 of Ref. 2 provides the equation below to calculate the Runoff Coefficient, $C_r$, for an agricultural environment. Table E.1, Runoff Coefficient Values, also lists values for $c_1$, $c_2$ and $c_3$ for various environments:

$$C_r = 1 - c_1 - c_2 - c_3$$

$c_1$ = 0.1 for hilly land with an average slopes of 46 m/mi (Refer to section 2 of this Attachment for the site slope determination- 20' drop per 700' run or 46 m/mi).
$c_2$ = 0.2 for intermediate combinations of clay and loam as identified at the site in Ref. 3.
$c_3$ = 0.1 for cultivated lands which also fits the scenario for the site.

$$Cr = 1 - 0.1 - 0.2 - 0.1 = 0.6$$

- NUREG/CR-6697, Attachment C, Section 4.3-Evapotranspiration Coefficient, Ce, defines this parameter as the ratio of the total volume of water (a combination of evaporation from soil surfaces and transpiration from vegetation) transferred to the atmosphere to the total volume of water available within the root zone of the soil. The NUREG/CR recommends the use of a uniform distribution with minimum and maximum values of 0.5 and 0.75, respectively and with 0.625 as median. Any selected value for the irrigation rate should satisfy the Ce minimum to maximum range.

Substituting the minimum and maximum values of Ce into Equation 4.3-1 results in the following range for the Irrigation Rate, IRr:

Table 6- 1 Irrigation Rate

| Variable | "Min" Value | "Max" Value | Units |
|---|---|---|---|
| ETr | 0.549 | 0.549 | m/y |
| Pr | 1.2 | 1.2 | m/y |
| Cr | 0.6 | 0.6 | -- |
| Ce | 0.5 | 0.75 | -- |
| IRr | 0.252 | 0.618 | m/y |

Based on the calculated minimum and maximum IRr values, the median value is 0.435 m/y. A uniform distribution was assigned to this parameter and a positive input correlation to the Well Pumping Rate was assigned based upon guidance in NUREG/CR-6697 and NUREG/CR-6676.

7. Field Capacity: Contaminated Zone, Unsaturated Zone and Saturated Zone

The "Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil," (Ref. 3) defines the relationship of field capacity (residual water content) to effective porosity. The field capacity is the ratio of the volume of water retained in the soil sample, after all drainage has ceased, to the total volume of the soil sample. Equation 4.4 of Ref. 3 relates Total and Effective Porosity to Field Capacity as follows:

Effective Porosity = Total Porosity - Field Capacity

Thus,

Field Capacity = Total Porosity - Effective Porosity

The total and effective porosity values for the various zones are the mean values of the NUREG/CR-6697 distributions for sand.

Table 7- 1 Field Capacity

| Zone / Soil Type | Total Porosity | Effective Porosity | Field Capacity |
|---|---|---|---|
| Contaminated/sand | 0.43 | 0.383 | 0.047 |
| Unsaturated/sand | 0.43 | 0.383 | 0.047 |
| Saturated/sand | 0.43 | 0.383 | 0.047 |

8. Saturated Zone Hydraulic Gradient

NUREG/CR-6697, Attachment C, Section 3.6, discusses this parameter's use in the determination of the groundwater flow rate, which effects the rise time and the dilution of radionuclides in the well water. The method for calculating the hydraulic gradient is given in NUREG/CR-6697, Attachment C, Equation 3.6-1:

$$J_x = \frac{h_1 - h_2}{\Delta_x}$$

Where $h_1$ and $h_2$ represent the hydraulic heads or the water level elevations at location 1 and 2, and $\Delta_x$ is the distance between the two locations. The water level elevations are referenced to mean sea level, msl. This methodology was followed in YA -REPT-00-002-03, "Hydrogeological Parameter Estimates for Radiation Dose Modeling" (Ref. 1) to determine the average hydraulic gradient across the site. An average value for the site was calculated from three separate hydraulic gradient determinations as follows in Table 8.1. LTP Figure 2-8 shows the well locations.

Table 8- 1 Hydraulic Gradient

| Well / Location Designation | Water Level Elevation (msl), ft | Distance Between Wells, ft | Hydraulic Gradient, ft/ft |
|---|---|---|---|
| CB-3 | 1135 | | |
| Deerfield River below Sherman Dam | 1020 | 1000 | (1135-1020)/1000 = 0.115 |
| | | | |
| CB-3 | 1135 | | |
| CB-2 | 1105 | 533 | (1135-1105)/533 = 0.056 |
| | | | |
| CW-3 | 1132 | | |
| CB-1 | 1114 | 118 | (1132-1114)/118 = 0.152 |
| | | | Average = 0.1 |

The hydraulic gradient was assigned a value of 0.1 feet/foot.

9. Well Pumping Rate

NUREG/CR-6697, Attachment C Section 3.10 states that "a site-specific input distribution for well pumping rate can be determined as the sum of individual water needs." The household use component is calculated from the Domestic Water Use discussed in YA-REPT-00-002-03, Ref. 1.

Based upon the most recent data available, (1997 Census of Agriculture Volume 1: Part 21, Chapter 1, Massachusetts State-Level Data), irrigation of pastureland is not a common practice in Massachusetts. This data indicates that in Massachusetts, while 24,269 total acres of crop land were irrigated, only 295 total acres of pastureland were irrigated. Furthermore, only one farm, in Franklin County, claimed irrigation of pasture.

Table 9-1 Water Use Components Used to Determine Well Pumping Rate

| Water Use Components for a Family of Four | Median | Minimum | Maximum | Units |
|---|---|---|---|---|
| | | | | |
| **Household*** | **374** | **374** | **374** | $m^3/y$ |
| **Livestock** | **76.7** | **76.7** | **76.7** | $m^3/y$ |
| | | | | |
| Irrigation of vegetable plot | | | | |
| Contaminated fraction $f_p$ = min (Area/2000, 0.5) | 1 | 1 | 1 | |
| Irrigation rate $I_r$ (m/y) | 0.435 | 0.252 | 0.618 | |
| **Irrigation water** $f_p \times I_r \times 2000$ | **870** | **504** | **1236** | $m^3/y$ |
| | | | | |
| Irrigation of pasture (Not a New England practice.) | | | | |
| Contaminated fraction $f_m$ = Area/20,000 <= 1. | 1 | 1 | 1 | |
| Irrigation rate $I_r$ (m/y) | 0 | 0 | 0 | m/y |
| **Irrigation water** $f_m \times I_r \times 20{,}000$ | **0** | **0** | **0** | $m^3/y$ |
| | | | | |
| **Drinking water ****| **1.91** | **1.91** | **1.91** | $m^3/y$ |
| | | | | |
| TOTAL FOR A FAMILY OF FOUR | | | | |
| (sum of water components in **Bold** type) | **1323** | **957** | **1689** | $m^3/y$ |
| | | | | |
| | | | | |

A uniform distribution was assigned to this parameter with a positive correlation to the Irrigation Rate.

* Household Use: Domestic Water Use for family of four of 272 gallons per day (Ref. 1) minus the drinking water component of 1.91$m^3/y$.

** 478 l/y per individual adjusted to family of four and converted to $m^3/y$.

conversion: 478 l/y-Ind x 4 Ind x 1$m^3$/1000l = 1.91 $m^3/y$

272 gal/day x 3.79E-3 gal/$m^3$ x 365.25day/y = 376 $m^3/y$

10. Watershed for Nearby Stream or Pond

The following figure is taken from a letter to the USNRC from Yankee Atomic Electric Co., FYR 82-59, June 16, 1982, that delineates the watersheds to Wheeler Brook and to the site. An evaluation of this topographic map and the drainage areas is also included in Ref. 1.

The watershed area to the site is 0.3 square miles. Converting to square meters yields a total watershed area of 0.3 $mi^2$ x $(1609.3\ m/mi)^2$ = 7.77E+05 $m^2$. This parameter was assigned a value of 7.77E+05 $m^2$.

Figure 10- 1 Local Site Drainage Area



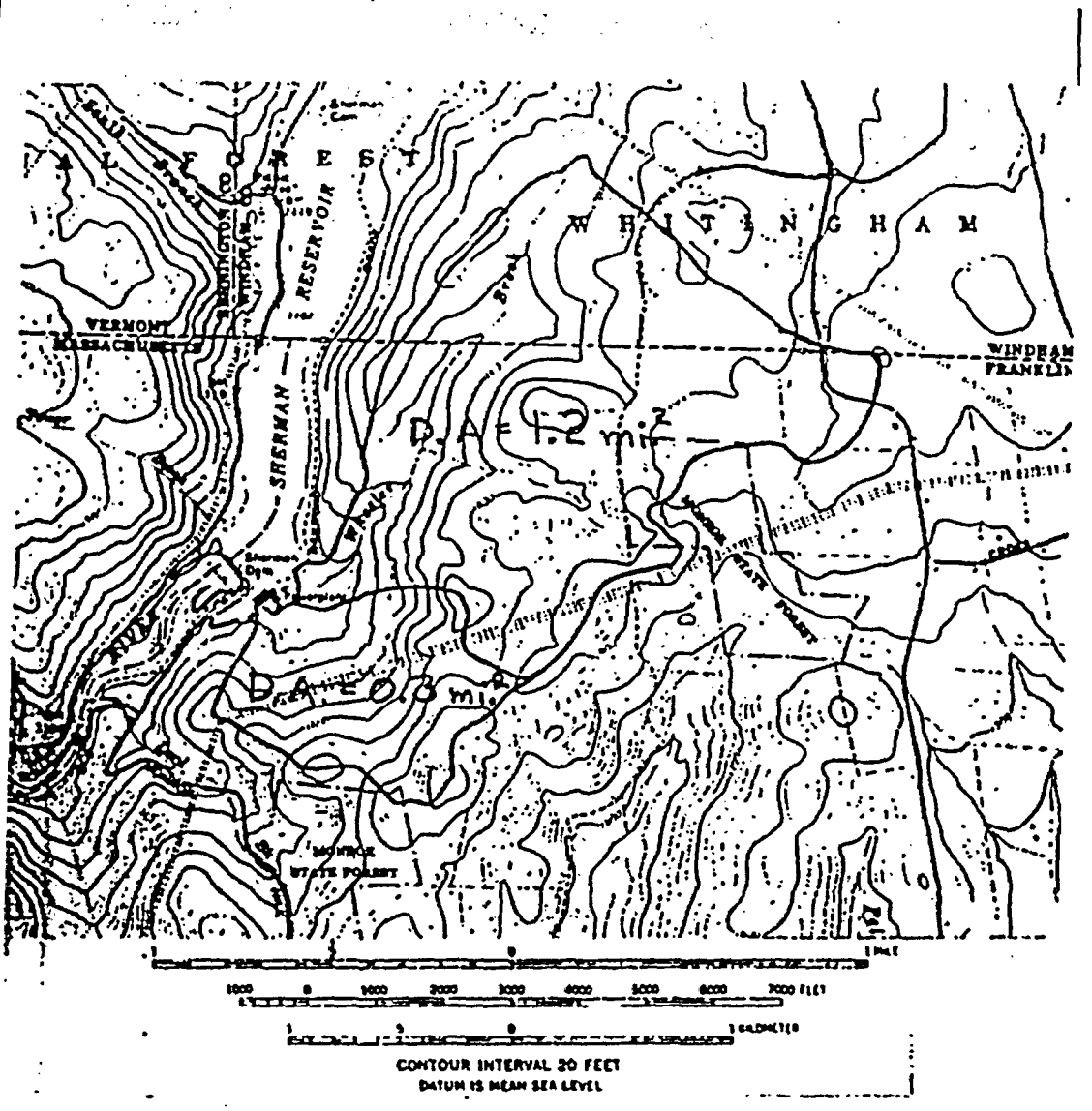



FIGURE 1

LOCAL SITE DRAINAGE AREAS

References:

1. YA-REPT-00-002-03, "Hydrogeological Parameter Estimates for Radiation Dose Modeling," May 2003.

2. ANL/EAD-4, "Users Manual for RESRAD Version 6.0," Yu, C. et al., July 2001.

3. Yu, C., et al., Argonne National Laboratory, "Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil," April 1993.

# Appendix 6B

## Input Parameter Values for Sensitivity Analysis, Soil

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| **Soil Concentrations** | | | | | | | | | | |
| Basic radiation dose limit (mrem/yr) | P | 3 | D | 25 | 10 CFR 20.1402 (Ref. 1) | NR | NR | NR | NR | |
| Initial principal radionuclide (pCi/g) | P | 2 | D | 1 | Assumed unit concentration | NR | NR | NR | NR | |
| **Distribution coefficients** (contam., unsat. and sat. zones) ($cm^3/g$) | | | | | | | | | | |
| Ac-227+progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Ag-108m | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.38 | 2.1 | 0.001 | 0.999 | 216 |
| Am-241 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.28 | 3.15 | 0.001 | 0.999 | 1445 |
| Am-243+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.28 | 3.15 | 0.001 | 0.999 | 1445 |
| C-14 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.4 | 3.22 | 0.001 | 0.999 | 11 |
| Cm-243 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.82 | 1.82 | 0.001 | 0.999 | 6761 |
| Co-60 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.46 | 2.53 | 0.001 | 0.999 | 235 |
| Cs-134 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.1 | 2.33 | 0.001 | 0.999 | 446 |
| Cs-137+progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.1 | 2.33 | 0.001 | 0.999 | 446 |
| Eu-152 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Eu-154 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Eu-155 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Fe-55 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.34 | 2.67 | 0.001 | 0.999 | 209 |
| Gd-152 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| H-3 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -2.81 | 0.5 | 0.001 | 0.999 | 0.06 |
| Nb-94 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.94 | 3.22 | 0.001 | 0.999 | 380 |
| Ni-63 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.05 | 1.46 | 0.001 | 0.999 | 424 |
| Np-237+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.84 | 2.25 | 0.001 | 0.999 | 17 |
| Pa-231 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.94 | 3.22 | 0.001 | 0.999 | 380 |
| Pb-210+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.78 | 2.76 | 0.001 | 0.999 | 2392 |
| Pu-238 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.86 | 1.89 | 0.001 | 0.999 | 953 |
| Pu-239 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.86 | 1.89 | 0.001 | 0.999 | 953 |
| Pu-241+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.86 | 1.89 | 0.001 | 0.999 | 953 |
| Ra-226+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.17 | 1.7 | 0.001 | 0.999 | 3533 |
| Sb-125 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.94 | 3.22 | 0.001 | 0.999 | 380 |
| Sr-90+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.45 | 2.12 | 0.001 | 0.999 | 32 |
| Tc-99 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -0.67 | 3.16 | 0.001 | 0.999 | 0.51 |
| Th-229+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.68 | 3.62 | 0.001 | 0.999 | 5884 |
| Th-230 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.68 | 3.62 | 0.001 | 0.999 | 5884 |
| U-233 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.84 | 3.13 | 0.001 | 0.999 | 126 |
| U-234 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.84 | 3.13 | 0.001 | 0.999 | 126 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| U-235+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.84 | 3.13 | 0.001 | 0.999 | 126 |
| Initial concentration of radionuclides present in groundwater (pCi/l) | P | 3 | D | 0 | Ground water assumed uncontaminated | NR | NR | NR | NR | |
| **Calculation Times** | | | | | | | | | | |
| Time since placement of material (yr) | P | 3 | D | 0 | | NR | NR | NR | NR | |
| Time for calculations (yr) | P | 3 | D | 0, 1, 3, 10, 30, 100, 300, 1000 | RESRAD Default | NR | NR | NR | NR | |
| **Contaminated Zone** | | | | | | | | | | |
| Area of contaminated zone ($m^2$) | P | 2 | D | 13022 | Site-specific- radiation control area (LTP App. 6A, Section 1) | NR | NR | NR | NR | |
| Thickness of contaminated zone (m) | P | 2 | S | Uniform | Minimum equal depth of soil mixing layer (0.15m); maximum equal depth to water table (3.8m) (Ref. 3) | 0.15 | 3.8 | NR | NR | 1.975 |
| Length parallel to aquifer flow (m) | P | 2 | D | 129 | Site-specific - diameter of circle with an area of 13022 $m^2$ (LTP App. 6A, Section 1) | NR | NR | NR | NR | |
| **Cover and Contaminated Zone Hydrological Data** | | | | | | | | | | |
| Cover depth (m) | P | 2 | D | 0 | No cover assumed | NR | NR | NR | NR | |
| Density of contaminated zone ($g/cm^3$) | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 1.5105 | 0.159 | 1.019 | 2.002 | 1.5105 |
| Contaminated zone erosion rate (m/yr) | P | 2 | D | 8.5E-04 | Calculated value based on site-specific slope of 2.9% (LTP App. 6A, Section 2) | NR | NR | NR | NR | |
| Contaminated zone total porosity | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 0.43 | 0.06 | 0.2446 | 0.6154 | 0.43 |
| Contaminated zone field capacity | P | 3 | D | 0.05 | Site-specific value (LTP App. 6A, Section 7) calculated using Equation 4.4 from Ref. 4 | NR | NR | NR | NR | 0.05 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] 1 | 2 | 3 | 4 | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| Contaminated zone hydraulic conductivity (m/yr) | P | 2 | S | Beta | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 110 | 5870 | 1.398 | 1.842 | 2506 |
| Contaminated zone b parameter | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | -0.0253 | 0.216 | 0.501 | 1.90 | 0.975 |
| Humidity in air (g/m$^3$) | P | 3 | D | 6.1 | Regional value. (LTP App. 6A, Section 3). | NR | NR | NR | NR | |
| Evapotranspiration coefficient | P | 2 | S | Uniform | NUREG/CR-6697 Att. C, (Ref. 2) | 0.5 | 0.75 | NR | NR | 0.625 |
| Average annual wind speed (m/sec) | P | 2 | D | 2.03 | Site-specific value calc. from site meteorological data (LTP App. 6A, Section 4) | NR | NR | NR | NR | |
| Precipitation (m/yr) | P | 2 | D | 1.2 | Site-specific value calculated from site geographical area precip. (LTP App. 6A, Section 5) | NR | NR | NR | NR | |
| Irrigation (m/yr) | B | 3 | S | Uniform | NUREG/CR-6697, Att. C methodology(Ref. 2, Att. L) | 0.252 | 0.618 | NR | NR | 0.435 |
| Irrigation mode | B | 3 | D | Overhead | Site-specific - overhead vs. ditch irrigation is standard practice in Eastern U. S. | NR | NR | NR | NR | |
| Runoff coefficient | P | 2 | D | 0.6 | NUREG/CR-6697, Att. C Section 4.2 methodology (Ref. 2, App. 6A, Section 6) | NR | NR | NR | NR | |
| Watershed area for nearby stream or pond (m$^2$) | P | 3 | D | 7.77E+05 | Site-specific- drainage area (LTP App. 6A, Section 10) | NR | NR | NR | NR | |
| Accuracy for water/soil computations | - | 3 | D | 1.00E-03 | RESRAD Default | NR | NR | NR | NR | |
| **Saturated Zone Hydrological Data** | | | | | | | | | | |
| Density of saturated zone (g/cm$^3$) | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 1.5105 | 0.159 | 1.019 | 2.002 | 1.5105 |
| Saturated zone total porosity | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 0.43 | 0.06 | 0.2446 | 0.6154 | 0.43 |
| Saturated zone effective porosity | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 0.383 | 0.0610 | 0.195 | 0.572 | 0.383 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Saturated zone field capacity | P | 3 | D | 0.05 | Site-specific value calculated using Equation 4.4 from Ref.4 (LTP App. 6A, Section 7) | NR | NR | NR | NR | 0.05 |
| Saturated zone hydraulic conductivity (m/yr) | P | 1 | S | Beta | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 110 | 5870 | 1.398 | 1.842 | 2506 |
| Saturated zone hydraulic gradient | P | 2 | D | 0.1 | Site gradient (LTP App. 6A, Section 8) | NR | NR | NR | NR | |
| Saturated zone b parameter | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | - 0.0253 | 0.216 | 0.501 | 1.90 | 0.975 |
| Water table drop rate (m/yr) | P | 3 | D | 1.00E-03 | RESRAD Default | NR | NR | NR | NR | |
| Well pump intake depth (m below water table) | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | . 6 | 10 | 30 | | 14.51 |
| Model: Nondispersion (ND) or Mass-Balance (MB) | P | 3 | D | ND | ND model recommended for contaminant areas > 1,000 $m^2$ (Ref. 4) | NR | NR | NR | NR | |
| Well pumping rate ($m^3$/yr) | P | 2 | S | Uniform | Min, Max, median value based on site irrigation and area and calculated according to NUREG/CR-6697, Att. C section 3.10 method. (Ref. 2 and LTP App. 6A, Section 9) | 957 | 1689 | NR | NR | 1323 |
| **Unsaturated Zone Hydrological Data** | | | | | | | | | | |
| Number of unsaturated zone strata | P | 3 | D | 1 | Site-specific value | NR | NR | NR | NR | |
| Unsat. zone 1, thickness (m) | P | 1 | S | Uniform | Assumes 0.15 to 3.8 m contaminated zone thickness and 3.8 m depth to water table (Ref. 3) | 0.01 | 3.65 | | | 1.82 |
| Unsat. zone 1, soil density (g/$cm^3$) | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 1.5105 | 0.159 | 1.019 | 2.002 | 1.5105 |
| Unsat. zone 1, total porosity | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 0.43 | 0.06 | 0.2446 | 0.6154 | 0.43 |
| Unsat. zone 1, effective porosity | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 0.383 | 0.0610 | 0.195 | 0.572 | 0.383 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Unsat. zone 1, field capacity | P | 3 | D | 0.05 | Site-specific value calculated using Equation 4.4 from Ref. 4 (LTP App. 6A, Section 7) | NR | NR | NR | NR | 0.05 |
| Unsat. zone 1, hydraulic conductivity (m/yr) | P | 2 | S | Beta | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | 110 | 5870 | 1.398 | 1.842 | 2506 |
| Unsat. zone 1, soil-specific b parameter | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697 dist. for site soil type: sand (Ref. 3) | -0.0253 | 0.216 | 0.501 | 1.90 | 0.975 |
| **Occupancy** | | | | | | | | | | |
| Inhalation rate ($m^3$/yr) | B | 3 | D | 8400 | NUREG/CR-6697, Att. C (Ref. 2) | NR | NR | NR | NR | |
| Mass loading for inhalation ($g/m^3$) | P | 2 | S | Continuous Linear | NUREG/CR-6697, Att. C (Ref. 2) | NR | NR | NR | NR | 2.33E-05 |
| Exposure duration | B | 3 | D | 30 | RESRAD Default | NR | NR | NR | NR | |
| Indoor dust filtration factor | P | 2 | S | Uniform | NUREG/CR-6697, Att. C (Ref. 2) | 0.15 | 0.95 | NR | NR | 0.55 |
| Shielding factor, external gamma | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -1.3 | 0.59 | 0.044 | 1 | 0.2725 |
| Fraction of time spent indoors | B | 3 | D | 0.6571 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Fraction of time spent outdoors (on site) | B | 3 | D | 0.1181 | NUREG/CR-5512, Vol. 3 Table 6.87 (outdoors + gardening) (Ref. 5) | NR | NR | NR | NR | |
| Shape factor flag, external gamma | P | 3 | D | Circular | RESRAD Default - Circular contaminated zone assumed | NR | NR | NR | NR | |
| **Ingestion, Dietary** | | | | | | | | | | |
| Fruits, vegetables, grain consumption (kg/yr) | B | 2 | D | 112 | NUREG/CR-5512, Vol. 3 (other vegetables + fruits + grain) (Ref. 5) | NR | NR | NR | NR | |
| Leafy vegetable consumption (kg/yr) | B | 3 | D | 21.4 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Milk consumption (L/yr) | B | 2 | D | 233 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Meat and poultry consumption (kg/yr) | B | 3 | D | 65.1 | NUREG/CR5512, Vol. 3 (beef + poultry) (Ref. 5) | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Fish consumption (kg/yr) | B | 3 | D | 20.6 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Other seafood consumption (kg/yr) | B | 3 | D | 0.9 | RESRAD Default | NR | NR | NR | NR | |
| Soil ingestion rate (g/yr) | B | 2 | D | 18.26 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Drinking water intake (L/yr) | B | 2 | D | 478.5 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Contamination fraction of drinking water | P | 3 | D | 1 | RESRAD Default - all water assumed contaminated | NR | NR | NR | NR | |
| Contamination fraction of household water (if used) | P | 3 | | NA | | | | | | |
| Contamination fraction of livestock water | P | 3 | D | 1 | RESRAD Default - all water assumed contaminated | NR | NR | NR | NR | |
| Contamination fraction of irrigation water | P | 3 | D | 1 | RESRAD Default - all water assumed contaminate | NR | NR | NR | NR | |
| Contamination fraction of aquatic food | P | 2 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Contamination fraction of plant food | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Contamination fraction of meat | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Contamination fraction of milk | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| | | | | | | | | | | |
| **Ingestion, Non-Dietary** | | | | | | | | | | |
| Livestock fodder intake for meat (kg/day) | M | 3 | D | 27.1 | NUREG/CR5512, Vol. 3 Table 6.87, beef cattle + poultry + layer hen (Ref. 5) | NR | NR | NR | NR | |
| Livestock fodder intake for milk (kg/day) | M | 3 | D | 63.2 | NUREG/CR5512, Vol. 3 Table 6.87, forage + grain + hay (Ref. 5) | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Livestock water intake for meat (L/day) | M | 3 | D | 50.6 | NUREG/CR5512, Vol. 3 Table 6.87, beef cattle + poultry + layer hen (Ref. 5) | NR | NR | NR | NR | |
| Livestock water intake for milk (L/day) | M | 3 | D | 60 | NUREG/CR5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Livestock soil intake (kg/day) | M | 3 | D | 0.5 | RESRAD Default | NR | NR | NR | NR | |
| Mass loading for foliar deposition ($g/m^3$) | P | 3 | D | 4.00E-04 | NUREG/CR-5512, Vol. 3 Table 6.87, gardening (Ref. 5) | NR | NR | NR | NR | |
| Depth of soil mixing layer (m) | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 0 | 0.15 | 0.6 | NR | 0.23 |
| Depth of roots (m) | P | 1 | S | Uniform | Min. from NUREG/CR-6697, Att. C (Ref. 2) Max. is site specific depth to water table (Ref. 3) | 0.3 | 3.8 | NR | NR | 2.05 |
| Drinking water fraction from ground water | P | 3 | D | 1 | RESRAD Default - all water assumed to be supplied from groundwater | NR | NR | NR | NR | |
| Household water fraction from ground water (if used) | P | 3 | | NA | | | | | | |
| Livestock water fraction from ground water | P | 3 | D | 1 | RESRAD Default - all water assumed to be supplied from groundwater | NR | NR | NR | NR | |
| Irrigation fraction from ground water | P | 3 | D | 1 | RESRAD Default - all water assumed to be supplied from groundwater | NR | NR | NR | NR | |
| Wet weight crop yield for Non-Leafy ($kg/m^2$) | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 0.56 | 0.48 | 0.001 | 0.999 | 1.75 |
| Wet weight crop yield for Leafy ($kg/m^2$) | P | 3 | D | 2.88921 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Wet weight crop yield for Fodder ($kg/m^2$) | P | 3 | D | 1.8868 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Growing Season for Non-Leafy (years) | P | 3 | D | 0.246 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Growing Season for Leafy (years) | P | 3 | D | 0.123 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Growing Season for Fodder (years) | P | 3 | D | 0.082 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Translocation Factor for Non-Leafy | P | 3 | D | 0.1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Translocation Factor for Leafy | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Translocation Factor for Fodder | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Weathering Removal Constant for Vegetation (1/yr) | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 5.1 | 18 | 84 | NR | 33 |
| Wet Foliar Interception Fraction for Non-Leafy | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Wet Foliar Interception Fraction for Leafy | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 0.06 | 0.67 | 0.95 | NR | 0.58 |
| Wet Foliar Interception Fraction for Fodder | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Dry Foliar Interception Fraction for Non-Leafy | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Dry Foliar Interception Fraction for Leafy | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| Dry Foliar Interception Fraction for Fodder | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 (Ref. 5) | NR | NR | NR | NR | |
| **Storage times of contaminated foodstuffs (days):** | | | | | | | | | | |
| Fruits, non-leafy vegetables, and grain | B | 3 | D | 14 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Leafy vegetables | B | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Milk | B | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 5) | NR | NR | NR | NR | |
| Meat and poultry | B | 3 | D | 20 | NUREG/CR-5512, Vol. 3 Table 6.87 (holdup period for beef) (Ref. 5) | NR | NR | NR | NR | |
| Fish | B | 3 | D | 7 | RESRAD Default | NR | NR | NR | NR | |
| Crustacea and mollusks | B | 3 | D | 7 | RESRAD Default | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Well water | B | 3 | D | 1 | RESRAD Default | NR | NR | NR | NR | |
| Surface water | B | 3 | D | 1 | RESRAD Default | NR | NR | NR | NR | |
| Livestock fodder | B | 3 | D | 45 | RESRAD Default | NR | NR | NR | NR | |
| **Special Radionuclides (C-14)** | | | | | | | | | | |
| C-12 concentration in water (g/cm3) | P | 3 | D | 2.00E-05 | RESRAD Default | NR | NR | NR | NR | |
| C-12 concentration in contaminated soil (g of C-12/g of soil) | P | 3 | D | 3.00E-02 | RESRAD Default | NR | NR | NR | NR | |
| Fraction of vegetation carbon from soil | P | 3 | D | 2.00E-02 | RESRAD Default | NR | NR | NR | NR | |
| Fraction of vegetation carbon from air | P | 3 | D | 9.80E-01 | RESRAD Default | NR | NR | NR | NR | |
| C-14 evasion layer thickness in soil (m) | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 0.2 | 0.3 | 0.6 | NR | 0.3 |
| C-14 evasion flux rate from soil (1/sec) | P | 3 | D | 7.00E-07 | RESRAD Default | NR | NR | NR | NR | |
| C-12 evasion flux rate from soil (1/sec) | P | 3 | D | 1.00E-10 | RESRAD Default | NR | NR | NR | NR | |
| Fraction of grain in beef cattle feed | B | 3 | D | 0.2500 | NUREG/CR-6697, Att. B (Ref. 2) | NR | NR | NR | NR | |
| Fraction of grain in milk cow feed | B | 3 | D | 0.1000 | NUREG/CR-6697, Att. B (Ref. 2) | NR | NR | NR | NR | |
| **Dose Conversion Factors (Inhalation mrem/pCi)** | | | | | | | | | | |
| Ac-227+ progeny | M | 3 | D | 6.72E+00 | FGR-11 (Ref. 6) (RESRAD Dose Conversion Library) | NR | NR | NR | NR | |
| Ag-108m | M | 3 | D | 2.83E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Am-241 | M | 3 | D | 4.44E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Am-243+ progeny | M | 3 | D | 4.40E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| C-14 | M | 3 | D | 2.09E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Cm-243 | M | 3 | D | 3.07E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Co-60 | M | 3 | D | 2.19E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Cs-134 | M | 3 | D | 4.63E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Cs-137+ progeny | M | 3 | D | 3.19E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Eu-152 | M | 3 | D | 2.21E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Eu-154 | M | 3 | D | 2.86E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Eu-155 | M | 3 | D | 4.14E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Fe-55 | M | 3 | D | 2.69E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Gd-152 | M | 3 | D | 2.43E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| H-3 | M | 3 | D | 6.40E-08 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Nb-94 | M | 3 | D | 4.14E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Ni-63 | M | 3 | D | 6.29E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Np-237+ progeny | M | 3 | D | 5.40E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pa-231 | M | 3 | D | 1.28E+00 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pb-210+ progeny | M | 3 | D | 1.38E-02 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pu-238 | M | 3 | D | 3.92E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pu-239 | M | 3 | D | 4.29E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pu-241+ progeny | M | 3 | D | 8.25E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Ra-226+ progeny | M | 3 | D | 8.60E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Sb-125 | M | 3 | D | 1.22E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Sr-90+ progeny | M | 3 | D | 1.31E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Tc-99 | M | 3 | D | 8.33E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Th-229+ progeny | M | 3 | D | 2.16E+00 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Th-230 | M | 3 | D | 3.26E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| U-233 | M | 3 | D | 1.35E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| U-234 | M | 3 | D | 1.32E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| U-235+ progeny | M | 3 | D | 1.23E-01 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| **Dose Conversion Factors** (Ingestion mrem/pCi) | | | | | | | | | | |
| Ac-227+ progeny | M | 3 | D | 1.48E-02 | FGR-11 (Ref. 6) (RESRAD Dose Conversion Library) | NR | NR | NR | NR | |
| Ag-108m | M | 3 | D | 7.62E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Am-241 | M | 3 | D | 3.64E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Am-243+ progeny | M | 3 | D | 3.63E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| C-14 | M | 3 | D | 2.09E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Cm-243 | M | 3 | D | 2.51E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Co-60 | M | 3 | D | 2.69E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Cs-134 | M | 3 | D | 7.33E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Cs-137+ progeny | M | 3 | D | 5.00E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Eu-152 | M | 3 | D | 6.48E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Eu-154 | M | 3 | D | 9.55E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Eu-155 | M | 3 | D | 1.53E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Fe-55 | M | 3 | D | 6.07E-07 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Gd-152 | M | 3 | D | 1.61E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| H-3 | M | 3 | D | 6.40E-08 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Nb-94 | M | 3 | D | 7.14E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Ni-63 | M | 3 | D | 5.77E-07 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Np-237+ progeny | M | 3 | D | 4.44E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pa-231 | M | 3 | D | 1.06E-02 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pb-210+ progeny | M | 3 | D | 5.37E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pu-238 | M | 3 | D | 3.20E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pu-239 | M | 3 | D | 3.54E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Pu-241+ progeny | M | 3 | D | 6.85E-05 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Ra-226+ progeny | M | 3 | D | 1.33E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Sb-125 | M | 3 | D | 2.81E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Sr-90+ progeny | M | 3 | D | 1.53E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Tc-99 | M | 3 | D | 1.46E-06 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Th-229+ progeny | M | 3 | D | 4.03E-03 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| Th-230 | M | 3 | D | 5.48E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| U-233 | M | 3 | D | 2.89E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| U-234 | M | 3 | D | 2.83E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |
| U-235+ progeny | M | 3 | D | 2.67E-04 | FGR-11 (Ref. 6) | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| **Plant Transfer Factors (pCi/g plant)/(pCi/g soil)** | | | | | | | | | | |
| Ac-227+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 1.1 | 0.001 | 0.999 | 1.0E-03 |
| Ag-108m | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.52 | 0.9 | 0.001 | 0.999 | 4.0E-03 |
| Am-241 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Am-243+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| C-14 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -0.36 | 0.9 | 0.001 | 0.999 | 7.0E-01 |
| Cm-243 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Co-60 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -2.53 | 0.9 | 0.001 | 0.999 | 8.0E-02 |
| Cs-134 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.22 | 1.0 | 0.001 | 0.999 | 4.0E-02 |
| Cs-137+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.22 | 1.0 | 0.001 | 0.999 | 4.0E-02 |
| Eu-152 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.1 | 0.001 | 0.999 | 2.0E-03 |
| Eu-154 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.1 | 0.001 | 0.999 | 2.0E-03 |
| Eu-155 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.1 | 0.001 | 0.999 | 2.0E-03 |
| Fe-55 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Gd-152 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.1 | 0.001 | 0.999 | 2.0E-03 |
| H-3 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 1.57 | 1.1 | 0.001 | 0.999 | 4.8E+00 |
| Nb-94 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 1.1 | 0.001 | 0.999 | 1.0E-02 |
| Ni-63 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.0 | 0.9 | 0.001 | 0.999 | 5.0E-02 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Np-237+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.91 | 0.9 | 0.001 | 0.999 | 2.0E-02 |
| Pa-231 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 1.1 | 0.001 | 0.999 | 1.0E-02 |
| Pb-210+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.52 | 0.9 | 0.001 | 0.999 | 4.0E-03 |
| Pu-238 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Pu-239 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Pu-241+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Ra-226+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.22 | 0.9 | 0.001 | 0.999 | 4.0E-02 |
| Sb-125 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 1.0 | 0.001 | 0.999 | 1.0E-02 |
| Sr-90+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -1.20 | 1.0 | 0.001 | 0.999 | 3.0E-01 |
| Tc-99 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 1.61 | 0.9 | 0.001 | 0.999 | 5.0E+00 |
| Th-229+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Th-230 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| U-233 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.9 | 0.001 | 0.999 | 2.0E-03 |
| U-234 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.9 | 0.001 | 0.999 | 2.0E-03 |
| U-235+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.9 | 0.001 | 0.999 | 2.0E-03 |
| **Meat Transfer Factors (pCi/kg)/(pCi/d)** | | | | | | | | | | |
| Ac-227+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -10.82 | 1.0 | 0.001 | 0.999 | 2.0E-05 |
| Ag-108m | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.7 | 0.001 | 0.999 | 2.0E-03 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Am-241 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.90 | 0.2 | 0.001 | 0.999 | 5.0E-05 |
| Am-243+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.90 | 0.2 | 0.001 | 0.999 | 5.0E-05 |
| C-14 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.47 | 1.0 | 0.001 | 0.999 | 3.1E-02 |
| Cm-243 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -10.82 | 1.0 | 0.001 | 0.999 | 2.0E-05 |
| Co-60 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.51 | 1.0 | 0.001 | 0.999 | 3.0E-02 |
| Cs-134 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.00 | 0.4 | 0.001 | 0.999 | 5.0E-02 |
| Cs-137+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.00 | 0.4 | 0.001 | 0.999 | 5.0E-02 |
| Eu-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | 2.0E-03 |
| Eu-154 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | 2.0E-03 |
| Eu-155 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | 2.0E-03 |
| Fe-55 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.51 | 0.4 | 0.001 | 0.999 | 3.0E-02 |
| Gd-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | 2.0E-03 |
| H-3 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.42 | 1.0 | 0.001 | 0.999 | 1.2E-02 |
| Nb-94 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.9 | 0.001 | 0.999 | 1.0E-06 |
| Ni-63 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.30 | 0.9 | 0.001 | 0.999 | 5.0E-03 |
| Np-237+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.7 | 0.001 | 0.999 | 1.0E-03 |
| Pa-231 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 1.0 | 0.001 | 0.999 | 5.0E-06 |
| Pb-210+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | 8.0E-04 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Pu-238 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.2 | 0.001 | 0.999 | 1.0E-04 |
| Pu-239 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.2 | 0.001 | 0.999 | 1.0E-04 |
| Pu-241+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.2 | 0.001 | 0.999 | 1.0E-04 |
| Ra-226+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.7 | 0.001 | 0.999 | 1.0E-03 |
| Sb-125 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | 1.0E-03 |
| Sr-90+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 0.4 | 0.001 | 0.999 | 1.0E-02 |
| Tc-99 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.7 | 0.001 | 0.999 | 1.0E-04 |
| Th-229+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 1.0 | 0.001 | 0.999 | 1.0E-04 |
| Th-230 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 1.0 | 0.001 | 0.999 | 1.0E-04 |
| U-233 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | 8.0E-04 |
| U-234 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | 8.0E-04 |
| U-235+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | 8.0E-04 |
| **Milk Transfer Factors (pCi/l)/(pCi/d)** | | | | | | | | | | |
| Ac-227+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.9 | 0.001 | 0.999 | 2.0E-06 |
| Ag-108m | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.12 | 0.7 | 0.001 | 0.999 | 6.0E-03 |
| Am-241 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.7 | 0.001 | 0.999 | 2.0E-06 |
| Am-243+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.7 | 0.001 | 0.999 | 2.0E-06 |
| C-14 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.4 | 0.9 | 0.001 | 0.999 | 1.2E-02 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Cm-243 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.9 | 0.001 | 0.999 | 2.0E-06 |
| Co-60 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.7 | 0.001 | 0.999 | 2.0E-03 |
| Cs-134 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 0.5 | 0.001 | 0.999 | 1.0E-02 |
| Cs-137+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 0.5 | 0.001 | 0.999 | 1.0E-02 |
| Eu-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | 6.0E-05 |
| Eu-154 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | 6.0E-05 |
| Eu-155 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | 6.0E-05 |
| Fe-55 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -8.11 | 0.7 | 0.001 | 0.999 | 3.0E-04 |
| Gd-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | 6.0E-05 |
| H-3 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.6 | 0.9 | 0.001 | 0.999 | 1.0E-02 |
| Nb-94 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.7 | 0.001 | 0.999 | 2.0E-06 |
| Ni-63 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.91 | 0.7 | 0.001 | 0.999 | 2.0E-02 |
| Np-237+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -11.51 | 0.7 | 0.001 | 0.999 | 1.0E-05 |
| Pa-231 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 0.9 | 0.001 | 0.999 | 5.0E-06 |
| Pb-210+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -8.11 | 0.9 | 0.001 | 0.999 | 3.0E-04 |
| Pu-238 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.5 | 0.001 | 0.999 | 1.0E-06 |
| Pu-239 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.5 | 0.001 | 0.999 | 1.0E-06 |
| Pu-241+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.5 | 0.001 | 0.999 | 1.0E-06 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Ra-226+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.5 | 0.001 | 0.999 | 1.0E-03 |
| Sb-125 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | 6.0E-05 |
| Sr-90+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.5 | 0.001 | 0.999 | 2.0E-03 |
| Tc-99 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.7 | 0.001 | 0.999 | 1.0E-03 |
| Th-229+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 0.9 | 0.001 | 0.999 | 5.0E-06 |
| Th-230 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 0.9 | 0.001 | 0.999 | 5.0E-06 |
| U-233 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.82 | 0.6 | 0.001 | 0.999 | 4.0E-04 |
| U-234 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.82 | 0.6 | 0.001 | 0.999 | 4.0E-04 |
| U-235+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.82 | 0.6 | 0.001 | 0.999 | 4.0E-04 |
| **Bioaccumulation Factors for Fish ((pCi/kg)/(pCi/l))** | | | | | | | | | | |
| Ac-227+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.7 | 1.1 | NR | NR | 1.5E+01 |
| Ag-108m | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 1.6 | 1.1 | NR | NR | 5.0E+00 |
| Am-241 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Am-243+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| C-14 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 10.8 | 1.1 | NR | NR | 4.9E+04 |
| Cm-243 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Co-60 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.7 | 1.1 | NR | NR | 3.0E+02 |
| Cs-134 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.6 | 0.7 | NR | NR | 2.0E+03 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Cs-137+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.6 | 0.7 | NR | NR | 2.0E+03 |
| Eu-152 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Eu-154 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Eu-155 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Fe-55 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.3 | 1.1 | NR | NR | 2.0E+02 |
| Gd-152 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.2 | 1.1 | NR | NR | 2.5E+01 |
| H-3 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 0 | 0.1 | NR | NR | 1.0E+00 |
| Nb-94 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.7 | 1.1 | NR | NR | 3.0E+02 |
| Ni-63 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| Np-237+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Pa-231 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| Pb-210+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.7 | 1.1 | NR | NR | 3.0E+02 |
| Pu-238 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Pu-239 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Pu-241+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Ra-226+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Sb-125 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| Sr-90+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.1 | 1.1 | NR | NR | 6.0E+01 |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Tc-99 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3 | 1.1 | NR | NR | 2.0E+01 |
| Th-229+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| Th-230 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| U-233 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| U-234 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| U-235+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| **Bioaccumulation Factors for Crustacea/ Mollusks ((pCi/kg)/(pCi/l))** | | | | | | | | | | |
| Ac-227+ progeny | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Ag-108m | P | 3 | D | 7.70E+02 | RESRAD Default | NR | NR | NR | NR | |
| Am-241 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Am-243+ progeny | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| C-14 | P | 3 | D | 9.10E+03 | RESRAD Default | NR | NR | NR | NR | |
| Cm-243 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Co-60 | P | 3 | D | 2.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Cs-134 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Cs-137+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Eu-152 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Eu-154 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Eu-155 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Fe-55 | P | 3 | D | 3.20E+03 | RESRAD Default | NR | NR | NR | NR | |
| Gd-152 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| H-3 | P | 3 | D | 1.00E+00 | RESRAD Default | NR | NR | NR | NR | |
| Nb-94 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Ni-63 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Np-237+ progeny | P | 3 | D | 4.00E+02 | RESRAD Default | NR | NR | NR | NR | |

## Input Parameters for Sensitivity Analysis, Soil
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Pa-231 | P | 3 | D | 1.10E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pb-210+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pu-238 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pu-239 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pu-241+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Ra-226+ progeny | P | 3 | D | 2.50E+02 | RESRAD Default | NR | NR | NR | NR | |
| Sr-90+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Sb-125 | P | 3 | D | 1.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| Tc-99 | P | 3 | D | 5.00E+00 | RESRAD Default | NR | NR | NR | NR | |
| Th-229+ progeny | P | 3 | D | 5.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Th-230 | P | 3 | D | 5.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| U-233 | P | 3 | D | 6.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| U-234 | P | 3 | D | 6.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| U-235+ progeny | P | 3 | D | 6.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| **Graphics Parameters** | | | | | | | | | | |
| Number of points | | | | 32 | RESRAD Default | NR | NR | NR | NR | |
| Spacing | | | | log | RESRAD Default | NR | NR | NR | NR | |
| **Time integration parameters** | | | | | | | | | | |
| Maximum number of points for dose | | | | 17 | RESRAD Default | NR | NR | NR | NR | |

Notes:

[a] P = physical, B = behavioral, M = metabolic; (see NUREG/CR-6697, Attachment B, Table 4.)
[b] 1 = high-priority parameter, 2 = medium-priority parameter, 3 = low-priority parameter (see NUREG/CR-6697, Attachment B, Table 4.1)
[c] D = deterministic, S = stochastic
[d] Distributions Statistical Parameters:
Lognormal-N: 1= mean, 2 = standard deviation
Bounded Lognormal-N: 1= mean, 2 = standard deviation, 3 = minimum, 4 = maximum
Truncated Lognormal-N: 1= mean, 2 = standard deviation, 3 = lower quantile, 4 = upper quantile
Bounded Normal: 1 = mean, 2 = standard deviation, 3 = minimum, 4 = maximum
Beta: 1 = minimum, 2 = maximum, 3 = P-value, 4 = Q-value
Triangular: 1 = minimum, 2 = mode, 3 = maximum
Uniform: 1 = minimum, 2 = maximum
NR = Not required

Additional Sensitivity Analysis Data:
Sampling Technique = Latin Hypercube
Number of observations =2000
Number of repetitions = 1
Input Rank Correlation Coefficients:

Thickness of contaminated zone and unsaturated zone = - 0.99
Total porosity and bulk density = - 0.99 (contaminated zone, unsaturated and saturated zones)
Total porosity and effective porosity = 0.96 (unsaturated and saturated zones)
Effective porosity and bulk density = -0.99 (unsaturated and saturated zones)
Well Pumping Rate and Irrigation Rate = 0.96

References:

1. Code of Federal Regulations, Title10, Section 20.1402, "Radiological Criteria for Unrestricted Use".

2. NUREG/CR-6697, "Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes", December 2000.

3. YA-REPT-00-008-03, "Evaluation of GeoTesting Express Soil Testing and Determination of Depth to Groundwater," December 2003

4. Yu, C. et al., "Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil"; US Department of Energy – Argonne National Laboratory, April 1993.

5. NUREG/CR-5512, Volume 3, "Residual Radioactive Contamination From Decommissioning: Parameter Analysis, Draft Report for Comment," October 1999.

6. Eckerman, K.F., et al., "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," EPA-520/1-88-020, Federal Guidance Report No. 11 (FGR-11), U.S. EPA, 1988.

# Appendix 6C

## Results of Sensitivity Analysis, Soil

| Results of Sensitivity Analysis, Soil (Based on the Partial Rank Correlation Coefficient [PRCC]) | | | |
|---|---|---|---|
| **Radionuclide** | **Sensitive Parameter** | **Units** | **PRCC** |
| **H-3** | Depth of roots | m | -0.59 |
| | Kd of H-3 in contaminated zone | $cm^3/g$ | -0.54 |
| | Thickness of contaminated zone | m | 0.45 |
| | | | |
| **C-14** | Depth of roots | m | -0.59 |
| | Thickness of contaminated zone | m | 0.48 |
| | Thickness of evasion layer of C | m | 0.35 |
| | | | |
| **Fe-55** | Meat transfer factor for Fe | pCi/kg per pCi/day | 0.92 |
| | Plant transfer factor for Fe | pCi/g plant per pCi/g soil | 0.68 |
| | | | |
| **Ni-63** | Plant transfer factor for Ni | pCi/g plant per pCi/g soil | 0.90 |
| | Milk transfer factor for Ni | pCi/l per pCi/day | 0.80 |
| | Depth of roots | m | -0.49 |
| | | | |
| **Co-60** | External gamma shielding factor | Unit-less | 0.95 |
| | Plant transfer factor for Co | pCi/g plant per pCi/g soil | 0.67 |
| | Meat transfer factor for Co | pCi/g plant per pCi/day | 0.36 |
| | | | |
| **Sr-90** | Plant transfer factor for Sr | pCi/g plant per pCi/g soil | 0.93 |
| | Depth of roots | m | -0.53 |
| | | | |
| **Nb-94** | External gamma shielding factor | Unit-less | 0.99 |
| | Kd of Nb in contaminated zone | $cm^3/g$ | 0.30 |
| | | | |
| **Tc-99** | Plant transfer factor for Tc | pCi/g plant per pCi/g soil | 0.88 |
| | Depth of roots | m | -0.44 |
| | Kd of Tc in contaminated zone | $cm^3/g$ | 0.49 |
| | | | |
| **Ag-108m** | External gamma shielding factor | Unit-less | 1.00 |
| | | | |
| **Sb-125** | External gamma shielding factor | Unit-less | 0.99 |
| | Kd of Sb in contaminated zone | $cm^3/g$ | 0.29 |
| | | | |
| **Cs-134** | External gamma shielding factor | Unit-less | 0.84 |
| | Plant transfer factor for Cs | pCi/g plant per pCi/g soil | 0.84 |
| | Depth of roots | m | -0.33 |
| | Milk transfer factor for Cs | pCi/l per pCi/day | 0.32 |
| | Meat transfer factor for Cs | pCi/kg per pCi/day | 0.25 |
| | | | |

| Results of Sensitivity Analysis, Soil (Based on the Partial Rank Correlation Coefficient [PRCC]) | | | |
|---|---|---|---|
| **Radionuclide** | **Sensitive Parameter** | **Units** | **PRCC** |
| **Cs-137** | Plant transfer factor for Cs | pCi/g plant per pCi/g soil | 0.88 |
| | External gamma shielding factor | Unit-less | 0.75 |
| | Depth of roots | m | -0.39 |
| | Milk transfer factor for Cs | pCi/l per pCi/day | 0.39 |
| | Meat transfer factor for Cs | pCi/kg per pCi/day | 0.31 |
| | | | |
| **Eu-152** | External gamma shielding factor | Unit-less | 0.99 |
| | | | |
| **Eu-154** | External gamma shielding factor | Unit-less | 0.99 |
| | | | |
| **Eu-155** | External gamma shielding factor | Unit-less | 0.99 |
| | Plant transfer factor for Eu | pCi/g plant per pCi/g soil | 0.29 |
| | | | |
| **Pu-238** | Plant transfer factor for Pu | pCi/g plant per pCi/g soil | 0.92 |
| | Depth of roots | m | -0.54 |
| | | | |
| **Pu-239** | Plant transfer factor for Pu | pCi/g plant per pCi/g soil | 0.92 |
| | Depth of roots | m | -0.53 |
| | | | |
| **Pu-241** | Plant transfer factor for Am | pCi/g plant per pCi/g soil | 0.85 |
| | Depth of roots | m | -0.44 |
| | Kd of Am-241 (parent radionuclide) in contaminated zone | $cm^3/g$ | 0.28 |
| | | | |
| **Am-241** | Plant transfer factor for Am | pCi/g plant per pCi/g soil | 0.92 |
| | Depth of roots | m | -0.54 |
| | | | |
| **Cm-243** | Plant transfer factor for Cm | pCi/g plant per pCi/g soil | 0.91 |
| | External gamma shielding factor | Unit-less | 0.58 |
| | Depth of roots | m | -0.50 |
| | | | |

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# Appendix 6D

## Input Parameter Values for Soil DCGL Determination

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] 1 | 2 | 3 | 4 | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Soil Concentrations** | | | | | | | | | | |
| Basic radiation dose limit (mrem/y) | | 3 | D | 25 | 10 CFR 20.1402 (Ref. 1) | NR | NR | NR | NR | |
| Initial principal radionuclide (pCi/g) | P | 2 | D | 1 | Unit Value | NR | NR | NR | NR | |
| **Distribution coefficients ($cm^3/g$) applied to contaminated, unsaturated, and saturated zone, unless otherwise noted** | | | | | | | | | | |
| Ac-227+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Ag-108m | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.38 | 2.1 | 0.001 | 0.999 | 216 |
| Am-241 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) – applied to saturated & unsaturated zones | 7.28 | 3.15 | 0.001 | 0.999 | |
| | | | D | 1.20E+04 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) – applied only to contaminated zone in Pu-241 RESRAD run | NR | NR | NR | NR | 1.45E+03 |
| Am-243+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.28 | 3.15 | 0.001 | 0.999 | 1445 |
| C-14 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.4 | 3.22 | 0.001 | 0.999 | 11 |
| Cm-243 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.82 | 1.82 | 0.001 | 0.999 | 6761 |
| Co-60 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.46 | 2.53 | 0.001 | 0.999 | 235 |
| Cs-134 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.1 | 2.33 | 0.001 | 0.999 | 446 |
| Cs-137+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.1 | 2.33 | 0.001 | 0.999 | 446 |
| Eu-152 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Eu-154 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Eu-155 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |
| Fe-55 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.34 | 2.67 | 0.001 | 0.999 | 209 |
| Gd-152 | P | 1 | S | Truncafted Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.72 | 3.22 | 0.001 | 0.999 | 825 |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] 1 | 2 | 3 | 4 | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| H-3 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) – applied to saturated and unsaturated zones. | -2.81 | 0.5 | 0.001 | 0.999 | 6.00E-02 |
| | | | D | 4.30E-02 | 25th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) – applied to contaminated zone only | NR | NR | NR | NR | |
| Nb-94 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) – applied to saturated and unsaturated zones. | 5.94 | 3.22 | 0.001 | 0.999 | |
| | | | D | 3.31E+03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) – applied to contaminated zone only | NR | NR | NR | NR | 3.80E+02 |
| Ni-63 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.05 | 1.46 | 0.001 | 0.999 | 424 |
| Np-237+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.84 | 2.25 | 0.001 | 0.999 | 17 |
| Pa-231 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.94 | 3.22 | 0.001 | 0.999 | 380 |
| Pb-210+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.78 | 2.76 | 0.001 | 0.999 | 2392 |
| Pu-238 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.86 | 1.89 | 0.001 | 0.999 | 953 |
| Pu-239 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.86 | 1.89 | 0.001 | 0.999 | 953 |
| Pu-241+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 6.86 | 1.89 | 0.001 | 0.999 | 953 |
| Ra-226+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.17 | 1.7 | 0.001 | 0.999 | 3533 |
| Sb-125 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) – applied to saturated and unsaturated zones. | 5.94 | 3.22 | 0.001 | 0.999 | |
| | | | D | 3.31E+03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) – applied to contaminated zone only | NR | NR | NR | NR | 3.80E+02 |
| Sr-90+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.45 | 2.12 | 0.001 | 0.999 | 32 |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Tc-99 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) – applied to saturated and unsaturated zones. | -0.67 | 3.16 | 0.001 | 0.999 | |
| | | | D | 4.28E+00 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) – applied to contaminated zone only | NR | NR | NR | NR | 5.10E-01 |
| Th-229+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.68 | 3.62 | 0.001 | 0.999 | 5884 |
| Th-230 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 8.68 | 3.62 | 0.001 | 0.999 | 5884 |
| U-233 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.84 | 3.13 | 0.001 | 0.999 | 126 |
| U-234 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.84 | 3.13 | 0.001 | 0.999 | 126 |
| U-235+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.84 | 3.13 | 0.001 | 0.999 | 126 |
| Initial concentration of radionuclides present in groundwater (pCi/l) | P | 3 | D | 0 | Assumed ground water uncontaminated | NR | NR | NR | NR | |
| **Calculation Times** | | | | | | | | | | |
| Time since placement of material (y) | P | 3 | D | 0 | | NR | NR | NR | NR | |
| Time for calculations (y) | P | 3 | D | 0, 1, 3, 10, 30, 100, 300, 1000 | RESRAD Default | NR | NR | NR | NR | |
| **Contaminated Zone** | | | | | | | | | | |
| Area of contaminated zone ($m^2$) | P | 2 | D | 13022 | Site-specific- radiation control area (LTP App. 6A, Section 1) | NR | NR | NR | NR | |
| Thickness of contaminated zone (m) | P | 2 | S | Uniform | Minimum equal depth of soil mixing layer (0.15m) ; maximum equal to depth to water table (3.8m) (Ref. 4) – applied to all nuclides except C-14 and H-3 | 0.15 | 3.8 | NR | NR | |
| | | | D | 2.89E+00 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) – applied to C-14 and H-3 only | NR | NR | NR | NR | 1.98E+00 |

## Input Parameter Values for Soil DCGL Determination

### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Length parallel to aquifer flow (m) | P | 2 | D | 129 | Site-specific - diameter of circle with an area of 13022 $m^2$ (LTP App. 6A, Section 1) | NR | NR | NR | NR | |
| **Cover and Contaminated Zone Hydrological Data** | | | | | | | | | | |
| Cover depth (m) | P | 2 | D | 0 | Site-specific - no cover assumed | NR | NR | NR | NR | |
| Density of contaminated zone ($g/cm^3$) | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 1.5105 | 0.159 | 1.019 | 2.002 | 1.5105 |
| Contaminated zone erosion rate (m/y) | P | 2 | D | 8.5E-04 | Calculated value based on site-specific slope of 2.9% (LTP App. 6A, Section 2) | NR | NR | NR | NR | |
| Contaminated zone total porosity | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 0.43 | 0.06 | 0.2446 | 0.6154 | 0.43 |
| Contaminated zone field capacity | P | 3 | D | 0.05 | Site-specific value calculated (LTP App. 6A, Section 7) using Equation 4.4 in Ref. 5 | NR | NR | NR | NR | 0.05 |
| Contaminated zone hydraulic conductivity (m/y) | P | 2 | S | Beta | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 110 | 5870 | 1.398 | 1.842 | 2506 |
| Contaminated zone b parameter | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | - 0.0253 | 0.216 | 0.501 | 1.90 | 0.975 |
| Humidity in air ($g/m^3$) | P | 3 | D | 6.1 | Regional value. (LTP App. 6A, Section 3) | NR | NR | NR | NR | |
| Evapotranspiration coefficient | P | 2 | S | Uniform | NUREG/CR-6697, Att. C (Ref. 2) | 0.5 | 0.75 | NR | NR | 0.625 |
| Average annual wind speed (m/sec) | P | 2 | D | 2.03 | Site-specific value calc. from site meteorological data (LTP App. 6A, Section 4) | NR | NR | NR | NR | |
| Precipitation (m/y) | P | 2 | D | 1.2 | Site-specific value calculated from site geographical area precip. (LTP App. 6A, Section 5) | NR | NR | NR | NR | |
| Irrigation (m/y) | B | 3 | S | Uniform | NUREG/CR-6697, Att. C methodology (Ref. 2) | 0.252 | 0.618 | NR | NR | 0.435 |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Irrigation mode | B | 3 | D | Overhead | Site-specific – overhead vs. ditch irrigation is standard practice in Eastern U. S. | NR | NR | NR | NR | |
| Runoff coefficient | P | 2 | D | 0.6 | NUREG/CR-6697, Att. C Section 4.2 methodology (Ref. 2, App. 6A, Section 6) | NR | NR | NR | NR | |
| Watershed area for nearby stream or pond ($m^2$) | P | 3 | D | 7.77E+05 | Site-specific- drainage area (LTP App. 6A, Section 10) | NR | NR | NR | NR | |
| Accuracy for water/soil computations | - | 3 | D | 1.00E-03 | RESRAD Default | NR | NR | NR | NR | |
| **Saturated Zone Hydrological Data** | | | | | | | | | | |
| Density of saturated zone ($g/cm^3$) | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 1.5105 | 0.159 | 1.019 | 2.002 | 1.5105 |
| Saturated zone total porosity | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 0.43 | 0.06 | 0.2446 | 0.6154 | 0.43 |
| Saturated zone effective porosity | P | 1 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 0.383 | 0.0610 | 0.195 | 0.572 | 0.383 |
| Saturated zone field capacity | P | 3 | D | 0.05 | Calculated site-specific value LTP App. 6A, Section 7) using Equation 4.4 from Ref. 5 | NR | NR | NR | NR | 0.05 |
| Saturated zone hydraulic conductivity (m/y) | P | 1 | S | Beta | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 110 | 5870 | 1.398 | 1.842 | 2506 |
| Saturated zone hydraulic gradient | P | 2 | D | 0.1 | Site gradient (LTP App. 6A, Section 8) | NR | NR | NR | NR | |
| Saturated zone b parameter | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | - 0.0253 | 0.216 | 0.501 | 1.90 | 0.975 |
| Water table drop rate (m/y) | P | 3 | D | 1.00E-03 | RESRAD Default | NR | NR | NR | NR | |
| Well pump intake depth (m below water table) | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 6 | 10 | 30 | NR | 14.51 |
| Model: Nondispersion (ND) or Mass-Balance (MB) | P | 3 | D | ND | ND model recommended for contaminant areas > 1,000 $m^2$ (Ref. 5) | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination

### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] 1 | 2 | 3 | 4 | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| Well pumping rate ($m^3/y$) | P | 2 | S | Uniform | Min, Max, median value based on site irrigation and area and calculated according to NUREG/CR-6697, Att. C section 3.10 method (Ref.. 2 and LTP App. 6A, Section 9) | 957 | 1689 | NR | NR | 1323 |
| **Unsaturated Zone Hydrological Data** | | | | | | | | | | |
| Number of unsaturated zone strata | P | 3 | D | 1 | Site-specific value | NR | NR | NR | NR | |
| Unsat. zone 1, thickness (m) | P | 1 | S | Uniform | Assumes 0.15 to 3.8 m contaminated zone thickness and 3.8 m depth to water table (Ref. 4) | 0.01 | 3.65 | NR | NR | 1.82 |
| Unsat. zone 1, soil density ($g/cm^3$) | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for6site soil type: sand (Ref. 4) | 1.5105 | 0.159 | 1.019 | 2.002 | 1.5105 |
| Unsat. zone 1, total porosity | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 0.43 | 0.06 | 0.2446 | 0.6154 | 0.43 |
| Unsat. zone 1, effective porosity | P | 2 | S | Bounded Normal | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 0.383 | 0.0610 | 0.195 | 0.572 | 0.383 |
| Unsat. zone 1, field capacity | P | 3 | D | 0.05 | Calculated site-specific value LTP App. 6A, Section 7, using Equation 4.4 from Ref. 5 | NR | NR | NR | NR | 0.05 |
| Unsat. zone 1, hydraulic conductivity (m/y) | P | 2 | S | Beta | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | 110 | 5870 | 1.398 | 1.842 | 2506 |
| Unsat. zone 1, soil-specific b parameter | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697 dist. for site soil type: sand (Ref. 4) | - 0.0253 | 0.216 | 0.501 | 1.90 | 0.975 |
| **Occupancy** | | | | | | | | | | |
| Inhalation rate ($m^3/y$) | B | 3 | D | 8400 | NUREG/CR-6697, Att. C (Ref. 2) | NR | NR | NR | NR | |
| Mass loading for inhalation ($g/m^3$) | P | 2 | S | Continuous Linear | NUREG/CR-6697, Att. C (Ref. 2) | NR | NR | NR | NR | 2.33E-05 |
| Exposure duration | B | 3 | D | 30 | RESRAD Default | NR | NR | NR | NR | |
| Indoor dust filtration factor | P | 2 | S | Uniform | NUREG/CR-6697, Att. C (Ref. 2) | 0.15 | 0.95 | NR | NR | 0.55 |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Shielding factor, external gamma | P | 2 | S | Bounded Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -1.3 | 0.59 | 0.044 | 1 | (0.2725) |
| | | | D | 3.98E-01 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) Applied to Ag-108m, Cm-243, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, Nb-94, and Sb-125. | NR | NR | NR | NR | 3.12E-01 |
| Fraction of time spent indoors | B | 3 | D | 0.6571 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Fraction of time spent outdoors (on site) | B | 3 | D | 0.1181 | NUREG/CR-5512, Vol. 3 Table 6.87 (outdoors + gardening) (Ref. 6) | NR | NR | NR | NR | |
| Shape factor flag, external gamma | P | 3 | D | Circular | RESRAD Default - Circular contaminated zone assumed | NR | NR | NR | NR | |
| **Ingestion, Dietary** | | | | | | | | | | |
| Fruits, vegetables, grain consumption (kg/y) | B | 2 | D | 112 | NUREG/CR-5512, Vol. 3 (other vegetables + fruits + grain) (Ref. 6) | NR | NR | NR | NR | |
| Leafy vegetable consumption (kg/y) | B | 3 | D | 21.4 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| Milk consumption (L/y) | B | 2 | D | 233 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| Meat and poultry consumption (kg/y) | B | 3 | D | 65.1 | NUREG/CR5512, Vol. 3 (beef + poultry) (Ref. 6) | NR | NR | NR | NR | |
| Fish consumption (kg/y) | B | 3 | D | 20.6 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| Other seafood consumption (kg/y) | B | 3 | D | 0.9 | RESRAD Default | NR | NR | NR | NR | |
| Soil ingestion rate (g/y) | B | 2 | D | 18.26 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| Drinking water intake (L/y) | B | 2 | D | 478.5 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Contamination fraction of drinking water | P | 3 | D | 1 | RESRAD Default - all water assumed contaminated | NR | NR | NR | NR | |
| Contamination fraction of household water (if used) | P | 3 | - | NA | - | | | | | |
| Contamination fraction of livestock water | P | 3 | D | 1 | RESRAD Default - all water assumed contaminated | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Contamination fraction of irrigation water | P | 3 | D | 1 | RESRAD Default - all water assumed contaminated | NR | NR | NR | NR | |
| Contamination fraction of aquatic food | P | 2 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| Contamination fraction of plant food | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| Contamination fraction of meat | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| Contamination fraction of milk | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 (Ref. 6) | NR | NR | NR | NR | |
| **Ingestion, Non-Dietary** | | | | | | | | | | |
| Livestock fodder intake for meat (kg/day) | M | 3 | D | 27.1 | NUREG/CR5512, Vol. 3 Table 6.87, beef cattle + poultry + layer hen (Ref. 6) | NR | NR | NR | NR | |
| Livestock fodder intake for milk (kg/day) | M | 3 | D | 63.2 | NUREG/CR5512, Vol. 3 Table 6.87, forage + grain + hay. (Ref. 6) | NR | NR | NR | NR | |
| Livestock water intake for meat (L/day) | M | 3 | D | 50.6 | NUREG/CR5512, Vol. 3 Table 6.87, beef cattle + poultry + layer hen (Ref. 6) | NR | NR | NR | NR | |
| Livestock water intake for milk (L/day) | M | 3 | D | 60 | NUREG/CR5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Livestock soil intake (kg/day) | M | 3 | D | 0.5 | RESRAD Default | NR | NR | NR | NR | |
| Mass loading for foliar deposition (g/m$^3$) | P | 3 | D | 4.00E-04 | NUREG/CR-5512, Vol. 3 Table 6.87, gardening (Ref. 6) | NR | NR | NR | NR | |
| Depth of soil mixing layer (m) | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 0 | 0.15 | 0.6 | NR | 0.23 |
| Depth of roots (m) | P | 1 | S | uniform | Min from NUREG/CR-6697,Att. C (Ref. 2). Max is site specific depth to water table | 0.3 | 3.8 | NR | NR | 2.05E+00 |
| | | | D | 1.17E+00 | 25th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) Applied to Am-241, C-14, Cm-243, Cs-134, Cs137, H-3, Ni-63, Pu-238, Pu239, Pu-241, Sr-90, and Tc-99 | NR | NR | NR | NR | |
| Drinking water fraction from ground water | P | 3 | D | 1 | RESRAD Default - all water assumed to be supplied from groundwater | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Household water fraction from ground water (if used) | P | 3 | | NA | | | | | | |
| Livestock water fraction from ground water | P | 3 | D | 1 | RESRAD Default - all water assumed to be supplied from groundwater | NR | NR | NR | NR | |
| Irrigation fraction from ground water | P | 3 | D | 1 | RESRAD Default - all water assumed to be supplied from groundwater | NR | NR | NR | NR | |
| Wet weight crop yield for Non-Leafy ($kg/m^2$) | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 0.56 | 0.48 | 0.001 | 0.999 | 1.75 |
| Wet weight crop yield for Leafy ($kg/m^2$) | P | 3 | D | 2.88921 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Wet weight crop yield for Fodder ($kg/m^2$) | P | 3 | D | 1.8868 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Growing Season for Non-Leafy (years) | P | 3 | D | 0.246 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Growing Season for Leafy (years) | P | 3 | D | 0.123 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Growing Season for Fodder (years) | P | 3 | D | 0.082 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Translocation Factor for Non-Leafy | P | 3 | D | 0.1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Translocation Factor for Leafy | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Translocation Factor for Fodder | P | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Weathering Removal Constant for Vegetation (1/y) | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 5.1 | 18 | 84 | NR | 33 |
| Wet Foliar Interception Fraction for Non-Leafy | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Wet Foliar Interception Fraction for Leafy | P | 2 | S | Triangular | NUREG/CR-6697, Att. C (Ref. 2) | 0.06 | 0.67 | 0.95 | NR | 0.58 |
| Wet Foliar Interception Fraction for Fodder | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Dry Foliar Interception Fraction for Non-Leafy | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] 1 | 2 | 3 | 4 | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| Dry Foliar Interception Fraction for Leafy | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Dry Foliar Interception Fraction for Fodder | P | 3 | D | 0.35 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| **Storage times of contaminated foodstuffs (days):** | | | | | | | | | | |
| Fruits, non-leafy vegetables, and grain | B | 3 | D | 14 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Leafy vegetables | B | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Milk | B | 3 | D | 1 | NUREG/CR-5512, Vol. 3 Table 6.87 (Ref. 6) | NR | NR | NR | NR | |
| Meat and poultry | B | 3 | D | 20 | NUREG/CR-5512, Vol. 3 Table 6.87 (holdup period for beef) (Ref. 6) | NR | NR | NR | NR | |
| Fish | B | 3 | D | 7 | RESRAD Default | NR | NR | NR | NR | |
| Crustacea and mollusks | B | 3 | D | 7 | RESRAD Default | NR | NR | NR | NR | |
| Well water | B | 3 | D | 1 | RESRAD Default | NR | NR | NR | NR | |
| Surface water | B | 3 | D | 1 | RESRAD Default | NR | NR | NR | NR | |
| Livestock fodder | B | 3 | D | 45 | RESRAD Default | NR | NR | NR | NR | |
| **Special Radionuclides (C-14)** | | | | | | | | | | |
| C-12 concentration in water (g/cm$^3$) | P | 3 | D | 2.00E-05 | RESRAD Default | NR | NR | NR | NR | |
| C-12 concentration in contaminated soil (g/g) | P | 3 | D | 3.00E-02 | RESRAD Default | NR | NR | NR | NR | |
| Fraction of vegetation carbon from soil | P | 3 | D | 2.00E-02 | RESRAD Default | NR | NR | NR | NR | |
| Fraction of vegetation carbon from air | P | 3 | D | 9.80E-01 | RESRAD Default | NR | NR | NR | NR | |
| C-14 evasion layer thickness in soil (m) | P | 2 | D | 4.27E-01 | 75th percentile value (from RESRAD (.mco) file created in SA (Ref. 3)) Applied only to C-14 | NR | NR | NR | NR | (3.00E-01) |
| C-14 evasion flux rate from soil (1/sec) | P | 3 | D | 7.00E-07 | RESRAD Default | NR | NR | NR | NR | |
| C-12 evasion flux rate from soil (1/sec) | P | 3 | D | 1.00E-10 | RESRAD Default | NR | NR | NR | NR | |
| Fraction of grain in beef cattle feed | B | 3 | D | 0.2500 | NUREG/CR-6697, Att. B (Ref. 2) | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Fraction of grain in milk cow feed | B | 3 | D | 0.1000 | NUREG/CR-6697, Att. B (Ref. 2) | NR | NR | NR | NR | |
| **Inhalation Exposure Dose Conversion Factors (mrem/pCi)** | | | | | | | | | | |
| Ac-227+ progeny | M | 3 | D | 6.72E+00 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Ag-108m | M | 3 | D | 2.83E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Am-241 | M | 3 | D | 4.44E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Am-243+ progeny | M | 3 | D | 4.40E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| C-14 | M | 3 | D | 2.09E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Cm-243 | M | 3 | D | 3.07E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Co-60 | M | 3 | D | 2.19E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Cs-134 | M | 3 | D | 4.63E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Cs-137+ progeny | M | 3 | D | 3.19E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Eu-152 | M | 3 | D | 2.21E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Eu-154 | M | 3 | D | 2.86E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Eu-155 | M | 3 | D | 4.14E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Fe-55 | M | 3 | D | 2.69E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Gd-152 | M | 3 | D | 2.43E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| H-3 | M | 3 | D | 6.40E-08 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Nb-94 | M | 3 | D | 4.14E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Ni-63 | M | 3 | D | 6.29E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Np-237+ progeny | M | 3 | D | 5.40E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pa-231 | M | 3 | D | 1.28E+00 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pb-210+ progeny | M | 3 | D | 1.38E-02 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pu-238 | M | 3 | D | 3.92E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pu-239 | M | 3 | D | 4.29E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pu-241+ progeny | M | 3 | D | 8.25E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Ra-226+ progeny | M | 3 | D | 8.60E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Sb-125 | M | 3 | D | 1.22E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination

### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Sr-90+ progeny | M | 3 | D | 1.31E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Tc-99 | M | 3 | D | 8.33E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Th-229+ progeny | M | 3 | D | 2.16E+00 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Th-230 | M | 3 | D | 3.26E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| U-233 | M | 3 | D | 1.35E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| U-234 | M | 3 | D | 1.32E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| U-235+ progeny | M | 3 | D | 1.23E-01 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| **Ingestion Exposure Dose Conversion Factors (mrem/pCi)** | | | | | | | | | | |
| Ac-227+ progeny | M | 3 | D | 1.48E-02 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Ag-108m | M | 3 | D | 7.62E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Am-241 | M | 3 | D | 3.64E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Am-243+ progeny | M | 3 | D | 3.63E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| C-14 | M | 3 | D | 2.09E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Cm-243 | M | 3 | D | 2.51E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Co-60 | M | 3 | D | 2.69E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Cs-134 | M | 3 | D | 7.33E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Cs-137+ progeny | M | 3 | D | 5.00E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Eu-152 | M | 3 | D | 6.48E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Eu-154 | M | 3 | D | 9.55E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Eu-155 | M | 3 | D | 1.53E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Fe-55 | M | 3 | D | 6.07E-07 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Gd-152 | M | 3 | D | 1.61E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| H-3 | M | 3 | D | 6.40E-08 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Nb-94 | M | 3 | D | 7.14E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Ni-63 | M | 3 | D | 5.77E-07 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Np-237+ progeny | M | 3 | D | 4.44E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pa-231 | M | 3 | D | 1.06E-02 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Pb-210+ progeny | M | 3 | D | 5.37E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pu-238 | M | 3 | D | 3.20E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pu-239 | M | 3 | D | 3.54E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Pu-241+ progeny | M | 3 | D | 6.85E-05 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Ra-226+ progeny | M | 3 | D | 1.33E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Sb-125 | M | 3 | D | 2.81E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Sr-90+ progeny | M | 3 | D | 1.53E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Tc-99 | M | 3 | D | 1.46E-06 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Th-229+ progeny | M | 3 | D | 4.03E-03 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| Th-230 | M | 3 | D | 5.48E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| U-233 | M | 3 | D | 2.89E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| U-234 | M | 3 | D | 2.83E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| U-235+ progeny | M | 3 | D | 2.67E-04 | FGR-11 (Ref. 7) | NR | NR | NR | NR | |
| **Plant Transfer Factors (pCi/g plant per pCi/g soil)** | | | | | | | | | | |
| Ac-227+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 1.1 | 0.001 | 0.999 | {1.0E-03} |
| Ag-108m | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.52 | 0.9 | 0.001 | 0.999 | {4.0E-03} |
| Am-241 | P | 1 | D | 1.83E-03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) Applied also in the Pu-241 RESRAD run | NR | NR | NR | NR | 1.48E-03 |
| Am-243+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | {1.0E-03} |
| C-14 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -0.36 | 0.9 | 0.001 | 0.999 | {7.0E-01} |
| Cm-243 | P | 1 | D | 1.83E-03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 1.48E-03 |
| Co-60 | P | 1 | D | 1.46E-01 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 1.18E-01 |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Cs-134 | P | 1 | D | 7.82E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 6.48E-02 |
| Cs-137+ progeny | P | 1 | D | 7.82E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 6.48E-02 |
| Eu-152 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.1 | 0.001 | 0.999 | (2.0E-03) |
| Eu-154 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.1 | 0.001 | 0.999 | (2.0E-03) |
| Eu-155 | P | 1 | D | 4.21E-03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 3.60E-3 |
| Fe-55 | P | 1 | D | 1.83E-03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 1.48E-03 |
| Gd-152 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.1 | 0.001 | 0.999 | (2.0E-03) |
| H-3 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 1.57 | 1.1 | 0.001 | 0.999 | (4.8E+00) |
| Nb-94 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 1.1 | 0.001 | 0.999 | (1.0E-02) |
| Ni-63 | P | 1 | D | 9.11E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 7.37E-02 |
| Np-237+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.91 | 0.9 | 0.001 | 0.999 | (2.0E-02) |
| Pa-231 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 1.1 | 0.001 | 0.999 | (1.0E-02) |
| Pb-210+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.52 | 0.9 | 0.001 | 0.999 | (4.0E-03) |
| Pu-238 | P | 1 | D | 1.83E-03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 1.48E-03 |
| Pu-239 | P | 1 | D | 1.83E-03 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 1.48E-03 |
| Pu-241+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | (1.0E-03) |
| Ra-226+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.22 | 0.9 | 0.001 | 0.999 | (4.0E-02) |
| Sb-125 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 1.0 | 0.001 | 0.999 | (1.0E-02) |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Sr-90+ progeny | P | 1 | D | 5.90E-01 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 4.88E-01 |
| Tc-99 | P | 1 | D | 9.16E+00 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 7.41E+00 |
| Th-229+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | {1.0E-03} |
| Th-230 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | {1.0E-03} |
| U-233 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.9 | 0.001 | 0.999 | {2.0E-03} |
| U-234 | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.9 | 0.001 | 0.999 | {2.0E-03} |
| U-235+ progeny | P | 1 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.9 | 0.001 | 0.999 | {2.0E-03} |
| **Meat Transfer Factors (pCi/kg per pCi/d)** | | | | | | | | | | |
| Ac-227+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -10.82 | 1.0 | 0.001 | 0.999 | {2.0E-05} |
| Ag-108m | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.7 | 0.001 | 0.999 | {2.0E-03} |
| Am-241 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.90 | 0.2 | 0.001 | 0.999 | {5.0E-05} |
| Am-243+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.90 | 0.2 | 0.001 | 0.999 | {5.0E-05} |
| C-14 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -3.47 | 1.0 | 0.001 | 0.999 | {3.1E-02} |
| Cm-243 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -10.82 | 1.0 | 0.001 | 0.999 | {2.0E-05} |
| Co-60 | P | 2 | D | 5.86E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 4.85E-02 |
| Cs-134 | P | 2 | D | 6.51E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 5.38E-02 |
| Cs-137+ progeny | P | 2 | D | 6.51E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 5.38E-02 |
| Eu-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | {2.0E-03} |
| Eu-154 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | {2.0E-03} |
| Eu-155 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | {2.0E-03} |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Fe-55 | P | 2 | D | 3.91E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 3.23E-02 |
| Gd-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 1.0 | 0.001 | 0.999 | (2.0E-03) |
| H-3 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.42 | 1.0 | 0.001 | 0.999 | (1.2E-02) |
| Nb-94 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.9 | 0.001 | 0.999 | (1.0E-06) |
| Ni-63 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.30 | 0.9 | 0.001 | 0.999 | (5.0E-03) |
| Np-237+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.7 | 0.001 | 0.999 | (1.0E-03) |
| Pa-231 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 1.0 | 0.001 | 0.999 | (5.0E-06) |
| Pb-210+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | (8.0E-04) |
| Pu-238 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.2 | 0.001 | 0.999 | (1.0E-04) |
| Pu-239 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.2 | 0.001 | 0.999 | (1.0E-04) |
| Pu-241+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.2 | 0.001 | 0.999 | (1.0E-04) |
| Ra-226+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.7 | 0.001 | 0.999 | (1.0E-03) |
| Sb-125 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.9 | 0.001 | 0.999 | (1.0E-03) |
| Sr-90+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.61 | 0.4 | 0.001 | 0.999 | (1.0E-02) |
| Tc-99 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 0.7 | 0.001 | 0.999 | (1.0E-04) |
| Th-229+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 1.0 | 0.001 | 0.999 | (1.0E-04) |
| Th-230 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.21 | 1.0 | 0.001 | 0.999 | (1.0E-04) |
| U-233 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | (8.0E-04) |
| U-234 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | (8.0E-04) |
| U-235+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.13 | 0.7 | 0.001 | 0.999 | (8.0E-04) |
| **Milk Transfer Factors (pCi/l per pCi/d)** | | | | | | | | | | |
| Ac-227+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.9 | 0.001 | 0.999 | (2.0E-06) |
| Ag-108m | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -5.12 | 0.7 | 0.001 | 0.999 | (6.0E-03) |
| Am-241 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.7 | 0.001 | 0.999 | (2.0E-06) |
| Am-243+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.7 | 0.001 | 0.999 | (2.0E-06) |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| C-14 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.4 | 0.9 | 0.001 | 0.999 | (1.2E-02) |
| Cm-243 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.9 | 0.001 | 0.999 | (2.0E-06) |
| Co-60 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.7 | 0.001 | 0.999 | (2.0E-03) |
| Cs-134 | P | 2 | D | 1.39E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 1.12E-02 |
| Cs-137+ progeny | P | 2 | D | 1.39E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 1.12E-02 |
| Eu-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | (6.0E-05) |
| Eu-154 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | (6.0E-05) |
| Eu-155 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | (6.0E-05) |
| Fe-55 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -8.11 | 0.7 | 0.001 | 0.999 | (3.0E-04) |
| Gd-152 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | (6.0E-05) |
| H-3 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -4.6 | 0.9 | 0.001 | 0.999 | (1.0E-02) |
| Nb-94 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.12 | 0.7 | 0.001 | 0.999 | (2.0E-06) |
| Ni-63 | P | 2 | D | 3.21E-02 | 75th percentile value (from RESRAD (.mco) file created in the sensitivity analysis (Ref. 3)) | NR | NR | NR | NR | 2.54E-02 |
| Np-237+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -11.51 | 0.7 | 0.001 | 0.999 | (1.0E-05) |
| Pa-231 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 0.9 | 0.001 | 0.999 | (5.0E-06) |
| Pb-210+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -8.11 | 0.9 | 0.001 | 0.999 | (3.0E-04) |
| Pu-238 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.5 | 0.001 | 0.999 | (1.0E-06) |
| Pu-239 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.5 | 0.001 | 0.999 | (1.0E-06) |
| Pu-241+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -13.82 | 0.5 | 0.001 | 0.999 | (1.0E-06) |
| Ra-226+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.5 | 0.001 | 0.999 | (1.0E-03) |
| Sb-125 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -9.72 | 0.9 | 0.001 | 0.999 | (6.0E-05) |
| Sr-90+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.21 | 0.5 | 0.001 | 0.999 | (2.0E-03) |
| Tc-99 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -6.91 | 0.7 | 0.001 | 0.999 | (1.0E-03) |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] 1 | 2 | 3 | 4 | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| Th-229+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 0.9 | 0.001 | 0.999 | (5.0E-06) |
| Th-230 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -12.21 | 0.9 | 0.001 | 0.999 | (5.0E-06) |
| U-233 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.82 | 0.6 | 0.001 | 0.999 | (4.0E-04) |
| U-234 | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.82 | 0.6 | 0.001 | 0.999 | (4.0E-04) |
| U-235+ progeny | P | 2 | S | Truncated Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | -7.82 | 0.6 | 0.001 | 0.999 | (4.0E-04) |
| **Bioaccumulation Factors for Fish (pCi/kg per pCi/l)** | | | | | | | | | | |
| Ac-227+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.7 | 1.1 | NR | NR | 1.5E+01 |
| Ag-108m | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 1.6 | 1.1 | NR | NR | 5.0E+00 |
| Am-241 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Am-243+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| C-14 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 10.8 | 1.1 | NR | NR | 4.9E+04 |
| Cm-243 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Co-60 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.7 | 1.1 | NR | NR | 3.0E+02 |
| Cs-134 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.6 | 0.7 | NR | NR | 2.0E+03 |
| Cs-137+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 7.6 | 0.7 | NR | NR | 2.0E+03 |
| Eu-152 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Eu-154 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Eu-155 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Fe-55 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.3 | 1.1 | NR | NR | 2.0E+02 |
| Gd-152 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.2 | 1.1 | NR | NR | 2.5E+01 |
| H-3 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 0 | 0.1 | NR | NR | 1.0E+00 |
| Nb-94 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.7 | 1.1 | NR | NR | 3.0E+02 |
| Ni-63 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| Np-237+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Pa-231 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| Pb-210+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 5.7 | 1.1 | NR | NR | 3.0E+02 |
| Pu-238 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Pu-239 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Pu-241+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.4 | 1.1 | NR | NR | 3.0E+01 |
| Ra-226+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3.9 | 1.1 | NR | NR | 4.9E+01 |
| Sb-125 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| Sr-90+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.1 | 1.1 | NR | NR | 6.0E+01 |
| Tc-99 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 3 | 1.1 | NR | NR | 2.0E+01 |
| Th-229+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| Th-230 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 4.6 | 1.1 | NR | NR | 9.9E+01 |
| U-233 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| U-234 | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| U-235+ progeny | P | 2 | S | Lognormal-N | NUREG/CR-6697, Att. C (Ref. 2) | 2.3 | 1.1 | NR | NR | 1.0E+01 |
| **Bioaccumulation Factors for Crustacea/ Mollusks (pCi/kg per pCi/l)** | | | | | | | | | | |
| Ac-227+ progeny | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Ag-108m | P | 3 | D | 7.70E+02 | RESRAD Default | NR | NR | NR | NR | |
| Am-241 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Am-243+ progeny | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| C-14 | P | 3 | D | 9.10E+03 | RESRAD Default | NR | NR | NR | NR | |
| Cm-243 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Co-60 | P | 3 | D | 2.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Cs-134 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Cs-137+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Eu-152 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Eu-154 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Eu-155 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| Fe-55 | P | 3 | D | 3.20E+03 | RESRAD Default | NR | NR | NR | NR | |
| Gd-152 | P | 3 | D | 1.00E+03 | RESRAD Default | NR | NR | NR | NR | |
| H-3 | P | 3 | D | 1.00E+00 | RESRAD Default | NR | NR | NR | NR | |

## Input Parameter Values for Soil DCGL Determination
### Resident Farmer Scenario

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Parameters[d] | | | | Mean (Median) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Nb-94 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Ni-63 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Np-237+ progeny | P | 3 | D | 4.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pa-231 | P | 3 | D | 1.10E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pb-210+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pu-238 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pu-239 | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Pu-241+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Ra-226+ progeny | P | 3 | D | 2.50E+02 | RESRAD Default | NR | NR | NR | NR | |
| Sr-90+ progeny | P | 3 | D | 1.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Sb-125 | P | 3 | D | 1.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| Tc-99 | P | 3 | D | 5.00E+00 | RESRAD Default | NR | NR | NR | NR | |
| Th-229+ progeny | P | 3 | D | 5.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| Th-230 | P | 3 | D | 5.00E+02 | RESRAD Default | NR | NR | NR | NR | |
| U-233 | P | 3 | D | 6.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| U-234 | P | 3 | D | 6.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| U-235+ progeny | P | 3 | D | 6.00E+01 | RESRAD Default | NR | NR | NR | NR | |
| **Graphics Parameters** | | | | | | | | | | |
| Number of points | | | | 32 | RESRAD Default | NR | NR | NR | NR | |
| Spacing | | | | log | RESRAD Default | NR | NR | NR | NR | |
| **Time Integration Parameter** | | | | | | | | | | |
| Maximum number of points for dose | | | | 17 | RESRAD Default | NR | NR | NR | NR | |

Notes:

[a] P = physical, B = behavioral, M = metabolic; (see NUREG/CR-6697, Attachment B, Table 4.)
[b] 1 = high-priority parameter, 2 = medium-priority parameter, 3 = low-priority parameter (see NUREG/CR-6697, Attachment B, Table 4.1)
[c] D = deterministic, S = stochastic

[d] Distributions Statistical Parameters:
Lognormal-N: 1= mean, 2 = standard deviation
Bounded Lognormal-N: 1= mean, 2 = standard deviation, 3 = minimum, 4 = maximum
Truncated Lognormal-N: 1= mean, 2 = standard deviation, 3 = lower quantile, 4 = upper quantile
Bounded normal: 1 = mean, 2 = standard deviation, 3 = minimum, 4 = maximum
Beta: 1 = minimum, 2 = maximum, 3 = P-value, 4 = Q-value
Triangular: 1 = minimum, 2 = mode, 3 = maximum
Uniform: 1 = minimum, 2 = maximum
NR = Not required

Additional Sensitivity Analysis Data:
Sampling technique = Latin Hypercube
Number of observations =2000
Number of repetitions = 1

Input Rank Correlation Coefficients for situation where distributions remain for both parameters:
Thickness of contaminated zone and unsaturated zone = - 0.99
Total porosity and bulk density = - 0.99 (contaminated zone, unsaturated and saturated zones)
Total porosity and effective porosity = 0.96 (unsaturated and saturated zones)
Effective porosity and bulk density = -0.99 (unsaturated and saturated zones)
Well Pumping Rate and Irrigation Rate = 0.96

**References**

1. Code of Federal Regulations, Title10, Section 20.1402, "Radiological Criteria for Unrestricted Use".

2. NUREG/CR-6697, "Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes", Yu, C. et al., US Department of Energy-Argonne National Laboratory, November 2000.

3. YA-CALC-01-001-03, "RESRAD 6.21 Sensitivity Analysis for Resident Farmer Scenario - Soil," December 2003

4. YA-REPT-00-008-03, "Evaluation of GeoTesting Express Soil Testing and Determination of Depth to Groundwater," December 2003.

5. Yu, C., et al, Argonne National Laboratory, "Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil," April 1993.

6. NUREG/CR-5512, "Residual Radioactive Contamination From Decommissioning," Volume 3: "Parameter Analysis, Draft Report for Comment," October 1999.

7. Eckerman, K.F., et al., "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," EPA-520/1-88-020, Federal Guidance Report No. 11 (FGR-11), U.S. EPA, 1988.

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# Appendix 6E

## Soil DCGL Results

# Soil DCGL Results

| Nuclide | Dose Conversion Factor (DCF) (mrem/y per pCi/g) | DCGL (pCi/g) |
|---|---|---|
| H-3 | 6.79E-02 | 3.7E+02 |
| C-14 | 4.52E+00 | 5.5E+00 |
| Fe-55 | 8.57E-04 | 2.9E+04 |
| Co-60 | 6.21E+00 | 4.0E+00 |
| Ni-63 | 3.07E-02 | 8.1E+02 |
| Sr-90 | 1.45E+01 | 1.7E+00 |
| Nb-94 | 3.46E+00 | 7.2E+00 |
| Tc-99 | 1.76E+00 | 1.4E+01 |
| Ag-108m | 3.44E+00 | 7.3E+00 |
| Sb-125 | 7.82E-01 | 3.2E+01 |
| Cs-134 | 5.02E+00 | 5.0E+00 |
| Cs-137 | 2.92E+00 | 8.6E+00 |
| Eu-152 | 2.43E+00 | 1.0E+01 |
| Eu-154 | 2.63E+00 | 9.5E+00 |
| Eu-155 | 6.29E-02 | 4.0E+02 |
| Pu-238 | 7.48E-01 | 3.3E+01 |
| Pu-239 | 8.30E-01 | 3.0E+01 |
| Pu-241 | 2.54E-02 | 9.8E+02 |
| Am-241 | 8.59E-01 | 2.9E+01 |
| Cm-243 | 7.85E-01 | 3.2E+01 |

# Appendix 6F

## Basis Document for Site-Specific Parameter Value Assignment, Building Occupancy

**Table of Contents**

Page

1. Room Dimensions ..... 6F-3
2. Source Configuration ..... 6F-6
3. Direct Ingestion Rate ..... 6F-7

1. Room Dimension

An inventory of the rooms and partial rooms that would remain on site following Phase I of the DEMCO demolition project (Ref. 1) was used to determine room dimensions. Wall dimensions were determined from site drawings showing the building locations, building elevations and dimensions. Ceilings were not included in the model, as partial rooms remaining at the time of license termination will either have no ceiling or will be covered with a ceiling constructed of new, uncontaminated building material.

The average wall dimensions (wall length and height) were calculated using data describing the walls expected to remain at the time of final status survey. One wall was excluded from the data set: the 40.5 m long Primary Auxiliary Building (PAB) south wall. This wall extends the entire length of the PAB and was excluded from the data set because it is atypical of a standard room. The data on the walls expected to remain at the time of final status survey and the calculated average wall dimensions are shown in Table 1-1. The portion of the room expected to remain at the time of final status survey is highlighted. The resulting average wall length is 4.44 m, and the average wall height is 3.51 m.

These average wall dimensions were used to calculate the floor surface area (meters$^2$) for the modeled room:

$$\text{Floor surface area} = (4.44\ \text{m}) \times (4.44\ \text{m}) = 19.71\ \text{m}^2$$

The wall surface area in square meters was calculated from the average wall length and height in meters for the modeled room:

$$\text{Wall area} = (4.44\ \text{m}) \times (3.51\ \text{m}) = 15.58\ \text{m}^2$$

The floor and wall surface areas and the average wall length and height were used as inputs to the RESRAD-BUILD v 3.21 code to define the room model and to locate the receptor.

**Tab;e 1- 1**
**Remaining Room/Walls Dimensions**

| Building | Area | Width | | Length | | Height | |
|---|---|---|---|---|---|---|---|
| | | Ft/in | Meters | Ft/in | Meters | Ft/in | Meters |
| PAB | TK-30 in (PAB Basement) Room | 12'-6" | 3.81E+00 | 15'-6" | 4.72E+00 | 18'-6" | 5.64E+00 |
| PAB | TK-27 (PAB Basement) Room | 10'-2" | 3.10E+00 | 15'-6" | 4.72E+00 | 18'-6" | 5.64E+00 |
| PAB | South Wall (G-Line) | | | 133'-0"* | 4.05E+01 | 13'-0" | 3.96E+00 |
| PAB | East Wall (2-Line to Fa) | | | 17'-0" | 5.18E+00 | 13'-0" | 3.96E+00 |
| | | | | | | | |
| I-X PIT | Southernmost Wall | | | 33'-0" | 1.01E+01 | 14'-8" | 4.47E+00 |
| | | | | | | | |
| I-X PIT | Easternmost Wall (Total Length) | | | 31'-10" | 9.70E+00 | 14'-8" | 4.47E+00 |
| | | | | | | | |
| SFP | Spent Fuel Pool | 16'-6" | 5.03E+00 | 33'-8" | 1.03E+01 | 14'-8" | 4.47E+00 |
| | | | | | | | |
| New Fuel Vault | New Fuel Storage (South Wall) | | | 15'-0" | 4.57E+00 | 13'-6" | 4.11E+00 |
| | | | | | | | |
| Safe Shutdown | Pipe Chase Cubicle | 4'-0" | 1.22E+00 | 4'-0" | 1.22E+00 | 8'-0" | 2.44E+00 |
| | | | | | | | |
| Waste Vault | Waste Transfer Pit Cubicle | 9'-0" | 2.74E+00 | 14'-0" | 4.27E+00 | 9'-10" | 3.00E+00 |
| | | | | | | | |
| Elevator Pit | Elevator Pit Cubicle | 7'-10" | 2.39E+00 | 9'-0" | 2.74E+00 | 6'-6" | 1.98E+00 |
| | | | | | | | |
| Waste Disposal | Pipe Chase Cubicle | 5'-0" | 1.52E+00 | 11'-10" | 3.61E+00 | 10'-1" | 3.07E+00 |
| Waste Disposal | Distillate Heat Exchanger Cubicle | 9'-0" | 2.74E+00 | 16'-0" | 4.88E+00 | 7'-0" | 2.13E+00 |
| Waste Disposal | Evaporator Cubicle | 10'-6" | 3.20E+00 | 16'-0" | 4.88E+00 | 7'-0" | 2.13E+00 |
| Waste Disposal | Drumming Pit Cubicle | 10'-4" | 3.15E+00 | 27'-0" | 8.23E+00 | 7'-0" | 2.13E+00 |
| | | | | | | | |
| PAB | PAB Back Stairwell Pit Cubicle | 11'-4" | 3.45E+00 | 13'-0" | 3.96E+00 | 8'-2" | 2.49E+00 |
| | | | | | | | |
| **Average Wall Length (meters) = 4.44E+00** | | | | | | | |
| **Average Wall Height (meters) = 3.51E+00** | | | | | | | |

* As previously noted, the south (G-Line) wall of the PAB is excluded from the calculation of average wall length.

**Table 1-2**
**Remaining Structures and Drawing Reference**

| Building | Room/Wall/Pit | Room/Wall Width | Drawing Reference | Wall Length | Drawing Reference | Wall Height (Note 1) | Drawing Reference |
|---|---|---|---|---|---|---|---|
| PAB | Drain Collecting Tank Room (TK-30) | 12' 6" | PAB 9699-FC-40D | 15' 6" | PAB 9699-RC-40A | 1022' 8"-1004' 2"=18' 6" | PAB 9699-FM-57A |
| PAB | Gravity Drain Tank Room (TK-27) | 10' 2" | PAB 9699-FC-40D | 15' 6" | PAB 9699-RC-40A | 1022' 8"-1004' 2"=18' 6" | PAB 9699-FM-57A |
| PAB | South Wall (G-Line) | | | 133' 0" | PAB 9699-FR-16A | 1035' 8" - 1022' 8" =13' 0" | PAB 9699-FM-57A |
| PAB | East Wall (2-Line to Fa) | | | 17' 0" | PAB 9699-FR-16A | 1035' 8" - 1022' 8" =13' 0" | PAB 9699-FM-57A |
| | | | | | | | |
| I-X PIT | Southernmost Wall | | | 33' 0" | I-X Pit 9699-FM-35B | 1035' 8" - 1021' 0" =14' 8" | I-X Pit 9699-FM-35B |
| | | | | | | | |
| I-X PIT | Easternmost Wall F to E | | | 25' 6" | PAB 9699-FM-57A | 1035' 8" - 1021' 0" =14' 8" | I-X Pit 9699-FM-35B |
| I-X PIT | Easternmost Wall E to Wall End | | | 6'4" | I-X Pit 9699-FM-35B | | |
| I-X PIT | Easternmost Wall (Total Length) | | | 31' 10" | | | |
| | | | | | | | |
| SFP | Spent Fuel Pool | 16' 6" | Fuel Pit 9699-FM-21A | 33' 8" | Fuel Pit 9699-FM-21A | 1022' 8" - 1008' 0" =14' 8" | Fuel Pit 9699-FC-45B |
| | | | | | | | |
| New Fuel Vault | New Fuel Storage (South Wall) | | | 15' 0" | PAB 9699-FM-57A | 1035' 0" - 1021' 6" =13' 6" | Fuel Pit 9699-FM-21A |
| | | | | | | | |
| Safe Shutdown | Pipe Chase (555) | 4' 0" | CES Rev.1 85005-F-1001 | 4' 0" | CES Rev.1 85005-F-1001 | 1034' 0" - 1026' 0" = 8' 0" | CES Rev.1 85005-F-1001 |
| | | | | | | | |
| Waste Vault | Waste Transfer Pump Pit (underground) | 9' 0" | 9699-FC-50C | 14' 0" | 9699-FC-50C | 1020' 6" - 1010' 8" =9' 10" | 9699-FC-50C |
| | | | | | | | |
| Elevator Pit | Elevator Pit | 7' 10" | PAB 9699-FC-43A | 9' 0" | PAB 9699-FC-43A | 1022' 8' - 1016' 2" =6' 6" | PAB 9699-FC-43A |
| | | | | | | | |
| Waste Disposal | Pipe Chase Cubicle | 5' 0" | Waste Disp.9699-FA-17A | 11' 10" | Waste Disp.9699-FA-17A | 1035' 8" - 1025' 7" = 10' 1" | Waste Disp.9699-FA-17A |
| Waste Disposal | Distillate Heat Exchanger Cubicle | 9' 0" | Waste Disp.9699-FA-17A | 16' 0" | Waste Disp.9699-FA-17A | 1035' 8" - 1028' 8" = 7' 0" | Waste Disp.9699-FA-17A |
| Waste Disposal | Evaporator Cubicle | 10' 6" | Waste Disp.9699-FA-17A | 16' 0' | Waste Disp.9699-FA-17A | 1035' 8" - 1028' 8" = 7' 0" | Waste Disp.9699-FA-17A |
| Waste Disposal | Drumming Pit Cubicle | 10' 4" | Waste Disp.9699-FA-17A | 27' 0" | Waste Disp.9699-FA-17A | 1035' 8" - 1028' 8" = 7' 0" | Waste Disp.9699-FA-17A |
| | | | | | | | |
| PAB | Back of PAB Stairwell Pit Cubicle | 11' 4" | PAB 9699 RC-40B | 13' 0" | PAB 9699 RC-40B | 1035' 8" - 1027' 6' = 8' 2" | PAB 9699-FM-57B |
| | | | | | | | |

**Note 1:** Top/ceiling height elevation is from DEMCO work scope Ref. 1

2. Source Configuration

NUREG/CR-6755 (Ref. 2), Section 4.1, describes three principal assumptions inherent in the Building Occupancy scenario: a fixed room area, uniform surface contamination, and the receptor location at the center of the floor at a height of 1 m. The configuration of the receptor and sources is illustrated in Figure 2-1. The RESRAD- BUILD input parameters, receptor location and center of source coordinates, are provided in Table 2-1.

**Figure 2-1**
**Configuration of Source and Receptor Locations**
**for RESRAD-BUILD Model**

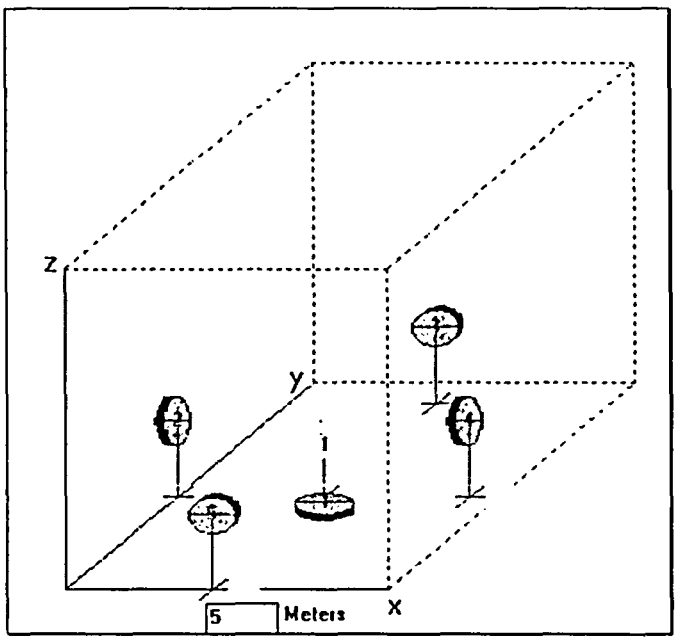


**Table 2-1**
**Receptor and Center of Source Locations, meters**

| Source # | Source Description | Axis | | |
|---|---|---|---|---|
| | | X | Y | Z |
| | | | | |
| 1 | Floor | 2.22 | 2.22 | 0 |
| 2 | West Wall | 0 | 2.22 | 1.76 |
| 3 | North Wall | 2.22 | 4.44 | 1.76 |
| 4 | East Wall | 4.44 | 2.22 | 1.76 |
| 5 | South Wall | 2.22 | 0 | 1.76 |
| | Receptor Location | 2.22 | 2.22 | 1 |

3. Direct Ingestion Rate

The source specific input parameter, Direct Ingestion Rate, is described in RESRAD-BUILD as the direct ingestion rate of the source by any receptor in the room. Direct ingestion is possible only if the receptor and the source are in the same room and represents the fraction of the source ingested per hour.

NUREG/CR-5512, Volume 3, (Ref. 3) defines the average ingestion rate of 1.1E-4 $m^2$/hr as representative for the average individual in an industrial setting. The Direct Ingestion Rate for use in the Building Occupancy Scenario is calculated based upon the total room surface area (source area). The surface area is equal to sum of the surface area of four walls (15.58 $m^2$ per wall, as discussed in Section 1) plus the surface area of the floor (19.71 $m^2$, as discussed in Section 1).

Direct Ingestion Rate = Average Ingestion Rate / Source Area
= (1.1E-04 $m^2$/hr) / ((4 x 15.58 $m^2$) + 19.71 $m^2$)
= (1.1E-04 $m^2$/hr) / (82.03 $m^2$)
= 1.34E-06 $hr^{-1}$

The direct ingestion defined in this manner used in conjunction with an indirect ingestion rate set to zero, adequately models the Building Occupancy Ingestion pathway.

References:

1 Attachment E to the "Contract for the Performance of Demolition and Disposal and Related Services, By and Between DEMCO, Inc. and Yankee Atomic Electric Company," dated February 28, 2003.

2. NUREG/CR-6755, "Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code," February. 2002 (ANL/EAD/TM/02-1).

3. NUREG/CR-5512, "Residual Radioactive Contamination from Decommissioning," Volume 3: "Parameter Analysis, Draft Report for Comment," October 1999 (SAND99-2148).

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# Appendix 6G

## Input Parameter Values for Sensitivity Analysis, Building Occupancy

## Input Parameter Values for Sensitivity Analysis, Building Occupancy

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Paramters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| General | | | | | | | | | | |
| Exposure Duration (days) | B | 3 | D | 365.25 | NUREG/CR-5512 (Ref. 1), Vol.3, Section 5.2.1 | NR | NR | NR | NR | NR |
| Indoor Fraction | B | 2 | D | 0.267 | NUREG/CR-5512 (Ref. 1), Vol. 3, Section 5.2.2 | NR | NR | NR | NR | NR |
| Evaluation Time (year) | P | 3 | D | 0 | t=0 corresponds maximum dose over the first year | NR | NR | NR | NR | NR |
| Number of Rooms | P | 3 | D | 1 | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Deposition Velocity (m/sec) | P | 2 | S | Loguniform | NUREG/CR-6755 (Ref. 2), Section 3.3 | 2.70E-06 | 2.70E-03 | - | - | - |
| Resuspension Rate ($sec^{-1}$) | P | 1 | S | Loguniform | NUREG/CR-6755 (Ref. 2), Section 3.1 | 2.5E-11 | 1.35E-5 | - | - | - |
| Air exchange rate for room (1/ h) | B | 2 | D | 1.52 | NUREG/CR-6697 (Ref. 3), Att. C, 7.4 and NUREG/CR-6755 (Ref. 2), Section 3.2 | NR | NR | NR | NR | NR |
| Room area ($m^2$) | P | 2 | D | 19.71 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Room height (m) | P | 2 | D | 3.51 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Time fraction | B | 3 | D | 1 | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Breathing rate ($m^3$/day) | B | 2 | D | 33.6 | NUREG/CR-5512 (Ref. 1) Vol. 3 Section 5.3 | NR | NR | NR | NR | NR |
| Indirect ingestion rate ($m^2$/hr) | B | 2 | D | 0 | NUREG/CR-5512 (Ref. 1) Vol. 3 Section 5.2.3 Indirect ingestion is not modeled | NR | NR | NR | NR | NR |
| Receptor location: x,y,z (m) | B | 3 | D | 2.22, 2.22, 1 | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Shielding thickness (cm) | P | 2 | D | 0 | No shielding assumed | NR | NR | NR | NR | NR |
| Shielding density (g/cc) | P | 1 | D | 0 | No shielding assumed | NR | NR | NR | NR | NR |
| Shielding material | P | 3 | D | None | No shielding assumed | NR | NR | NR | NR | NR |
| Number of sources | P | 3 | D | 5 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| External dose conversion factor ((mrem/yr)/(dpm/$m^2$)) | M | 3 | D | RESRAD-BUILD default | FGR-12 (Ref. 4) | NR | NR | NR | NR | NR |
| Air submersion dose conversion factor ((mrem/yr)/(pCi/$m^3$)) | M | 3 | D | RESRAD-BUILD default | FGR-12 (Ref. 4) | NR | NR | NR | NR | NR |
| Inhalation dose conversion factor (mrem/pCi/g) | M | 3 | D | RESRAD-BUILD default | FGR-11 (Ref. 5) | NR | NR | NR | NR | NR |

## Input Parameter Values for Sensitivity Analysis, Building Occupancy

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Paramters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Ingestion dose conversion factor (mrem/pCi/g) | M | 3 | D | RESRAD-BUILD default | FGR-11 (Ref. 5) | NR | NR | NR | NR | NR |
| **Source 1. Floor** | | | | | | | | | | |
| Type | P | 3 | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | 3 | D | Z | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | 3 | D | 2.22, 2.22, 0 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area (m2) | P | 2 | D | 19.71 | Site-specific model, LTP App.6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | 2 | D | 1 | NUREG/CR-6697 (Ref. 3), Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | 2 | D | 0.07 | NUREG/CR-6697 (Ref. 3), Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion ($hr^{-1}$) | B | 2 | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1), Vol. 3, Section 5.2.3 and LTP App. 6F, Section 3 (1.1E-04$m^2$/h / 82.03 $m^2$) | NR | NR | NR | NR | NR |
| Removable fraction | P | 1 | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), Section 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (days) | P | 2 | S | Triangular | NUREG/CR-6755 (Ref. 2), Section 3.6 | 1000 | 100000 | 10000 | - | - |
| Radionuclide concentration (pCi/$m^2$) | P | 2 | D | 1 | Assumes unit concentration | NR | NR | NR | NR | NR |
| **Source 2. West Wall** | | | | | | | | | | |
| Type | P | 3 | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | 3 | D | X | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | 3 | D | 0, 2.22, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area (m2) | P | 2 | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | 2 | D | 1 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | 2 | D | 0.07 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |

## Input Parameter Values for Sensitivity Analysis, Building Occupancy

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Paramters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Direct ingestion (hr-1) | B | 2 | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1) Vol. 3, Section 5.2.3 and LTP App. 6F, Section 3 (1.1E-04m²/h / 82.03 m²) | NR | NR | NR | NR | NR |
| Removable fraction | P | 1 | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (days) | P | 2 | S | Triangular | NUREG/CR-6755 (Ref. 2), 3.6 and NUREG/CR- 6697 (Ref. 3) | 1000 | 100000 | 10000 | - | - |
| Radionuclide concentration (pCi/m²) | P | 2 | D | 1 | Allows for proportional DCGL calculation | NR | NR | NR | NR | NR |
| **Source 3. North Wall** | | | | | | | | | | |
| Type | P | 3 | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | 3 | D | Y | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | 3 | D | 2.22, 4.44, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area (m2) | P | 2 | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | 2 | D | 1 | NUREG/CR-6697 (Ref. 3) Att. C, 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | 2 | D | 0.07 | NUREG/CR-6697 (Ref. 3) Att. C, 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion (hr-1) | B | 2 | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1) Vol. 3,5.2.3 1.1E-04m²/h / 82.03m² | NR | NR | NR | NR | NR |
| Removable fraction | P | 1 | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (days) | P | 2 | S | Triangular | NUREG/CR-6755 (Ref. 2), 3.6 and NUREG/CR- 6697 (Ref. 3) | 1000 | 100000 | 10000 | - | - |
| Radionuclide concentration (pCi/m²) | P | 2 | D | 1 | Allows for proportional DCGL calculation | NR | NR | NR | NR | NR |
| **Source 4. East Wall** | | | | | | | | | | |
| Type | P | 3 | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | 3 | D | X | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | 3 | D | 4.44, 2.22, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |

## Input Parameter Values for Sensitivity Analysis, Building Occupancy

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Paramters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Area (m2) | P | 2 | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | 2 | D | 1 | NUREG/CR-6697 (Ref. 3), Att. C, 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | 2 | D | 0.07 | NUREG/CR-6697 (Ref. 3), Att. C, 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion (hr-1) | B | 2 | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1),Vol. 3, Section 5.2.3 and LTP App. 6F, Section 3 ($1.1E\text{-}04 m^2/h$ / $82.03 m^2$) | NR | NR | NR | NR | NR |
| Removable fraction | P | 1 | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (days) | P | 2 | S | Triangular | NUREG/CR-6755 (Ref. 2), 3.6 and NUREG/CR- 6697 | 1000 | 100000 | 10000 | - | - |
| Radionuclide concentration ($pCi/m^3$) | P | 2 | D | 1 | Allows for proportional DCGL calculation | NR | NR | NR | NR | NR |
| **Source 5. South Wall** | | | | | | | | | | |
| Type | P | 3 | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | 3 | D | Y | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | 3 | D | 2.22, 0, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area (m2) | P | 2 | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | 2 | D | 1 | NUREG/CR-6697 (Ref. 3) Att. C, 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | 2 | D | 0.07 | NUREG/CR-6697 (Ref. 3) Att. C, 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion (hr-1) | B | 2 | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1), Vol. 3, Section 5.2.3 and LTP App. 6F, Section 3 ($1.1E\text{-}04 m^2/h$ / $82.03 m^2$) | NR | NR | NR | NR | NR |
| Removable fraction | P | 1 | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (days) | P | 2 | S | Triangular | NUREG/CR-6755 (Ref. 2). 3.6 and NUREG/CR- 6697 (Ref. 3) | 1000 | 100000 | 10000 | - | - |

## Input Parameter Values for Sensitivity Analysis, Building Occupancy

| Parameter (unit) | Type[a] | Priority[b] | Treatment[c] | Value/Distribution | Basis | Distribution's Statistical Paramters[d] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Radionuclide concentration ($pCi/m^2$) | P | 2 | D | 1 | Allows for proportional DCGL calculation | NR | NR | NR | NR | NR |

Notes:

[a] P = physical, B = behavioral, M = metabolic (NUREG/CR-6697, Att. B, Table 4.3)
[b] 1 = high priority parameter, 2 = medium priority parameter, 3 = low priority parameter (NUREG/CR-6697, Att. B, Table 4.3)
[c] D = deterministic, S = stochastic
[d] Statistical Parameters
Loguniform 1 = minimum, 2 = maximum
Triangular 1 = minimum, 2 = maximum, 3 = most likely
NR = Not required

Input Correlations: Resuspension Rate and Deposition Velocity = 0.9
Time to Source Removal = 0.9 (correlation set between sources)

Run Specifications: Random seed = 1000
Number of observations = 300
Number of repetitions = 1
Dose integrations = 5

References:

1. NUREG/CR-5512, "Residual Radioactive Contamination from Decommissioning," Volume 3: "Parameter Analysis, Draft Report for Comment," October 1999 (SAND99-2148).

2. NUREG/CR-6755, "Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code," February. 2002 (ANL/EAD/TM/02-1).

3. NUREG/CR-6697,"Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes," November 2000, (ANL/EAD/TM-98).

4. Eckerman, K.F., et al, "External Exposure to Radionuclides In Air, Water, And Soil," EPA 402-R-93-081, Federal Guidance Report No. 12 (FGR-12), U.S. EPA, 1993.

5. Eckerman, K.F., et al., "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," EPA-520/1-88-020, Federal Guidance Report No. 11 (FGR-11), U.S. EPA, 1988.

6. NUREG-1727, "NMSS Decommissioning Standard Review Plan," September 2000.

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# Appendix 6H

## Results of Sensitivity Analysis, Building Occupancy

## Results of Sensitivity Analysis, Building Occupancy (Based on the Partial Rank Correlation Coefficient)

| Radionuclide | Rank 1 parameter | Rank 2 parameter | Rank 3 parameter | Rank 4 parameter | Rank 5 parameter | Rank 6 parameter | Rank 7 parameter |
|---|---|---|---|---|---|---|---|
| H-3 | RFO(1) -0.85 | RFO(2) -0.78 | RFO(4) -0.78 | RFO(5) -0.76 | RFO(3) -0.76 | DKSUS 0.35 | UD -0.31 |
| C-14 | RFO(1) 0.89 | RFO(4) 0.85 | RFO(3) 0.84 | RFO(5) 0.82 | RFO(2) 0.82 | -- | -- |
| Fe-55 | RFO(3) 0.28 | RFO(1) 0.28 | RFO(4) 0.27 | RFO(5) 0.23 | DKSUS 0.23 | UD -0.21 | RFO(2) 0.15 |
| Co-60 | RFO(1) 0.45 | RFO(5) 0.16 | DKSUS -0.14 | RFO(2) 0.13 | UD 0.13 | RFO(4) 0.10 | -- |
| Ni-63 | RFO(1) - 0.64 | RFO(3) -0.58 | RFO(5) -0.58 | RFO(2) -0.58 | RFO(4) -0.58 | DKSUS 0.12 | -- |
| Sr-90 | RFO(1) - 0.71 | RFO(4) -0.59 | RFO(2) -0.56 | RFO(5) -0.56 | RFO(3) -0.52 | DKSUS 0.37 | UD -0.30 |
| Nb-94 | DKSUS -0.38 | UD 0.25 | RFO(1) 0.24 | -- | -- | -- | -- |
| Tc-99 | RFO(1) 0.40 | RFO(4) 0.34 | RFO(2) 0.29 | RFO(3) 0.27 | RFO(5) 0.26 | -- | -- |
| Ag-108m | RFO(1) 0.50 | DKSUS -0.49 | UD 0.41 | RFO(4) 0.13 | RFO(5) -0.10 | -- | -- |
| Sb-125 | RFO(1) 0.65 | RFO(4) 0.38 | RFO(3) 0.32 | UD 0.26 | DKSUS -0.25 | RFO(2) 0.20 | RFO(5) 0.16 |
| Cs-134 | RFO(1) 0.37 | RFO(4) 0.20 | RFO(2) 0.16 | RFO(5) 0.15 | RFO(3) 0.14 | UD 0.12 | DKSUS -0.11 |
| Cs-137 | RFO(1) 0.81 | RFO(5) 0.59 | RFO(3) 0.59 | RFO(4) 0.57 | RFO(2) 0.54 | DKSUS -0.48 | UD 0.43 |
| Eu-152 | RFO(1) 0.24 | RFO(5) 0.11 | -- | -- | -- | -- | -- |
| Eu-154 | RFO(1) 0.42 | DKSUS -0.20 | UD 0.17 | RFO(2) 0.13 | -- | -- | -- |
| Eu-155 | RFO(4) -0.48 | RFO(5) -0.46 | RFO(3) -0.44 | RFO(2) -0.43 | RFO(1) 0.19 | -- | -- |
| Pu-238 | RFO(1) -0.91 | RFO(4) -0.87 | RFO(3) -0.86 | RFO(5) -0.85 | RFO(2) -0.85 | DKSUS 0.11 | -- |
| Pu-239 | RFO(1) -0.91 | RFO(4) -0.87 | RFO(3) -0.86 | RFO(5) -0.85 | RFO(2) -0.85 | -- | -- |
| Pu-241 | DKSUS 0.60 | UD -0.54 | RFO(2) -0.14 | RFO(1) -0.13 | RFO(4) -0.13 | -- | -- |
| Am-241 | RFO(1) -0.91 | RFO(4) -0.87 | RFO(3) -0.86 | RFO(5) -0.85 | RFO(2) -0.85 | -- | -- |
| Cm-243 | RFO(1) -0.91 | RFO(4) -0.86 | RFO(3) -0.85 | RFO(5) -0.85 | RFO(2) -0.84 | DKSUS 0.22 | UD -0.17 |

Parameter Definition:

DKSUS = Resuspension Rate

UD = Deposition Velocity

RFO(#) = Time for Source Removal, where # represents the source number delineated as follow: 1=floor, 2=-west wall, 3=north wall, 4=east wall, 5=south wall

# Appendix 6I

## Input Parameter Values for Building Occupancy DCGL Determination

**Input Parameters for Building Occupancy DCGL Determination**

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| General | | | | | | | | | | |
| Exposure Duration (days) | B | All | D | 365.25 | NUREG/CR-5512 (Ref. 1), Vol.3, 5.2.1 | NR | NR | NR | NR | NR |
| Indoor Fraction | B | All | D | 0.267 | NUREG/CR-5512 (Ref. 1), Vol. 3, 5.2.2 | NR | NR | NR | NR | NR |
| Evaluation Time (year) | P | All | D | 0 | t=0 corresponds maximum dose over the first year (year 9 for Pu-241) | NR | NR | NR | NR | NR |
| Number of Rooms | P | All | D | 1 | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Deposition Velocity (m/sec) | P | H-3 | D | 1.51E-05 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Fe-55 | D | 1.51E-05 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Co-60 | D | 4.79E-04 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Sr-90 | D | 1.51E-05 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Nb-94 | D | 4.79E-04 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Ag-108m | D | 4.79E-04 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Sb-125 | D | 4.79E-04 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Cs-134 | D | 4.79E-04 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Cs-137 | D | 4.79E-04 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Eu-154 | D | 4.79E-04 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |

## Input Parameters for Building Occupancy DCGL Determination

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Pu-241 | D | 1.51E-05 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Cm-243 | D | 1.51E-05 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | All others | S | Loguniform | NUREG/CR-6755 (Ref. 2), Section 3.3 | 2.70E-06 | 2.70E-03 | - | - | 8.53E-05 |
| Resuspension Rate ($sec^{-1}$) | P | H-3 | D | 1.02E-06 | Mean value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Fe-55 | D | 1.02E-06 | Mean value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Co-60 | D | 6.75E-10 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Ni-63 | D | 1.02E-06 | Mean value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Sr-90 | D | 1.02E-06 | Mean value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Nb-94 | D | 6.75E-10 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Ag-108 | D | 6.75E-10 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Sb-125 | D | 6.75E-10 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Cs-134 | D | 6.75E-10 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Cs-137 | D | 6.75E-10 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Eu-154 | D | 6.75E-10 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Pu-238 | D | 1.02E-06 | Mean value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | Pu-241 | D | 1.02E-06 | Mean value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |

**Input Parameters for Building Occupancy DCGL Determination**

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Cm-243 | D | 1.02E-06 | Mean value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | - | - | - |
| | P | All others | S | Loguniform | NUREG/CR-6755 (Ref. 2), 3.1 | 2.5E-11 | 1.3E-5 | - | - | 1.83E-08 |
| Air exchange rate for room ($hr^{-1}$) | B | All | D | 1.52 | NUREG/CR-6697 (Ref. 3), Att.C, Section 7.4 and NUREG/CR-6755 (Ref. 2), Section 3.2 | NR | NR | NR | NR | NR |
| Room area ($m^2$) | P | All | D | 19.71 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Room height (m) | P | All | D | 3.51 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Time fraction | B | All | D | 1 | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Breathing rate ($m^3$/day) | B | All | D | 33.6 | NUREG/CR-5512 (Ref. 1) Vol. 3 Section 5.3 | NR | NR | NR | NR | NR |
| Indirect ingestion rate ($m^2$/hr) | B | All | D | 0 | NUREG/CR-5512 (Ref. 1) Vol. 3 Section 5.2.3 Indirect ingestion is not modeled | NR | NR | NR | NR | NR |
| Receptor location: x,y,z (m) | B | All | D | 2.22, 2.22, 1 | NUREG/CR-5512 (Ref. 1) and LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Shielding thickness (cm) | P | All | D | 0 | No shielding assumed | NR | NR | NR | NR | NR |
| Shielding density (g/cc) | P | All | D | 0 | No shielding assumed | NR | NR | NR | NR | NR |
| Shielding material | P | All | D | None | No shielding assumed | NR | NR | NR | NR | NR |
| Number of sources | P | All | D | 5 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| External dose conversion factor ((mrem/yr)/(dpm/$m^2$)) | M | All | D | RESRAD-BUILD default | FGR-12 (Ref. 4) | NR | NR | NR | NR | NR |
| Air submersion dose conversion factor ((mrem/yr)/(pCi/$m^3$)) | M | All | D | RESRAD-BUILD default | FGR-12 (Ref. 4) | NR | NR | NR | NR | NR |
| Inhalation dose conversion factor (mrem/pCi/g) | M | All | D | RESRAD-BUILD default | FGR-11 (Ref. 5) | NR | NR | NR | NR | NR |
| Ingestion dose conversion factor (mrem/pCi/g) | M | All | D | RESRAD-BUILD default | FGR-11 (Ref. 5) | NR | NR | NR | NR | NR |
| **Source 1, Floor** | | | | | | | | | | |
| Type | P | All | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | All | D | Z | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | All | D | 2.22, 2.22, 0 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |

## Input Parameters for Building Occupancy DCGL Determination

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| Area ($m^2$) | P | All | D | 19.71 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | All | D | 1 | NUREG/CR-6697 (Ref. 3), Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | All | D | 0.07 | NUREG/CR-6697 (Ref. 3), Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion ($hr^{-1}$) | B | All | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1), Vol. 3, Section 5.2.3 and LTP App. 6F, Section 3 (1.1E-04$m^2$/h / 82.03 $m^2$) | NR | NR | NR | NR | NR |
| Removable fraction | P | All | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), Section 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (days) | P | H-3 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | C-14 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Fe-55 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Co-60 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ni-63 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sr-90 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Nb-94 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Tc-99 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

| Input Parameters for Building Occupancy DCGL Determination | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Ag-108m | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sb-125 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-134 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-137 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-152 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-154 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-155 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-238 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-239 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Am-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cm-243 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| Radionuclide concentration (pCi/m$^2$) | P | All | D | 1 | Assumed unit concentration | NR | NR | NR | NR | NR |

| Input Parameters for Building Occupancy DCGL Determination | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
| | | | | | | 1 | 2 | 3 | 4 | |
| **Source 2. West Wall** | | | | | | | | | | |
| Type | P | All | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | All | D | X | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | All | D | 0, 2.22, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area ($m^2$) | P | All | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | All | D | 1 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | All | D | 0.07 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion ($hr^{-1}$) | B | All | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1) Vol. 3, Section 5.2.3 and LTP App. 6F, Section 3 (1.1E-04$m^2$/h / 82.03$m^2$) | NR | NR | NR | NR | NR |
| Removable fraction | P | All | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), Section 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (d) | P | H-3 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | C-14 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Fe-55 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Co-60 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ni-63 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sr-90 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

| Input Parameters for Building Occupancy DCGL Determination | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Nb-94 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Tc-99 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ag-108m | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sb-125 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-134 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-137 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-152 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-154 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-155 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-238 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-239 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Am-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

| Input Parameters for Building Occupancy DCGL Determination | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Cm-243 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| Radionuclide concentration (pCi/m²) | P | All | D | 1 | Assumed unit concentration | NR | NR | NR | NR | NR |
| **Source 3: North Wall** | | | | | | | | | | |
| Type | P | All | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | All | D | Y | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | All | D | 2.22, 4.44, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area (m2) | P | All | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | All | D | 1 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | All | D | 0.07 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion ($hr^{-1}$) | B | All | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1) Vol. 3, Section 5.2.3 and LTP App. 6F, Section 3 (1.1E-04 $m^2/h$ / 82.03 $m^2$) | NR | NR | NR | NR | NR |
| Removable fraction | P | All | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), Section 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (d) | P | H-3 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | C-14 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Fe-55 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Co-60 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ni-63 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

**Input Parameters for Building Occupancy DCGL Determination**

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Sr-90 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Nb-94 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Tc-99 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ag-108m | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sb-125 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-134 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-137 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-152 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-154 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-155 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-238 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-239 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

**Input Parameters for Building Occupancy DCGL Determination**

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Am-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cm-243 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| Radionuclide concentration (pCi/m²) | P | All | D | 1 | Assumed unit concentration | NR | NR | NR | NR | NR |
| **Source 4. East Wall** | | | | | | | | | | |
| Type | P | All | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | All | D | X | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | All | D | 4.44, 2.22, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area (m²) | P | All | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | All | D | 1 | NUREG/CR-6697 (Ref. 3), Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | All | D | 0.07 | NUREG/CR-6697 (Ref. 3), Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion (hr⁻¹) | B | All | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1), Section 5.2.3 and LTP App. 6F, Section 3 (1.1E-04m²/h / 82.03m²) | NR | NR | NR | NR | NR |
| Removable fraction | P | All | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), Section 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (d) | P | H-3 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | C-14 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Fe-55 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Co-60 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

| Input Parameters for Building Occupancy DCGL Determination | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Ni-63 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sr-90 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Nb-94 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Tc-99 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ag-108m | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sb-125 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-134 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-137 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-152 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-154 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-155 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-238 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-239 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

**Input Parameters for Building Occupancy DCGL Determination**

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Pu-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Am-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cm-243 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| Radionuclide concentration ($pCi/m^2$) | P | All | D | 1 | Assumed unit concentration | NR | NR | NR | NR | NR |
| **Source 5. South Wall** | | | | | | | | | | |
| Type | P | All | D | Area | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Direction | P | All | D | Y | NUREG/CR-5512 (Ref. 1) | NR | NR | NR | NR | NR |
| Location of center of source: x,y,z (m) | P | All | D | 2.22, 0, 1.76 | Site-specific model, LTP App. 6F, Section 2 | NR | NR | NR | NR | NR |
| Area ($m^2$) | P | All | D | 15.58 | Site-specific model, LTP App. 6F, Section 1 | NR | NR | NR | NR | NR |
| Air fraction for H-3 | B | All | D | 1 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Air fraction (for all nuclides except H-3) | B | All | D | 0.07 | NUREG/CR-6697 (Ref. 3) Att. C, Section 8.6 | NR | NR | NR | NR | NR |
| Direct ingestion ($hr^{-1}$) | B | All | D | 1.34E-6 | NUREG/CR-5512 (Ref. 1), Section 5.2.3 and LTP App. 6F, Section 3 ($1.1E\text{-}04 m^2/h$ / $82.03 m^2$) | NR | NR | NR | NR | NR |
| Removable fraction | P | All | D | 0.1 | NUREG-1727 (Ref. 6) Table C7.1 and NUREG/CR-6755 (Ref. 2), Section 3.5 | NR | NR | NR | NR | NR |
| Time for source removal (d) | P | H-3 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | C-14 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Fe-55 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

**Input Parameters for Building Occupancy DCGL Determination**

| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Co-60 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ni-63 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sr-90 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Nb-94 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Tc-99 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Ag-108m | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Sb-125 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-134 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cs-137 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-152 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-154 | D | 52777 | 75th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Eu-155 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-238 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |

| Input Parameters for Building Occupancy DCGL Determination | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter (unit) | Type[a] | Radionuclide | Treatment[b] | Value or Distribution | Basis | Distribution's Statistical Parameters[c] | | | | Median |
| | | | | | | 1 | 2 | 3 | 4 | |
| | P | Pu-239 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Pu-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Am-241 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| | P | Cm-243 | D | 18240 | 25th percentile value of distribution in NUREG/CR-6755 (Ref. 2) | NR | NR | NR | NR | NR |
| Radionuclide concentration (pCi/m²) | P | All | D | 1 | Assumed unit concentration | NR | NR | NR | NR | NR |

Notes:

[a] P = physical, B = behavioral, M = metabolic (NUREG/CR-6697 (Ref. 3) Att. B, Table 4.3)
[b] D = deterministic, S = stochastic
[c] Statistical Parameters
Loguniform 1 = minimum, 2 = maximum
NR = Not Required
Input Correlations (used only if both input parameters use distributions): resuspension rate and deposition velocity = 0.9
Run Specifications:
Random seed = 1000
Number of Observations = 300
Number of Repetitions = 1
Dose Integrations = 5

References:

1. NUREG/CR-5512, "Residual Radioactive Contamination from Decommissioning," Volume 3: "Parameter Analysis, Draft Report for Comment," October 1999 (SAND99-2148).

2. NUREG/CR-6755, "Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code," February. 2002 (ANL/EAD/TM/02-1).

3. NUREG/CR-6697, "Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes," November 2000, (ANL/EAD/TM-98).

4. Eckerman, K.F., et al, "External Exposure to Radionuclides In Air, Water, And Soil," EPA 402-R-93-081, Federal Guidance Report No. 12 (FGR-12), U.S. EPA, 1993.

5. Eckerman, K.F., et al., "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," EPA-520/1-88-020, Federal Guidance Report No. 11 (FGR-11), U.S. EPA, 1988.

6. NUREG-1727, "NMSS Decommissioning Standard Review Plan," September 2000.

# Appendix 6J

# Building Surface Area DCGL Results

## Building Surface DCGL Results

| Nuclide | Dose Conversion Factor (DCF) (mrem/yr per pCi/m$^2$) | DCGL (pCi/m$^2$) | DCGL (dpm/100cm$^2$) |
|---|---|---|---|
| H-3 | 1.6E-09 | 1.5E+10 | 3.4E+08 |
| C-14 | 5.4E-08 | 4.6E+08 | 1.0E+07 |
| Fe-55 | 1.4E-08 | 1.8E+09 | 4.0E+07 |
| Co-60 | 3.1E-05 | 8.1E+05 | 1.8E+04 |
| Ni-63 | 1.5E-08 | 1.7E+09 | 3.7E+07 |
| Sr-90 | 4.0E-06 | 6.3E+06 | 1.4E+05 |
| Nb-94 | 2.1E-05 | 1.2E+06 | 2.6E+04 |
| Tc-99 | 3.9E-08 | 6.5E+08 | 1.4E+07 |
| Ag-108m | 2.2E-05 | 1.1E+06 | 2.5E+04 |
| Sb-125 | 5.5E-06 | 4.5E+06 | 1.0E+05 |
| Cs-134 | 1.9E-05 | 1.3E+06 | 2.9E+04 |
| Cs-137 | 8.8E-06 | 2.8E+06 | 6.3E+04 |
| Eu-152 | 1.5E-05 | 1.7E+06 | 3.7E+04 |
| Eu-154 | 1.6E-05 | 1.6E+06 | 3.4E+04 |
| Eu-155 | 8.5E-07 | 2.9E+07 | 6.5E+05 |
| Pu-238 | 9.7E-05 | 2.6E+05 | 5.7E+03 |
| Pu-239 | 1.1E-04 | 2.3E+05 | 5.1E+03 |
| Pu-241 | 2.3E-06 | 1.1E+07 | 2.5E+05 |
| Am-241 | 1.1E-04 | 2.2E+05 | 5.0E+03 |
| Cm-243 | 7.7E-05 | 3.2E+05 | 7.2E+03 |

# Appendix 6K

# Input Parameter Values for Area Factors, Soil

1. General Information

The input parameters for the soil area factor calculations are, in general, the same as those in LTP Appendix 6D. Areas of difference in input parameter values are highlighted in the sections to follow.

2. Conceptual Model, Scenario, and Dose Pathways

The resident farmer scenario, as described in Volume 1 of NUREG/CR-5512 (Ref. 1), assumes a reasonably conservative scenario for establishing DCGL values for residual radioactivity in soil. The same scenario is assumed for the area factor (AF) calculations.

The conceptual model used in the code is based on the site characteristics expected at the time of release of the site. The model is comprised of a contaminated zone underlain by an unsaturated zone underlain by a saturated zone. The contaminated zone is assumed to be at the ground surface with no cover material and the ground water is initially uncontaminated.

The potential exposure pathways that apply to the resident farmer are listed below and are based upon those in NUREG/CR-5512, Volume 1:

- Direct exposure to external radiation from residual radioactivity;
- Internal dose from inhalation of airborne radionuclides; and
- Internal dose from ingestion of
  - Plant foods grown in media containing residual radioactivity and irrigated with water containing residual radioactivity,
  - Meat and milk from livestock fed with fodder grown in soil containing residual radioactivity and water containing residual radioactivity,
  - Drinking water (containing residual radioactivity) from a well,
  - Fish from a pond containing residual radioactivity, and
  - Soil containing residual radioactivity.

3. Contaminated Fractions — Food Pathways

As the size of the contaminated area (A) varies, the fraction of the total food consumed by the receptor grown in the contaminated area will also vary. The fraction of the food supply grown in the contaminated is referred to as a "contaminated fraction." Accordingly, with the decrease in the size of the contaminated area, a decrease in the values for the contaminated fraction of plant food ingested (FPLANT), the contaminated fraction of meat ingested (FMEAT), and contaminated fraction of milk ingested (FMILK) will also result.

The variation in the contaminated fraction of plant food ingested, with the variation in the size of the contaminated area, is described by Equation D.5 of the RESRAD User Manual (Ref. 2):

$$FPLANT = A/2000, \text{ when } A \leq 1000 \text{ m}^2$$

$$FPLANT = 0.5, \text{ when } A \geq 1000 \text{ m}^2$$

However, the assumption used in calculating soil DCGLs is that 100% of the plant food consumed is grown in the contaminated area (equivalent to a contaminated fraction = 1.0), when the size of the contaminated area is 13,022 $m^2$. Thus, Equation D.5 of the RESRAD User Manual has been adjusted, as follows, to match that assumption, and this adjusted relationship is used in the calculation of area factors:

FPLANT = A/1000, when A < 1000 $m^2$
FPLANT = 1.0, when A ≥ 1000 $m^2$

The variation in the contaminated fraction of meat and milk ingested, with the variation in the size of the contaminated area, is also described by Equation D.5 of the RESRAD User Manual (Ref. 2):

FA = A/20000, when A ≤ 20000 $m^2$
FA = 1.0, when A ≥ 20000 $m^2$

Where FA = FMEAT or FMILK

Again the assumption used in calculating soil DCGLs is that 100% of the meat food and milk consumed are grown in the contaminated area (equivalent to a contaminated fraction = 1.0 for meat and milk), when the size of the contaminated area is 13,022 $m^2$. Equation D.5 of the RESRAD User Manual has been adjusted, as follows, to match that assumption, and this adjusted relationship is used in the calculation of area factors:

FA = A/13,022 A < 13022 $m^2$
FA = 1 A = 13022 $m^2$

Where FA = FMEAT or FMILK

Table 1 shows the values for FPLANT, FMEAT, and FMILK as a function of the size of the contaminated zone.

4. Contaminated Fraction – Water Pathways

Unlike the contaminated fractions of food described above, the contaminated fractions for drinking water (FDW), livestock water (FLW), irrigation water (FIRW), and aquatic food (FR9) are assumed not to decrease as the size of the contaminated zone decreases. Setting the values for these input parameters to 1.0 maintains the assumption that all water used by the resident farmer comes from a well on site, regardless of the size of the contaminated area.

5. Size of the Contaminated Zone

Another input parameter that is influenced by changes in the size of the contaminated zone is the length parallel to aquifer flow (LCZPAQ). As the area of the contaminated zone decreases, the value of LCZPAQ will also decrease. As the contaminated zone is assumed to be circular, the value for LCZPAQ is equal to the diameter of the circle:

$$LCZPAQ(m) = 2\sqrt{\frac{A(m^2)}{\pi}}$$

Table 1 shows the values for LCZPAQ as a function of the size of the contaminated zone.

**Table 1**
**Contaminated Fractions Versus Size of Contaminated Zone**

| RESRAD Parameter | Input Value | | | | | | |
|---|---|---|---|---|---|---|---|
| **Contaminated Zone Area ($m^2$)** | **13022** | **11500** | **10000** | **7500** | **5000** | **2500** | **1000** |
| LCZPAQ (m) | 129 | 121 | 113 | 98 | 80 | 56 | 36 |
| FPLANT | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 |
| FMEAT | 1.0E+00 | 8.8E-01 | 7.7E-01 | 5.8E-01 | 3.8E-01 | 1.9E-01 | 7.7E-02 |
| FMILK | 1.0E+00 | 8.8E-01 | 7.7E-01 | 5.8E-01 | 3.8E-01 | 1.9E-01 | 7.7E-02 |
| **Contaminated Zone Area ($m^2$)** | **750** | **500** | **250** | **100** | **75** | **50** | **25** |
| LCZPAQ (m) | 31 | 25 | 18 | 11 | 9.8 | 8.0 | 5.6 |
| FPLANT | 7.5E-01 | 5.0E-01 | 2.5E-01 | 1.0E-01 | 7.5E-02 | 5.0E-02 | 2.5E-02 |
| FMEAT | 5.8E-02 | 3.8E-02 | 1.9E-02 | 7.7E-03 | 5.8E-03 | 3.8E-03 | 1.9E-03 |
| FMILK | 5.8E-02 | 3.8E-02 | 1.9E-02 | 7.7E-03 | 5.8E-03 | 3.8E-03 | 1.9E-03 |
| **Contaminated Zone Area ($m^2$)** | **10** | **8** | **6** | **4** | **2** | **1** | -- |
| LCZPAQ (m) | 3.6 | 3.2 | 2.8 | 2.3 | 1.6 | 1.1 | -- |
| FPLANT | 1.0E-02 | 8.0E-03 | 6.0E-03 | 4.0E-03 | 2.0E-03 | 1.0E-03 | -- |
| FMEAT | 7.7E-04 | 6.1E-04 | 4.6E-04 | 3.1E-04 | 1.5E-04 | 7.7E-05 | -- |
| FMILK | 7.7E-04 | 6.1E-04 | 4.6E-04 | 3.1E-04 | 1.5E-04 | 7.7E-05 | -- |

6. Year of Maximum Dose

The year in which the maximum dose occurs may vary depending on the nuclide. The concentration delivering the maximum dose is selected for the basis of the AF without regard to year of occurrence.

7. Initial Concentration

An initial soil concentration of 1 pCi/g is assumed for each nuclide.

References:

1. NUREG/CR-5512, "Residual Radioactive Contamination From Decommissioning," Volume 1: "Technical Basis for Translating Contamination Levels to Annual TEDE," October 1992.

2. Yu, C. et al., "Users Manual for RESRAD Version 6," ANL/EAD-4, July 2001.

# Appendix 6L

# Area Factors for Soil

# Area Factors for Soil

| Nuclide | Area of Source ($m^2$) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 13022 | 11500 | 10000 | 7500 | 5000 | 2500 | 1000 | 750 | 500 | 250 |
| H-3 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.3E+00 | 1.5E+00 | 1.8E+00 | 2.0E+00 | 2.7E+00 | 4.0E+00 | 8.0E+00 |
| C-14 | 1.0E+00 | 1.1E+00 | 1.3E+00 | 1.6E+00 | 2.3E+00 | 3.7E+00 | 6.4E+00 | 9.7E+00 | 1.7E+01 | 4.5E+01 |
| Fe-55 | 1.0E+00 | 1.1E+00 | 1.3E+00 | 1.6E+00 | 2.2E+00 | 3.4E+00 | 5.2E+00 | 7.0E+00 | 1.1E+01 | 2.1E+01 |
| Co-60 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.2E+00 | 1.2E+00 | 1.3E+00 |
| Ni-63 | 1.0E+00 | 1.1E+00 | 1.2E+00 | 1.5E+00 | 2.0E+00 | 2.8E+00 | 3.8E+00 | 5.1E+00 | 7.7E+00 | 1.5E+01 |
| Sr-90 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.2E+00 | 1.3E+00 | 1.4E+00 | 1.8E+00 | 2.7E+00 | 5.4E+00 |
| Nb-94 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 |
| Tc-99 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.5E+00 | 2.3E+00 | 4.5E+00 |
| Ag-108m | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 |
| Sb-125 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 |
| Cs-134 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.2E+00 | 1.3E+00 | 1.4E+00 | 1.5E+00 | 1.6E+00 | 1.7E+00 | 1.8E+00 |
| Cs-137 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.2E+00 | 1.4E+00 | 1.6E+00 | 1.7E+00 | 1.9E+00 | 2.1E+00 | 2.4E+00 |
| Eu-152 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 |
| Eu-154 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 |
| Eu-155 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 | 1.1E+00 |
| Pu-238 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.4E+00 | 2.0E+00 | 4.0E+00 |
| Pu239 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.4E+00 | 2.0E+00 | 4.0E+00 |
| Pu241 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.3E+00 | 2.0E+00 | 3.8E+00 |
| Am-241 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.3E+00 | 2.0E+00 | 3.8E+00 |
| Cm-243 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.2E+00 | 1.6E+00 | 2.3E+00 |
| Nuclide | Area of Source ($m^2$) | | | | | | | | | |
| | 100 | 75 | 50 | 25 | 10 | 8 | 6 | 4 | 2 | 1 |
| H-3 | 2.0E+01 | 2.6E+01 | 3.9E+01 | 7.5E+01 | 1.8E+02 | 2.2E+02 | 2.9E+02 | 4.2E+02 | 8.0E+02 | 1.5E+03 |
| C-14 | 1.5E+02 | 2.2E+02 | 3.7E+02 | 8.6E+02 | 2.4E+03 | 3.1E+03 | 4.1E+03 | 6.0E+03 | 1.2E+04 | 2.4E+04 |
| Fe-55 | 5.2E+01 | 7.0E+01 | 1.0E+02 | 2.1E+02 | 5.2E+02 | 6.5E+02 | 8.5E+02 | 1.3E+03 | 2.5E+03 | 4.7E+03 |
| Co-60 | 1.4E+00 | 1.4E+00 | 1.5E+00 | 1.8E+00 | 2.4E+00 | 2.7E+00 | 3.2E+00 | 4.1E+00 | 6.5E+00 | 1.1E+01 |
| Ni-63 | 3.8E+01 | 5.1E+01 | 7.7E+01 | 1.5E+02 | 3.8E+02 | 4.8E+02 | 6.4E+02 | 9.5E+02 | 1.9E+03 | 3.8E+03 |
| Sr-90 | 1.4E+01 | 1.8E+01 | 2.7E+01 | 5.4E+01 | 1.3E+02 | 1.6E+02 | 2.2E+02 | 3.2E+02 | 6.4E+02 | 1.3E+03 |
| Nb-94 | 1.2E+00 | 1.2E+00 | 1.3E+00 | 1.5E+00 | 2.0E+00 | 2.3E+00 | 2.8E+00 | 3.5E+00 | 5.5E+00 | 9.3E+00 |
| Tc-99 | 1.1E+01 | 1.5E+01 | 2.3E+01 | 4.5E+01 | 1.1E+02 | 1.4E+02 | 1.9E+02 | 2.8E+02 | 5.6E+02 | 1.1E+03 |
| Ag-108m | 1.2E+00 | 1.2E+00 | 1.3E+00 | 1.5E+00 | 2.0E+00 | 2.3E+00 | 2.7E+00 | 3.5E+00 | 5.5E+00 | 9.2E+00 |
| Sb-125 | 1.2E+00 | 1.2E+00 | 1.3E+00 | 1.5E+00 | 2.0E+00 | 2.3E+00 | 2.7E+00 | 3.5E+00 | 5.4E+00 | 9.1E+00 |
| Cs-134 | 2.0E+00 | 2.1E+00 | 2.3E+00 | 2.7E+00 | 3.6E+00 | 4.0E+00 | 4.8E+00 | 6.1E+00 | 9.7E+00 | 1.6E+01 |
| Cs-137 | 2.8E+00 | 2.9E+00 | 3.1E+00 | 3.7E+00 | 4.9E+00 | 5.6E+00 | 6.6E+00 | 8.5E+00 | 1.3E+01 | 2.2E+01 |
| Eu-152 | 1.2E+00 | 1.2E+00 | 1.3E+00 | 1.5E+00 | 2.1E+00 | 2.3E+00 | 2.8E+00 | 3.5E+00 | 5.6E+00 | 9.4E+00 |
| Eu-154 | 1.2E+00 | 1.3E+00 | 1.3E+00 | 1.5E+00 | 2.1E+00 | 2.4E+00 | 2.8E+00 | 3.6E+00 | 5.6E+00 | 9.6E+00 |
| Eu-155 | 1.2E+00 | 1.2E+00 | 1.3E+00 | 1.5E+00 | 1.9E+00 | 2.2E+00 | 2.6E+00 | 3.2E+00 | 5.0E+00 | 8.0E+00 |
| Pu-238 | 9.7E+00 | 1.3E+01 | 1.9E+01 | 3.4E+01 | 7.2E+01 | 8.4E+01 | 1.0E+02 | 1.3E+02 | 1.8E+02 | 2.4E+02 |
| Pu239 | 9.7E+00 | 1.3E+01 | 1.9E+01 | 3.4E+01 | 7.2E+01 | 8.4E+01 | 1.0E+02 | 1.3E+02 | 1.8E+02 | 2.4E+02 |
| Pu241 | 8.7E+00 | 1.1E+01 | 1.5E+01 | 2.5E+01 | 4.5E+01 | 5.2E+01 | 6.3E+01 | 8.0E+01 | 1.2E+02 | 1.6E+02 |
| Am-241 | 8.7E+00 | 1.1E+01 | 1.5E+01 | 2.5E+01 | 4.5E+01 | 5.2E+01 | 6.2E+01 | 7.9E+01 | 1.2E+02 | 1.6E+02 |
| Cm-243 | 3.3E+00 | 3.6E+00 | 4.0E+00 | 4.9E+00 | 6.8E+00 | 7.7E+00 | 9.1E+00 | 1.2E+01 | 1.8E+01 | 3.0E+01 |

# Appendix 6M

## Input Parameter Values for Area Factors, Building Occupancy

1. Changes to Input Parameter Set for Building Occupancy DCGLs.

In calculating area factors (AF) for building surfaces, RESRAD-BUILD (v 3.21) was used with the building occupancy scenario to determine the annual dose from 1pCi/m2 for various size sources. A modification of the input assumptions, used for calculating building occupancy DCGLs, was made to consider that only the specified area of the floor as contaminated. The size of this contaminated area is varied from the value of the entire floor surface area (19.7 $m^2$) to a value of 1 $m^2$. In calculating the AFs, the contamination of the entire floor is considered as the base case and a specific derived concentration guideline is defined. This specific DCGL is designated $DCGL_{wl}$ to differentiate it from the $DCGL_w$ determined for the entire room. The remaining parameters are those described in LTP Appendix 6G.

# Appendix 6N

# Area Factors for Building Surface Areas

## Area Factors for Building Surfaces

| Nuclide | Area of Source ($m^2$) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 19.7 | 15 | 12 | 10 | 8 | 6 | 4 | 2 | 1 |
| H-3 | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 3.3 | 4.9 | 9.9 | 19.7 |
| C-14 | 1.0 | 1.3 | 1.6 | 2.0 | 2.4 | 3.3 | 4.9 | 9.7 | 19.4 |
| Fe-55 | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 3.3 | 4.9 | 9.9 | 19.7 |
| Co-60 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.4 | 4.1 | 7.3 |
| Ni-63 | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 3.3 | 4.9 | 9.9 | 19.7 |
| Sr-90 | 1.0 | 1.3 | 1.6 | 1.9 | 2.4 | 3.2 | 4.8 | 9.4 | 18.6 |
| Nb-94 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.4 | 4.0 | 7.2 |
| Tc-99 | 1.0 | 1.3 | 1.6 | 1.9 | 2.4 | 3.2 | 4.7 | 9.2 | 18.2 |
| Ag-108m | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.4 | 4.0 | 7.2 |
| Sb-125 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.4 | 4.1 | 7.2 |
| Cs-134 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.5 | 4.2 | 7.4 |
| Cs-137 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.5 | 4.2 | 7.6 |
| Eu-152 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.4 | 4.0 | 7.2 |
| Eu-154 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.4 | 4.0 | 7.2 |
| Eu-155 | 1.0 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.5 | 4.1 | 7.4 |
| Pu-238 | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 3.3 | 4.9 | 9.9 | 19.7 |
| Pu-239 | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 3.3 | 4.9 | 9.8 | 19.8 |
| Pu-241 | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 3.3 | 4.9 | 9.8 | 19.5 |
| Am-241 | 1.0 | 1.3 | 1.6 | 2.0 | 2.4 | 3.3 | 4.9 | 9.7 | 19.5 |
| Cm-243 | 1.0 | 1.3 | 1.6 | 1.9 | 2.4 | 3.2 | 4.7 | 9.3 | 18.5 |