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Public Service
Company of Colorado

January 31, 1997
Fort St. Vrain
P-97007

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

ATTN: Mr. John W. Hickey, Chief
Decommissioning and
Regulatory Issues Branch

Docket No. 50-267

**SUBJECT: Response to NRC Comments Regarding the Proposed Sampling
and Survey Plan for the FSV Effluent Pathway**

REFERENCES:

1. NRC Letter, Pittiglio to Crawford, dated January 8, 1997
(G-97001)
2. PSCo Letter, Borst to Weber, dated September 11, 1996
(P-96068)
3. PSCo Letter, Borst to Weber, dated October 30, 1996
(P-96091)

Dear Mr. Hickey:

Attached are Public Service Company of Colorado's (PSCo) responses to the NRC's comments provided in Reference 1, regarding the sampling and survey plan used for the final radiological survey of the liquid effluent pathway at Fort St. Vrain. PSCo previously submitted a proposed sampling and survey plan for this area in Reference 2, and the survey results for this area were included in Volume 6 of the Final Survey Report, submitted via Reference 3.

As explained in Reference 2, the liquid effluent pathway at Fort St. Vrain consists of concrete lined ditches, unlined ditches, and a 25 acre farm pond. Adjacent farm pasture lands have historically been irrigated with water from these ditches. Each of these areas presents a different potential for contamination. PSCo's proposed plan divides the effluent pathway area into three classifications, with three different levels of survey coverage so that survey resources can be allocated to those areas with the greatest

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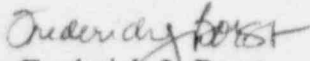
Page 2

potential for contamination. The division of effluent pathway areas is based on an extensive characterization survey program that tracked radioactivity in ditch sediments and adjacent areas since 1994. In response to an NRC question, survey data from this characterization survey program is provided in a binder enclosed with this letter, which is intended to be added to the Fort St. Vrain Final Survey Report.

PSCo considers that the sampling and survey plan used for final survey of the Fort St. Vrain liquid effluent pathway is reasonable and sufficiently comprehensive. Also, we consider that the survey data provided in the initial submittal of the Final Survey Report, Reference 3, and in the binder enclosed with this letter, demonstrate that this area satisfies the acceptance criteria for unconditional release. PSCo requests your approval as soon as practical.

If you have any questions regarding this information, please contact Mr. M. H. Holmes at (303) 571-7633.

Sincerely,



Frederick J. Borst
Decommissioning Program Director

FJB/SWC

Attachments

cc: w/attachments

Regional Administrator, Region IV

Mr. Robert M. Quillin, Director
Radiation Control Division
Colorado Department of Public Health and Environment

ATTACHMENT TO P-97007

**RESPONSE TO NRC COMMENTS PROVIDED
IN LETTER DATED JANUARY 8, 1997**

**REGARDING PROPOSED SAMPLING AND
SURVEY PLAN FOR FORT ST. VRAIN
LIQUID EFFLUENT PATHWAY**

NRC Comment 1)

The RESRAD analysis for determining the site-specific guideline values used a scenario that assumes the open land areas will continue to be used as pasture land. Additional information is needed to support the assumed future land use and potential future dose to members of the public. PSC should use the default parameters from Scenario C of PG-8-08 to determine the most conservative unrestricted use dose and compare this dose with the dose using the site-specific guideline values PSC believes to be more realistic. Approval of the alternate scenario will depend on the magnitude of the differences between the baseline and guideline values, the time required for the dose from Scenario C to be reduced to acceptable levels by radionuclide decay (which provides an indication of how long the alternate land use scenario would need to be in place), and the strength of the justification for the alternative scenario.

PSCo Response:

PSCo developed site specific guideline values (SGLV) for residual nuclide concentrations in soil, water and sediment. Soil and sediment SGLVs were determined using RESRAD and NRC Policy and Guidance Directive (PG-8-08) resident farmer scenario (C) with adjustments to certain parameters as appropriate for Fort St. Vrain as described in FSV-FRS-TBD-209, "Final Survey Requirements for the Liquid Effluent Pathway", submitted on September 11, 1996 (P-96068). Please note that for simplicity the word dose is used throughout the responses in lieu of annual total effective dose equivalent.

In response to the request to provide additional information to support the assumed future land use, PSCo understands that the key issue involves PSCo's assumption that no residences would be established onsite. PSCo identified the site specific RESRAD parameter values used at Fort St. Vrain in Section 7.7 of FSV-FRS-TBD-209. PG-8-08 assumes the Onsite Fraction of Time Indoors for the exposed individual is 0.55; TBD-209 states that for Fort St. Vrain this factor is 0.00, since "[T]his owner-controlled area has historically been used as permanent pasture, and would not reasonably be used as the location of a residence." This assumption is further justified as follows:

- All lands considered part of the liquid effluent pathway have been owned by PSCo for the entire duration of the Fort St. Vrain license period, and PSCo has no plans to change the ownership status of these lands.
- The liquid effluent pathway has historically been used exclusively for agricultural purposes. Because of its topography and because it is well-served by irrigation ditches, which are extremely valuable in this arid western region, this land is well suited for agricultural use. PSCo maintains the active agricultural use of these lands through a property manager and is very satisfied with this arrangement. PSCo has no plans to change the active agricultural status of these lands.

- The remaining Fort St. Vrain site is valuable to PSCo as a repowered generating station and switchyard. PSCo has already completed installation of a 130 MWe natural gas-fired combustion turbine and is in the process of installing a 102 MWe heat recovery steam generator. There are plans to install an additional combustion turbine and heat recovery steam generator to bring the total generating capacity of the Fort St. Vrain site to 471 MWe in 1999. PSCo has no plans to change the current industrial status of the Fort St. Vrain site.
- The discussions below of unrestricted dose in the liquid effluent pathway demonstrate that the estimated dose using site specific parameters for the survey area with the highest UCL concentrations, is currently less than 10 mrem per year, as required by the Fort St. Vrain Final Survey Plan. Even in the most conservative scenario (which is based on nuclide concentrations found in a marshy area adjacent to an irrigation ditch), a conservative analysis using PG-8-08 default values for the Resident Farmer scenario indicates that the unrestricted dose would decay to less than 10 mrem in about 4.5 years.
- All of the areas with elevated nuclide concentrations were located adjacent to ditches, marsh areas, or the sediment storage area. PSCo does not consider it likely that residences will be built on these areas, and if they are, the process of filling in marsh areas or digging up ground for a foundation would cover or remove the surface activity.
- It is unlikely that the liquid effluent pathway would be used for a housing development within 2 to 3 years because of the planning process, zoning changes, permit requirements, site preparation and construction activities associated with such a project. Construction of a single individual residence would likely require a year and would most likely be in an area with nuclide concentrations that are well within the site specific guideline values, as determined above using the PG-8-08 default parameters.

PSCo has determined dose conversion factors using scenario C from PG-8-08. A comparison of the PG-8-08 scenario C and FSV-TBD-209 concentration guideline values for soil which are equivalent to 10 mrem/year is provided in Table 1-1.

Table 1-1
Comparison of Concentration Guideline Values

Nuclide	PG-8-08 Scenario C (pCi/g/10mrem)	FSV-TBD-209 (pCi/g/10mrem)
Co-60	1.86E+00	5.58E+00
Cs-134	2.87E+00	7.87E+00
Cs-137	7.48E+00	1.87E+01
Eu-152	4.25E+00	1.32E+01
Eu-154	3.90E+00	1.21E+01
Eu-155	1.42E+02	4.39E+02
Fe-55	2.40E+04	2.46E+04
H-3	9.12E+02	9.12E+02
Sr-90	9.19E+00	9.27E+00

For comparison of the dose using PG-8-08, scenario C, and the dose associated with the guideline values PSC believes to be more realistic, two approaches have been used.

Comparison 1 used the maximum weighted mean concentration result identified during Final survey to estimate the most conservative unrestricted use dose (PG-8-08, scenario C), and to estimate the time required for the dose to be reduced to 10 mrem per year. The maximum weighted mean was calculated for 100 m² area in accordance with FSV Final Survey Plan equations and was obtained during Investigation surveys within Survey Area E0008, Irrigation Ditch 2, North and South Marsh.

Comparison 2 used the survey unit having the highest average concentration (upper confidence limit of the mean at the 95% confidence level, UCL) identified during Final survey to estimate the most conservative unrestricted use dose (PG-8-08, scenario C) and to estimate the time required for the dose to be reduced to 10 mrem per year.

The default parameters for occupancy (onsite and offsite fractions) from Scenario C of PG-8-08 were used for these evaluations. Other parameters (i.e. irrigation rate and precipitation rate, and length parallel to aquifer) listed in Table 7.5 of FSV-TBD-209 were not altered for this evaluation. These values were considered to be more conservative than those listed in PG-8-08.

For these comparisons, it was conservatively assumed that the activity was uniformly distributed

over the entire area of the Liquid Effluent Pathway (207,300 square meters). This includes the area adjacent to the pathway ditches and pasture lands irrigated from the ditches, and is the same assumption used to calculate the FSV-TBD-209 guideline values. The concentrations were assumed to be uniformly distributed over the entire area of the Liquid Effluent Pathway to provide a conservative estimate of potential for exposure. The PG-8-08, scenario C doses were compared with resulting doses obtained using FSV-TBD-209. A summary table is provided in Table 1-2 below, detailed explanations about the results follow.

Table 1-2
Summary of Dose Comparisons Between PG-8-08, Scenario C, and FSV-TBD-209

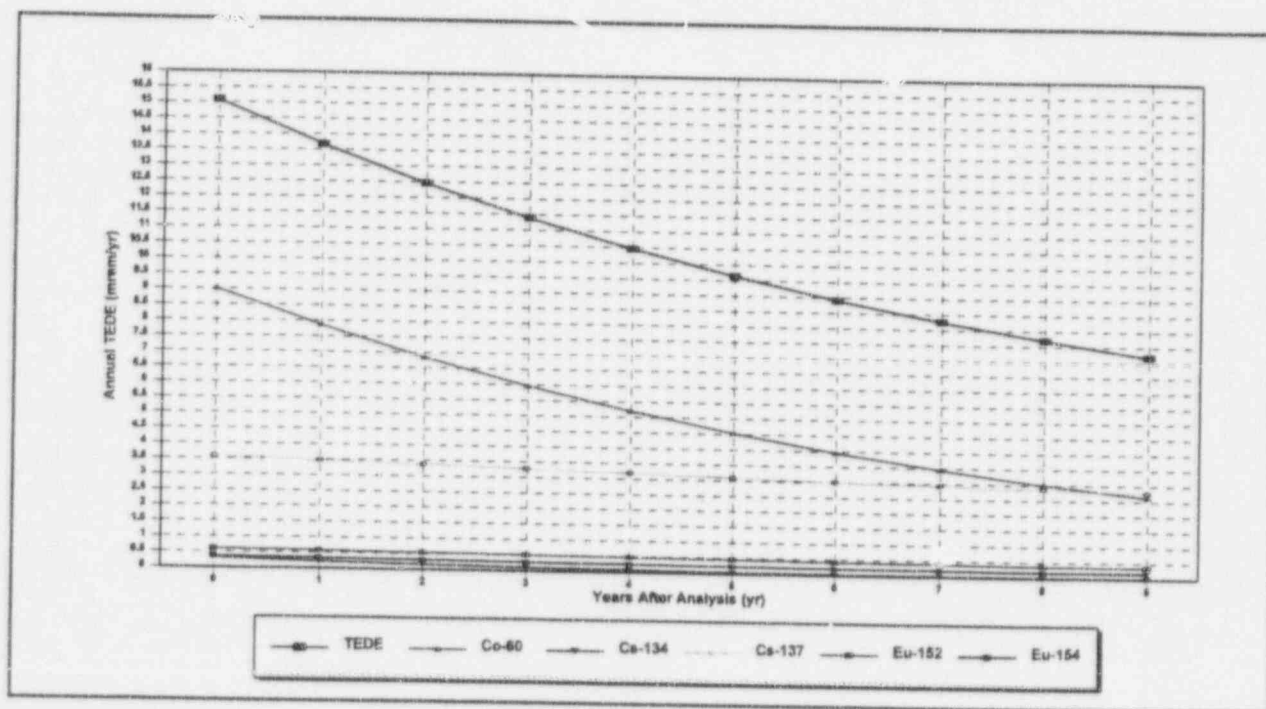
	FSV-TBD-209 mrem/yr @ t=0	PG-8-08 Scenario C mrem/yr @ t=0	PG-8-08 Scenario C, time to reach 10 mrem/yr
Comparison 1 max weighted mean Survey Area E0008 100 m ² area	5.4 mrem/yr	15.1 mrem/yr	4.5 years
Comparison 2 survey unit with highest average UCL, Survey Area E0008	3.4 mrem/yr	7.6 mrem/yr	0

Also, please note that a typographical error exists in FSV-TBD-209, Table 7.5. The PG-8-08 value for Onsite Fraction of Time Indoors should be 0.55 versus 0.21. The RESRAD Default value for Onsite Fraction of Time Outdoors should be 0.21 versus 0.55.

Comparison 1

For evaluation of the maximum weighted mean, the averages of each of the nuclide concentration from the Investigation samples collected within the 100 square meter area were used for the RESRAD analysis. The resulting estimate of the potential dose using PG-8-08, scenario C assumptions is 15.1 mrem/year at $t=0$ and is shown in Figure 1-1. After a period of approximately 4.5 years, the dose is reduced to 10 mrem per year. The RESRAD summary report has been included as Attachment 1.

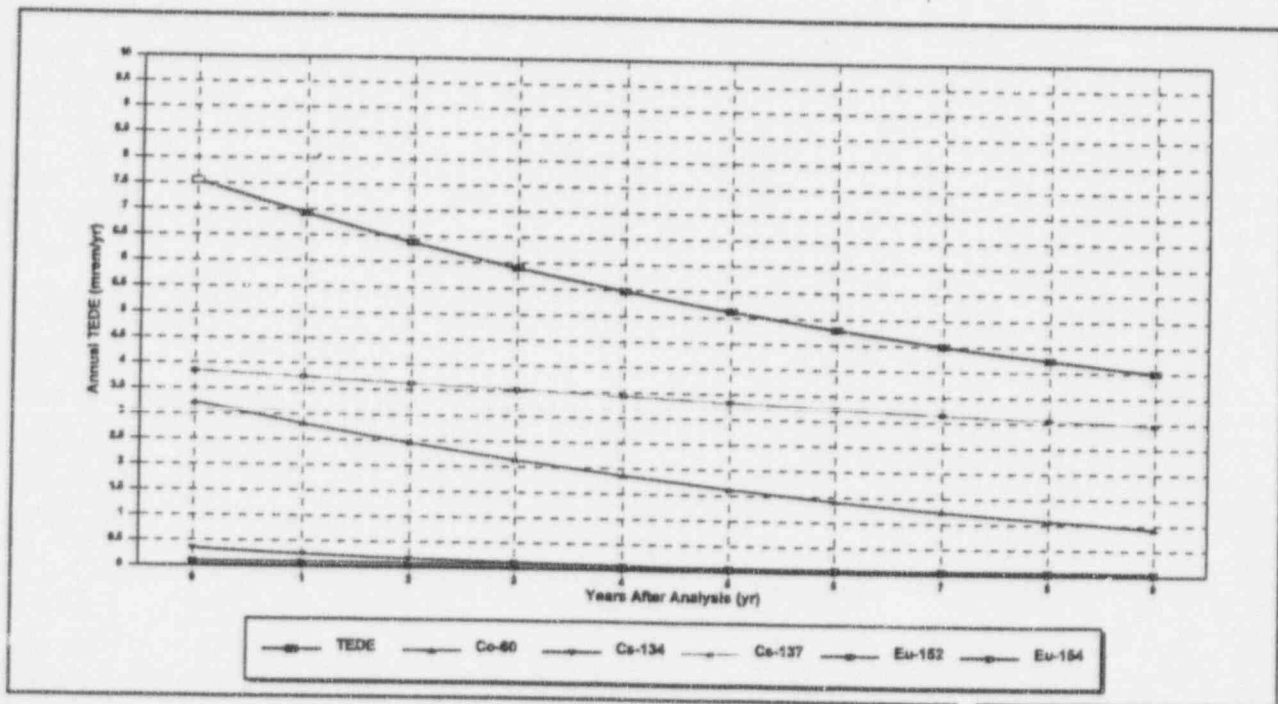
Figure 1-1
TEDE Based on Maximum Weighted Mean
100 Square Meter Area, Assumed Uniform Distribution Over 207,300 Square Meters



Comparison 2

Using the PG-8-08, Scenario C assumptions for evaluation of the survey unit having the highest average concentration (UCL), resulted in a estimate of the unrestricted use dose at $t=0$ of less than 10 mrem per year as shown in Figure 1-2. The corresponding RESRAD summary report has been included as Attachment 2.

Figure 1-2
TEDE Based on Highest Survey Unit Average (UCL) Concentration
Assumed Uniform Distribution Over 207,300 Square Meters



The evaluation shown in Figure 1-2 shows that under these conservative assumptions, the estimate of the dose for the survey unit having the highest average concentration would not exceed 10 mrem/yr. The maximum weighted mean for the 100 square meter area containing an elevated sample result (Figure 1-1) would not result in an estimate significantly greater than 10 mrem per year, and would be reduced to less than 10 mrem/year within a period of approximately 4.5 years.

PG-8-08 assumes occupancy over uniform activity distribution rather than periodic exposure within reasonable proximity to localized sources. For conditions of localized activity, it is appropriate to base the estimate of the dose on an average obtained from an area of 100 square meters, or more, in order to approximate a realistic exposure scenario.

As further indication of the conservatism in the liquid effluent pathway analysis, PSCo determined that even if all of the activity released via the liquid effluent pathway during decommissioning were to remain in the 207,300 m² area, the resultant nuclide concentrations would be less than the Guideline Values identified in Table 1-1. Based on Fort St. Vrain's Annual Effluent Release Reports for 1993, 1994, 1995, and 1996, the release totals and concentrations are as follows:

Nuclide	Total Releases 1993 - 1996 (Ci)	Concentration* (from total releases) Over 207,300 m ² (pCi/g)	PG-8-08 Scenario C Guideline Values (pCi/g per 10 mrem/yr)
Co-60	7.24E-03	1.45E-01	1.86E+00
Cs-134	1.35E-03	2.71E-02	2.87E+00
Cs-137	1.36E-02	2.73E-01	7.48E+00
Eu-152	1.06E-03	2.13E-02	4.25E+00
Eu-154	7.83E-04	1.57E-02	3.90E+00
Eu-155	2.27E-04	4.56E-03	1.42E+02
Fe-55	2.16E-01	4.34E+00	2.40E+04
H-3	5.00E+00	1.00E+02	9.12E+02
*Based on 15 cm deep, 240 kg/m ² per Appendix E-15 in Regulatory Guide 1.109			

This includes all releases of PCRV shield water; previous releases during operations included tritium and some amounts of gamma emitting nuclides; the majority of gamma emitting nuclides released to the environment via liquid effluent releases were made during this decommissioning period. The concentration conservatively assumes all activity was retained uniformly in the area without any migrating to the river as designed.

NRC Comment 2)

Were subsurface samples collected during characterization to support the PSC conclusion that contamination is limited to the surface? If so, please provide the results. If not, please provide additional information supporting this conclusion.

PSCo Response:

Yes. Subsurface samples were collected during the Characterization survey, during the Follow-Up survey, and during the Final survey as a part of the investigation process where elevated concentrations were identified. Summary results of the Characterization survey which included subsurface samples are also provided in the Decommissioning and Remediation Activities section of the Release Record for each Survey Area. The results of the various characterization and Final survey subsurface sampling have been provided in Tables 2-1 through 2-9. Table 2-3 contains results of 21 of the 81 locations where surface and subsurface soil samples were collected in pastures. Table 2-3 represents only those locations where results above background concentrations were observed.

In addition to the following subsurface sample information, an evaluation was performed to determine the contribution to the dose from activity within the region of subsurface samples (0.15 - 0.30 meter depth (i.e. 6 to 12 inches)). The evaluation consisted of RESRAD analysis using the parameters from FSV-TBD-209 as defined in Response 1, and assuming that all nuclides of interest were present at their respective concentration SGLV. The RESRAD analysis was performed with 0 meters of cover depth, and then with 0.15 meters of cover depth. The difference between the resulting doses served to define the shielding factor afforded by the uppermost 0.15 meters of cover depth.

The evaluation showed that activity from all nuclides of interest present at their respective concentration SGLV within the subsurface region contributed only 0.165 of the dose contributed from the same activity present within the 0 - 0.15 meter region. For evaluation of subsurface sample results, FSV-TBD-209 did not account for the shielding afforded by the uppermost 0.15 meters of soil and the dose contributions from related surface and subsurface samples were not summed. Since external exposure is the dominant pathway, to obtain a more accurate approximation of the dose contribution from activity within the region of subsurface samples, each of the resulting doses for the following subsurface samples could be corrected by multiplying the resultant dose by a factor of 0.165.

For the maximum individual surface sample concentration result (obtained from the Goosequill Ditch Banks during Final Survey, sample ID E0002LZZ001G1G02, Location # 00101), including the contribution from the activity within the region of the related subsurface sample would have increased the reported result by approximately 0.2 mrem/yr. For the maximum individual subsurface sample concentration result (obtained from the Sediment Storage Area during Final survey, sample ID E0014LS001G1T01, Location # 00039), including the contribution from the

activity in the related surface sample would have increased the reported result by approximately 0.8 mrem/yr. In all instances, the increase to the reported result caused by summing the surface and subsurface results would not have resulted in an estimated dose in excess of the guideline value.

Table Notes: For the Characterization sample results contained in Tables 2-1 through 2-8, the suffix "SUB" is used to identify the sample as subsurface.

The results contained in Tables 2-1 through 2-8 were not corrected for Cs-137 in the FSV background which was determined to be 0.10 pCi/g in subsurface soils.

Blank cells indicate that values were less than detectable and not reported.

Table 2-1
Comparison of Characterization Survey Surface/Subsurface Sample Results
Goosequill Ditch Banks

Sample Number	Cs-134 pCi/g	Cs-137 pCi/g	Co-60 pCi/g	Eu-152 pCi/g	Eu-154 pCi/g	Eu-155 pCi/g	TEDE mrem/y
GQDB.uR.002	0.243	4.903	0.618	0.169	0.142		3.851
GQDB.SUB.001		0.387	0.073				0.339
GQDB.SED.004	0.642	9.558	3.427	0.972	0.693	0.446	13.384
GQDB.SUB.002		0.180					0.096
GQDB.uR.006	0.145	3.024	6.363	0.744	0.385		14.080
GQDB.SUB.003			0.073				0.130
GQDB.SED.008	0.435	7.065	7.176	1.096	0.753	0.374	18.640
GQDB.SUB.004							
GQDB.uR.011	0.079	1.589	1.534	0.299	0.185	0.238	4.082
GQDB.SUB.005		0.349	0.158				0.469
GQDB.uR.012	0.324	5.596	4.601	0.760	0.505	0.288	12.641
GQDB.SUB.006							
GQDB.SED.010	1.295	18.902	27.676	4.892	2.943	2.003	67.485
GQDB.SUB.007		0.441	0.678				1.450
GQDB.SOIL.021		0.466					0.249
GQDB.SUB.008							
GQDB.SOIL.036		0.971	1.243				2.744
GQDB.SUB.009		0.121	0.135				0.306
GQDB.SED.017	0.372	5.821	2.862	0.544	0.362	0.310	9.428
GQDB.SUB.010		0.694	0.430				1.141

Table 2-2
Comparison of Characterization Survey Surface/Subsurface Sample Results
Jay Thomas Ditch Samples

Sample Number	Cs-134 pCi/g	Cs-137 pCi/g	Co-60 pCi/g	Eu-152 pCi/g	Eu-154 pCi/g	Eu-155 pCi/g	TEDE mrem/y
JT.SOIL.SUR.001		0.100					0.054
JT.SOIL.SUB.001		0.079					0.042
JT.SOIL.SUR.002		0.178					0.095
JT.SOIL.SUB.002		0.064					0.034
JT.SOIL.SUR.003		0.136					0.073
JT.SOIL.SUB.003		0.130					0.069
JT.SOIL.SUR.004		0.267					0.143
JT.SOIL.SUB.004		0.117					0.062
JT.SOIL.SUR.005		0.073					0.039
JT.SOIL.SUB.005		0.076					0.041
JT.SOIL.SUR.006							
JT.SOIL.SUB.006		0.072					0.039
JT.SOIL.SUR.007		0.135					0.072
JT.SOIL.SUB.007		0.107					0.057
JT.SOIL.SUR.008							
JT.SOIL.SUB.008		0.080					0.043
JT.SOIL.SUR.009							
JT.SOIL.SUB.009							
JT.SOIL.SUR.010		0.219					0.117
JT.SOIL.SUB.010							

Table 2-3
Comparison of Characterization Survey Surface/Subsurface Sample Results
Pasture Soil Samples Showing Concentrations above Background

Sample Number	Cs-134 pCi/g	Cs-137 pCi/g	Co-60 pCi/g	Eu-152 pCi/g	Eu-154 pCi/g	Eu-155 pCi/g	TEDE mrem/yr
PAST.SOIL.001.0-6	0.119	3.204	0.960	1.739	1.597		3.584
PAST.SUB.001		0.222					0.119
PAST.SOIL.002.0-6		1.677	0.233				1.314
PAST.SUB.002							
PAST.SOIL.003.0-6		1.102	0.120				0.805
PAST.SUB.003							
PAST.SOIL.006.0-6		0.699	0.214				0.757
PAST.SUB.006		0.215					0.115
PAST.SOIL.008.0-6	0.046	1.384	0.131				1.033
PAST.SUB.008		0.167					0.089
PAST.SOIL.009.0-6	0.022	1.596	0.119				1.095
PAST.SUB.009		0.326					0.174
PAST.SOIL.010.0-6	0.028	1.292	0.130				0.958
PAST.SUB.010		0.629					0.336
PAST.SOIL.011.0-6		0.468					0.250
PAST.SUB.011							
PAST.SOIL.014.0-6		0.495	0.045				0.345
PAST.SUB.014		0.119					0.064
PAST.SOIL.015.0-6		0.199					0.107
PAST.SUB.015		0.143					0.076
PAST.SOIL.017.0-6		0.327	0.032				0.233
PAST.SUB.017		0.087					0.047
PAST.SOIL.022.0-6	0.030	0.880	0.671				1.710
PAST.SUB.022							

Table 2-3 (continued)
Comparison of Characterization Survey Surface/Subsurface Sample Results
Pasture Soil Samples Showing Man Made Nuclides

Sample Number	Cs-134 pCi/g	Cs-137 pCi/g	Co-60 pCi/g	Eu-152 pCi/g	Eu-154 pCi/g	Eu-155 pCi/g	TEDE mrem/yr
PAST.SOIL.023.0-6	0.067	1.410	0.153				1.112
PAST.SUB.023		0.064					0.034
PAST.SOIL.041.0-6		0.666	0.040				0.428
PAST.SUB.041							
PAST.SOIL.049.0-6		0.393	0.049				0.298
PAST.SUB.049		0.961					0.514
PAST.SOIL.050.0-6		0.508	0.057				0.373
PAST.SUB.050		0.118					0.063
PAST.SOIL.051.0-6	0.030	0.795	0.053				0.559
PAST.SUB.051		0.111					0.059
PAST.SOIL.053.0-6		0.942	0.044				0.583
PAST.SUB.053		0.031					0.017
PAST.SOIL.054.0-6		0.705	0.049				0.464
PAST.SUB.054		0.152					0.070
PAST.SOIL.055.0-6	0.017	0.404					0.238
PAST.SUB.055		0.092					0.049
PAST.SOIL.056.0-6	0.030	0.606					0.362
PAST.SUB.056		0.225					0.120

Table 2-4
Comparison of Characterization Survey Surface/Subsurface Sample Results
Farm Pond Outfall Samples

Sample Number	Cs-134 pCi/g	Cs-137 pCi/g	Co-60 pCi/g	Eu-152 pCi/g	Eu-154 pCi/g	Eu-155 pCi/g	TEDE mrem/y
OF.SOIL.SUR.001		0.174					
OF.SOIL.SUB.001		0.051					
OF.SOIL.SUR.002		0.084					
OF.SOIL.SUB.002		0.134					

Table 2-5
Comparison of Follow-Up Survey Surface/Subsurface Sample Results
Goosequill Ditch Banks

Sample Number	Cs-134	Cs-137	Co-60	Eu-152	Eu-154	Eu-155	
	Activity	Activity	Activity	Activity	Activity	Activity	TEDE
	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mrem/yr
GQDB.SOIL.024.XX	0.000	0.188	0.166	0.000	0.000	0.000	0.40
B.SOIL.024.XX.SUB	0.000	0.108	0.075	0.000	0.000	0.000	0.19
GQDB.SOIL.036.XX	0.000	0.826	1.070	0.000	0.000	0.000	2.36
B.SOIL.036.XX.SUB	0.000	0.118	0.100	0.000	0.000	0.000	0.24
GQDB.SED.008.XX	0.000	1.180	1.750	0.287	0.165	0.000	4.12
B.SED.008.XX.SUB	0.000	0.128	0.101	0.000	0.000	0.000	0.25
GQDB.SED.016.XX	0.000	1.470	1.710	0.214	0.118	0.000	4.11
B.SED.016.XX.SUB	0.000	0.596	0.546	0.000	0.000	0.000	1.30
GQDB.SED.018.XX	0.000	1.120	0.051	0.000	0.000	0.000	0.69
B.SED.018.XX.SUB	0.000	0.183	0.055	0.000	0.000	0.000	0.20

Table notes: The value 0.000 in cells for Tables 2-5 through 2-8, indicates that the quantity was less than detectable and not reported

Table 2-6
Comparison of Follow-Up Survey Surface/Subsurface Sample Results
Irrigation Ditches

Sample Number	Cs-134	Cs-137	Co-60	Eu-152	Eu-154	Eu-155	
	Activity	Activity	Activity	Activity	Activity	Activity	TEDE
	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mrem/yr
DTCH.2.001.XX	0.000	0.923	0.588	0.000	0.000	0.000	1.55
DTCH.2.001.XX.SUB	0.000	0.680	0.433	0.000	0.000	0.000	1.14
DTCH.2.002.XX	0.230	5.760	0.713	0.000	0.000	0.000	4.65
DTCH.2.002.XX.SUB	0.124	2.400	0.329	0.000	0.000	0.000	2.03
DTCH.3.002.XX	0.000	1.460	0.189	0.000	0.000	0.000	1.12
DTCH.3.002.XX.SUB	0.000	0.636	0.000	0.000	0.000	0.000	0.34
DTCH.4.002.XX	0.000	0.352	0.312	0.000	0.000	0.000	0.75
DTCH.4.002.XX.SUB	0.000	0.212	0.149	0.000	0.000	0.000	0.38
DTCH.5.014.XX	0.000	1.460	0.196	0.000	0.000	0.000	1.13
DTCH.5.014.XX.SUB	0.000	0.337	0.000	0.000	0.000	0.000	0.18

Table 2-7
Comparison of Follow-Up Survey Surface/Subsurface Sample Results
Permanent Pasture Land

Sample Number	Cs-134	Cs-137	Co-60	Eu-152	Eu-154	Eu-155	
	Activity	Activity	Activity	Activity	Activity	Activity	TEDE
	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mrem/yr
PAST.SOIL.004.XX	0.000	0.506	0.000	0.000	0.000	0.000	0.27
ST.SOIL.004.XX.SUB	0.000	0.000	0.000	0.000	0.000	0.000	0.00
PAST.SOIL.008.XX	0.000	0.628	0.000	0.000	0.000	0.000	0.34
ST.SOIL.008.XX.SUB	0.000	0.584	0.000	0.000	0.000	0.000	0.31
PAST.SOIL.009.XX	0.000	1.010	0.000	0.000	0.000	0.000	0.54
ST.SOIL.009.XX.SUB	0.000	0.000	0.000	0.000	0.000	0.000	0.00
PAST.SOIL.010.XX	0.000	0.393	0.000	0.000	0.000	0.000	0.21
ST.SOIL.010.XX.SUB	0.000	0.000	0.000	0.000	0.000	0.000	0.00
PAST.SOIL.021.XX	0.000	0.711	0.000	0.000	0.000	0.000	0.38
ST.SOIL.021.XX.SUB	0.000	0.228	0.000	0.000	0.000	0.000	0.12
PAST.SOIL.027.XX	0.000	1.140	0.000	0.000	0.000	0.000	0.61
ST.SOIL.027.XX.SUB	0.000	0.000	0.000	0.000	0.000	0.000	0.00
PAST.SOIL.029.XX	0.000	0.843	0.000	0.000	0.000	0.000	0.45
ST.SOIL.029.XX.SUB	0.000	0.085	0.000	0.000	0.000	0.000	0.05
PAST.SOIL.051.XX	0.000	0.607	0.000	0.000	0.000	0.000	0.32
ST.SOIL.051.XX.SUB	0.000	0.120	0.000	0.000	0.000	0.000	0.06
PAST.SOIL.054.XX	0.054	1.360	0.095	0.000	0.000	0.000	0.97
ST.SOIL.054.XX.SUB	0.000	0.289	0.000	0.000	0.000	0.000	0.15
PAST.SOIL.062.XX	0.039	1.420	0.128	0.000	0.000	0.000	1.74
ST.SOIL.062.XX.SUB	0.000	0.145	0.000	0.000	0.000	0.000	0.08

Table 2-8
Comparison of Follow-Up Survey Surface/Subsurface Sample Results
Sediment Storage Area

Sample Number	Cs-134	Cs-137	Co-60	Eu-152	Eu-154	Eu-155	
	Activity	Activity	Activity	Activity	Activity	Activity	TEDE
	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mrem/yr
SSA.SUR.001.XX	0.000	0.458	0.000	0.000	0.000	0.000	0.25
SSA.SUB.001.XX	0.000	0.000	0.000	0.000	0.000	0.000	0.00
SSA.SUR.002.XX	0.000	0.058	0.000	0.000	0.000	0.000	0.03
SSA.SUB.002.XX	0.000	0.000	0.000	0.000	0.000	0.000	0.00
SSA.SUR.003.XX	0.000	1.190	0.604	0.000	0.000	0.000	1.72
SSA.SUB.003.XX	0.096	2.690	1.600	0.000	0.000	0.000	4.42
SSA.SUR.004.XX	0.000	0.000	0.000	0.000	0.000	0.000	0.00
SSA.SUB.004.XX	0.000	0.000	0.000	0.000	0.000	0.000	0.00
SSA.SUR.005.XX	0.000	0.223	0.071	0.000	0.000	0.000	0.25
SSA.SUB.005.XX	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Note: The subsurface sample result obtained at SSA.SUB.003.XX may be characteristic of the Sediment Storage Area. This location was used as a repository for sediment/vegetation removed from the effluent flow path, and as such the activity could be more uniformly distributed at depth.

During the Final survey, subsurface samples were collected at locations where elevated activity was identified as a part of the investigation process. Table 2-9 provides a comparison of the fraction of the SGLV found in surface and related subsurface samples for Final survey samples; and the fraction of the total dose contributed by the subsurface sample. The table demonstrates that the corrected subsurface dose will contribute less than 7% of the total dose for results showing measurable subsurface concentrations. A similar analysis was performed on the area which showed the highest relative subsurface concentrations during characterization surveys (Table 2-6 irrigation ditches) and the resulting subsurface fraction of the total dose was seen to vary between 0.03 and 0.11 (with an average value of 0.05)

Table 2-9
Comparison of the Fraction of Dose from Final Survey
Surface/Subsurface Sample Results

Survey Area	Survey Measurement Location Surface / Subsurface	Fraction of SGLV Surface / Subsurface	Subsurface Fraction of Total Dose
			Uncorrected / Corrected ¹
E0002	22 / 88	0.41 / 0.005	0.01 / 0.00
	25 / 89	0.86 / 0.064	0.07 / 0.01
	29 / 91	0.26 / 0.053	0.17 / 0.03
	30 / 90	0.27 / 0.006	0.02 / 0.00
	40 / 92	0.50 / 0.171	0.25 / 0.04
	95 / 117	2.90 / 0.189	0.06 / 0.01
	100 / 127	2.25 / 0.195	0.08 / 0.01
	101 / 137	2.94 / 0.367	0.11 / 0.02
	102 / 148	1.44 / 0.112	0.07 / 0.01
	103 / 149	1.631 / 0.045	0.03 / 0.00
E0008	47 / 58	1.10 / 0.253	0.19 / 0.04
E0010	28 / 124	0.276 / 0.030	0.10 / 0.02
	29 / 125	0.243 / 0.037	0.13 / 0.02
	71 / 126	0.259 / 0.126	0.33 / 0.07

¹ For evaluation of subsurface sample results, FSV-TBD-209 did not account for the shielding afforded by the uppermost 0.15 meters of soil. Since external exposure is the dominant pathway for exposure, to obtain an approximation of the dose contribution from activity within the region of subsurface samples, each subsurface result could be corrected by multiplying the resultant dose by a factor of 0.165.

Subsurface Fraction of Total (Corrected) =

$$\frac{\text{Subsurface Dose} \times 0.165}{\text{Surface Dose} + (\text{Subsurface Dose} \times 0.165)}$$

NRC Comment 3)

Were each of the soil/sediment samples analyzed for all of the radionuclides listed in Table 7.1? What information was used to select the radionuclides listed in Table 7.1? Why was Sr-90 not included in the table?

PSCo Response:

Final survey samples were not analyzed for iron-55, strontium-90 and tritium due to the relatively low average concentrations identified in the Characterization samples. Twelve samples were analyzed by an offsite lab for Fe-55 and Sr-90. Samples were selected from each segment of the effluent pathway from the samples generally showing the highest concentrations of gamma emitting nuclides. The results of the Characterization survey were reviewed to identify the principal gamma emitting nuclides of interest. The results of these analyses are presented in the following table.

**Table 3-1
Liquid Effluent Pathway Characterization Sample Results**

Sample	Radionuclide	Concentration (pCi/g)	SGLV (pCi/g)	Fraction of SGLV
L3356-1	Fe-55	3.06E+01	2.46E+04	<0.01
	Co-60	8.12E+00	5.58E+00	1.45
	Cs-134	4.29E-01	7.87E+00	0.05
	Cs-137	7.42E+00	1.87E+01	0.40
	Eu-152	1.40E+00	1.32E+01	0.11
	Eu-154	7.50E-01	1.21E+01	0.06
	Eu-155	6.30E-01	4.39E+02	<0.01
	Sr-90	<2.20E-01	9.27E+00	<0.02
	H-3	2.80E-01 ¹	9.12E+02	<0.01
L3356-2	Fe-55	5.40E+00	2.46E+04	<0.01
	Co-60	7.74E-01	5.58E+00	0.14
	Cs-134	8.30E-02	7.87E+00	0.01
	Cs-137	9.20E-01	1.87E+01	0.05
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<2.50E-01	1.21E+01	<0.02
	Eu-155	<1.20E-01	4.39E+02	<0.01
	Sr-90	<1.90E-01	9.27E+00	<0.02
	H-3	<2.10E-01 ¹	9.12E+02	<0.01

Table 3-1 (continued)
Liquid Effluent Pathway Characterization Sample Results

Sample	Radionuclide	Concentration (pCi/g)	SGLV (pCi/g)	Fraction of SGLV
GQD.SED.018	Fe-55	6.82E+01	2.46E+04	<0.01
	Co-60	1.20E+01	5.58E+00	2.15
	Cs-134	5.05E-01	7.87E+00	0.06
	Cs-137	8.36E+00	1.87E+01	0.45
	Eu-152	1.83E+00	1.32E+01	0.14
	Eu-154	7.13E-01	1.21E+01	0.06
	Eu-155	8.03E-01	4.39E+02	<0.01
	Sr-90	<1.28E-01	9.27E+00	<0.01
	H-3	Not analyzed.	9.12E+02	Not analyzed.
GQD.SED.032	Fe-55	2.01E+01	2.46E+04	<0.01
	Co-60	2.63E+01	5.58E+00	4.71
	Cs-134	1.03E+00	7.87E+00	0.13
	Cs-137	1.81E+01	1.87E+01	0.97
	Eu-152	4.24E+00	1.32E+01	0.32
	Eu-154	2.21E+00	1.21E+01	0.18
	Eu-155	1.33E+00	4.39E+02	<0.01
	Sr-90	<1.62E-01	9.27E+00	<0.02
	H-3	Not analyzed.	9.12E+02	Not analyzed.
GQDB.SED.010	Fe-55	1.41E+02	2.46E+04	0.01
	Co-60	2.77E+01	5.58E+00	4.96
	Cs-134	1.30E+00	7.87E+00	0.17
	Cs-137	1.89E+01	1.87E+01	1.01
	Eu-152	4.89E+00	1.32E+01	0.37
	Eu-154	2.94E+00	1.21E+01	0.24
	Eu-155	2.00E+00	4.39E+02	<0.01
	Sr-90	<1.34E-01	9.27E+00	<0.01
	H-3	Not analyzed.	9.12E+02	Not analyzed.
JT.SED.005	Fe-55	2.47E+01	2.46E+04	<0.01
	Co-60	3.85E+00	5.58E+00	0.69
	Cs-134	1.17E-01	7.87E+00	0.02
	Cs-137	2.35E+00	1.87E+01	0.13
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	1.30E-01	9.27E+00	0.01
	H-3	Not analyzed.	9.12E+02	Not analyzed.

Table 3-1 (continued)
Liquid Effluent Pathway Characterization Sample Results

Sample	Radionuclide	Concentration (pCi/g)	SGLV (pCi/g)	Fraction of SGLV
JT.SED.017	Fe-55	1.07E+01	2.46E+04	<0.01
	Co-60	1.34E+00	5.58E+00	0.24
	Cs-134	2.27E-01	7.87E+00	0.03
	Cs-137	3.87E+00	1.87E+01	0.21
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	<1.70E-1	9.27E+00	<0.02
	H-3	Not analyzed.	9.12E+02	Not analyzed.
DTCH.2.001	Fe-55	7.38E+01	2.46E+04	<0.01
	Co-60	2.26E+01	5.58E+00	4.05
	Cs-134	1.06E+00	7.87E+00	0.13
	Cs-137	1.79E+01	1.87E+01	0.96
	Eu-152	3.55E+00	1.32E+01	0.27
	Eu-154	1.98E+00	1.21E+01	0.16
	Eu-155	1.42E+00	4.39E+02	<0.01
	Sr-90	<1.31E-01	9.27E+00	<0.01
	H-3	Not analyzed.	9.12E+02	Not analyzed.
PAST.SOIL.001.0-2	Fe-55	1.69E+01	2.46E+04	<0.01
	Co-60	3.73E+00	5.58E+00	0.67
	Cs-134	6.06E-01	7.87E+00	0.08
	Cs-137	1.05E+01	1.87E+01	0.56
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	2.25E-01	9.27E+00	0.02
	H-3	Not analyzed.	9.12E+02	Not analyzed.
PAST.SOIL.002.0-2	Fe-55	<2.00E+00	2.46E+04	<0.01
	Co-60	1.09E+00	5.58E+00	0.20
	Cs-134	<6.40E-02	7.87E+00	<0.01
	Cs-137	4.62E+00	1.87E+01	0.25
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	1.86E-01	9.27E+00	0.02
	H-3	Not analyzed.	9.12E+02	Not analyzed.

Table 3-1 (continued)
Liquid Effluent Pathway Characterization Sample Results

Sample	Radionuclide	Concentration (pCi/g)	SGLV (pCi/g)	Fraction of SGLV
FP.SED.005.0-3	Fe-55	<2.00E+00	2.46E+04	<0.01
	Co-60	7.66E-01	5.58E+00	0.14
	Cs-134	<6.40E-02	7.87E+00	<0.01
	Cs-137	1.36E+00	1.87E+01	0.07
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	<1.35E-01	9.27E+00	<0.01
	H-3	Not analyzed.	9.12E+02	Not analyzed.
FP.SED.010.0-3	Fe-55	4.35E+00	2.46E+04	<0.01
	Co-60	1.65E-01	5.58E+00	0.03
	Cs-134	<6.40E-02	7.87E+00	<0.01
	Cs-137	3.02E-01	1.87E+01	0.02
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	<1.28E-01	9.27E+00	<0.01
	H-3	Not analyzed.	9.12E+02	Not analyzed.
OF.SED.004	Fe-55	<2.29E+00	2.46E+04	<0.01
	Co-60	0.379	5.58E+00	0.07
	Cs-134	<6.40E-02	7.87E+00	<0.01
	Cs-137	1.91E-01	1.87E+01	0.01
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	<1.64E-01	9.27E+00	<0.02
	H-3	Not analyzed.	9.12E+02	Not analyzed.

Table 3-1 (continued)
Liquid Effluent Pathway Characterization Sample Results

Sample	Radionuclide	Concentration (pCi/g)	SGLV (pCi/g)	Fraction of SGLV
OF.SED.007	Fe-55	5.71E+00	2.46E+04	<0.01
	Co-60	2.30E+00	5.58E+00	0.41
	Cs-134	<6.40E-02	7.87E+00	<0.01
	Cs-137	3.82E-01	1.87E+01	0.02
	Eu-152	<2.40E-01	1.32E+01	<0.02
	Eu-154	<3.00E-01	1.21E+01	<0.02
	Eu-155	<3.00E-01	4.39E+02	<0.01
	Sr-90	<1.66E-01	9.27E+00	<0.02
	H-3	Not analyzed	9.12E+02	Not analyzed.

- 1 For samples L3356-1 and L3356-2, the results for tritium analysis were reported in units of pCi/liter. The results were converted to pCi/g by dividing by 1.0E+03 to provide a conservative estimate of the concentration in soil. These samples were not collected as part of the characterization, they were collected to determine the contribution from HTDN in the effluent pathway in preparation for final surveys.
- 2 Less than values (<) for gamma emitting nuclides Co-60, Cs-134, Cs-137, Eu-152, Eu-154, and Eu-155 represents the *a priori* LLDs @95% confidence level and may not be representative of actual sample MDA. Less than values for Fe-55 and Sr-90 are actual detection limits @ 95% confidence level for individual sample analysis results as reported by the vendor laboratory.

NRC Comment 4)

The characterization data was used as the primary justification for reducing the sample size in the effluent pathway survey units. Please provide the effluent pathway characterization results for NRC review. There is insufficient justification provided for not providing sample frequencies consistent with NUREG/5849 for affected areas. If characterization data meet the same data quality objectives as the final survey, these data can be used as final survey data.

PSCo Response:

A report including the results of the Scoping survey (1994), the Characterization survey (1995) and the Follow-up Characterization survey (1996) has been included as Attachment 3.

Please note that the FSV RESRAD Model had not yet been developed at the time that these surveys were performed and documented. As such, the discussion and conclusions related to comparison of the sample results to the guideline values contained in these reports may not be applicable in all cases. The Scoping Survey Report used Draft NUREG/CR-1500 dose conversion factors (mrem/yr/pCi/g) to estimate the annual TEDE. The Characterization Survey Report used *draft* site-specific model dose conversion factors (which did not become approved) to estimate the annual TEDE. The Follow-up Sampling Report used dose conversion factors from Draft NUREG/CR-1500.

Attachment 3 also includes Final survey results collected at locations where elevated results were observed during characterization surveys, for completeness. The Final survey results exceeding the average guideline value, which required investigation and the use of the averaging protocol, are discussed in the Final Report.

In response to justifying fewer samples than would otherwise be required in affected areas, extensive characterization surveys and the ALARA analysis justify the reduced sampling frequencies. During and following decommissioning releases, approximately 1500 samples were analyzed primarily for gamma emitting nuclides. In addition to the extensive sampling effort, *in situ* measurements were taken with Canberra's Inspector™ system which consists of a Reverse-Electrode intrinsic germanium detector, MCA and the Genie PC software. Measurements were made with the detector face 1 meter from the ground counting for 1200 seconds. Approximately 300 measurements were taken along the FSV effluent pathway and in adjacent areas. Inspector™ measurements frequently formed the basis for sample collection points. Inspector™ measurements were also frequently extended out to the point where the measurement did not show activity other than background nuclides; this is illustrated in Figure C-1 of the Characterization Report. Complete discussions about the Inspector™ measurements can be found in the Fort St. Vrain Liquid Effluent Pathway Scoping Survey Report (5/95) and the Fort St. Vrain Liquid Effluent Pathway Characterization Survey Report (6/95). The wide view of the *in situ* measurements combined with the extensive sampling effort provided PSCo

a high level of confidence that the pathway could be divided into areas with different contamination potential. The characterization efforts showed that although positive results above background could be obtained along the entire length of the pathway there was *minimal risk* associated with the concentrations detected in most areas. Localized areas of activity, were well defined, including the range of expected concentration values. To treat each of the areas along the pathway as affected would have required over 8,000 samples and *cost* over \$1,000,000. The *near term land use* was also given careful consideration and factored into the site-specific model used to evaluate the concentrations. Approximately 840 final survey samples were collected in accordance with the requirements defined in FSV-FRS-TBD-209. Final survey results were consistent with expectations that were formed during characterization surveys.

NRC Comment 5)

Was the potential for groundwater contamination evaluated?

PSCo Response:

Yes. The Radiological Environmental Monitoring Program (REMP) was continued throughout the decommissioning. The 1996 Annual Radiological Environmental Monitoring Report contains the following:

"Ground water was sampled quarterly at two locations. These are F-16, a well on the farm immediately north and the closest to the facility down the hydrological gradient, and at R-5, a well at a personal residence in the town of Milliken, both locations are down the hydrological gradient from the facility. ... "

The groundwater sampling results collected during 1996 identified no licensed gamma emitting radionuclides statistically above the background. Tritium was identified in a limited number of groundwater samples collected from F-16, however the concentrations did not exceed 0.01 of the guideline value for drinking water as determined in FSV-TBD-209.

Surface water samples were also collected from the Farm Pond as a part of the REMF and during the Final survey in 1996. The results of these samples identified no licensed gamma emitting radionuclides statistically above the background.

NRC Comment 6)

The Jay Thomas Ditch was designed as Affected Class 1 this requiring 100% scan. Table 7.4 designates the area as Affected Class 1 but does not reflect the 100% scan for the Jay Thomas Ditch. What is the basis for this discrepancy?

PSCo Response:

The Jay Thomas Ditch is a body of water (stream), and therefore the 100% scan of the water surface for exposure rate would have provided little useful information.

The banks of the Jay Thomas Ditch (Jay Thomas Banks) are composed of soil and were surveyed independently of the stream. A 100% scan for exposure rate was prescribed for The Jay Thomas Banks.

NRC Comment 7)

What is the area of the sediment storage area?

PSCo Response:

The sediment storage area is an irregularly-shaped excavation having a surface area of approximately 125 square meters, and a depth of approximately 1 meter.

Refer to the PSCo Response to NRC Comment 2 for additional information regarding the effect on the exposure estimate for instances where the depth of activity exceeds 0.15 meters.

ATTACHMENT 1

- RESRAD ANALYSIS -

**TEDE Based on Maximum Weighted Mean
100 Square Meter Area, Assumed Uniform Distribution Over 207,300 Square Meters**

Table of Contents

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Part 1: Mixture Sums and Single Radionuclide Guidelines

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Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	8
Contaminated Zone and Total Dose Summary	9
Total Dose Components	
Time = 0.000E+00	10
Time = 1.000E+00	11
Time = 2.000E+00	12
Time = 3.000E+00	13
Time = 4.000E+00	14
Time = 5.000E+00	15
Time = 6.000E+00	16
Time = 7.000E+00	17
Time = 8.000E+00	18
Time = 9.000E+00	19
Dose/Source Ratios Summed Over All Pathways	20
Single Radionuclide Soil Guidelines	20
Dose Per Nuclide Summed Over All Pathways	21
Soil Concentration Per Nuclide	21

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

Menu	Parameter	Current Value	Default	Parameter Name

B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Co-60	2.190E-04	2.190E-04	DCF2(1)
B-1	Cs-134	4.630E-05	4.630E-05	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(4)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(6)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(7)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(8)

D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Co-60	2.690E-05	2.690E-05	DCF3(1)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(4)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(6)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(7)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(8)

D-34	Food transfer factors:			
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(1,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(1,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(1,3)

D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(2,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(2,3)

D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)

D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(4,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(4,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(4,3)

D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(6,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,3)

D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(7,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(7,3)

D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(8,3)

D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(1,2)
D-5				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(2,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(7,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(7,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(8,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.073E+05	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	2.650E+03	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	2.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E+00	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E+00	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E+00	1.000E+02	---	T(6)
R011	Times for calculations (yr)	6.000E+00	3.000E+02	---	T(7)
R011	Times for calculations (yr)	7.000E+00	1.000E+03	---	T(8)
R011	Times for calculations (yr)	8.000E+00	0.000E+00	---	T(9)
R011	Times for calculations (yr)	9.000E+00	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Co-60	1.527E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Cs-134	1.484E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	4.282E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Eu-152	1.737E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Eu-154	8.170E-02	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Eu-155	3.690E-02	0.000E+00	---	S1(7)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Cs-134	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Eu-152	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Eu-154	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Eu-155	not used	0.000E+00	---	W1(7)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVERO
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	5.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.000E+00	2.000E-01	---	RI
R013	Irrigation mode	ditch	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.111E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.111E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.111E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Eu-154				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCC(6)
R016	Unsat. zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name

R016	Distribution coefficients for Eu-155				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)

R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

R017	Inhalation rate (m**3/yr)	1.051E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	3.300E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.500E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	1 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
=====					
R018	Fruits, vegetables and grain consumption (kg/yr)	1.660E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.100E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.000E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.825E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.100E+01	FMEAT
R018	Contamination fraction of milk	-1	-1	0.100E+01	FMILK
=====					
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LF15
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LW15
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LW16
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LS1
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
=====					
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
=====					
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
=====					

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions	Initial Soil Concentrations, pCi/g
Area: 207300.00 square meters	Co-60 1.527E+00
Thickness: 0.15 meters	Cs-134 1.484E-01
Cover Depth: 0.00 meters	Cs-137 4.282E+00
	Eu-152 1.737E-01
	Eu-154 8.170E-02
	Eu-155 3.690E-02

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 10 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	6.000E+00	7.000E+00	8.000E+00	9.000E+00
TDOSE(t):	1.509E+01	1.368E+01	1.246E+01	1.140E+01	1.047E+01	9.644E+00	8.916E+00	8.270E+00	7.695E+00	7.180E+00
M(t):	1.509E+00	1.368E+00	1.246E+00	1.140E+00	1.047E+00	9.644E-01	8.916E-01	8.270E-01	7.695E-01	7.180E-01

Maximum TDOSE(t): 1.509E+01 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	8.097E+00	0.5367	3.388E-04	0.0000	0.000E+00	0.0000	4.827E-02	0.0032	7.164E-02	0.0047	1.005E-02	0.0007	5.698E-04	0.0000
Cs-134	4.842E-01	0.0321	6.959E-06	0.0000	0.000E+00	0.0000	6.347E-03	0.0004	1.891E-02	0.0013	7.419E-03	0.0005	1.509E-04	0.0000
Cs-137	5.058E+00	0.3352	1.383E-04	0.0000	0.000E+00	0.0000	1.263E-01	0.0084	3.855E-01	0.0256	1.485E-01	0.0098	2.969E-03	0.0002
Eu-152	4.089E-01	0.0271	3.888E-05	0.0000	0.000E+00	0.0000	4.209E-05	0.0000	7.496E-05	0.0000	1.180E-06	0.0000	1.561E-05	0.0000
Eu-154	2.096E-01	0.0139	2.367E-05	0.0000	0.000E+00	0.0000	2.915E-05	0.0000	5.188E-05	0.0000	8.179E-07	0.0000	1.082E-05	0.0000
Eu-155	2.594E-03	0.0002	1.547E-06	0.0000	0.000E+00	0.0000	2.105E-06	0.0000	3.740E-06	0.0000	5.915E-08	0.0000	7.831E-07	0.0000
Total	1.426E+01	0.9452	5.481E-04	0.0000	0.000E+00	0.0000	1.810E-01	0.0120	4.762E-01	0.0316	1.660E-01	0.0110	3.717E-03	0.0002

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.228E+00	0.5453
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.170E-01	0.0343
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.722E+00	0.3792
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.091E-01	0.0271
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-01	0.0139
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.603E-03	0.0002
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.509E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	7.062E+00	0.5161	2.941E-04	0.0000	0.000E+00	0.0000	4.191E-02	0.0031	6.220E-02	0.0045	8.723E-03	0.0006	4.948E-04	0.0000
Cs-134	3.443E-01	0.0252	4.924E-06	0.0000	0.000E+00	0.0000	4.491E-03	0.0003	1.338E-02	0.0010	5.249E-03	0.0004	1.068E-04	0.0000
Cs-137	4.919E+00	0.3595	1.339E-04	0.0000	0.000E+00	0.0000	1.222E-01	0.0089	3.730E-01	0.0273	1.437E-01	0.0105	2.873E-03	0.0002
Eu-152	3.853E-01	0.0282	3.647E-05	0.0000	0.000E+00	0.0000	3.948E-05	0.0000	7.031E-05	0.0000	1.107E-06	0.0000	1.464E-05	0.0000
Eu-154	1.923E-01	0.0141	2.161E-05	0.0000	0.000E+00	0.0000	2.662E-05	0.0000	4.737E-05	0.0000	7.469E-07	0.0000	9.882E-06	0.0000
Eu-155	2.243E-03	0.0002	1.329E-06	0.0000	0.000E+00	0.0000	1.808E-06	0.0000	3.213E-06	0.0000	5.082E-08	0.0000	6.727E-07	0.0000
Total	1.291E+01	0.9431	4.923E-04	0.0000	0.000E+00	0.0000	1.687E-01	0.0123	4.488E-01	0.0328	1.577E-01	0.0115	3.500E-03	0.0003

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.176E+00	0.5244
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.675E-01	0.0269
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.561E+00	0.4064
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.855E-01	0.0282
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.924E-01	0.0141
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.250E-03	0.0002
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.368E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 2.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	6.159E+00	0.4941	2.554E-04	0.0000	0.000E+00	0.0000	3.639E-02	0.0029	5.400E-02	0.0043	7.573E-03	0.0006	4.295E-04	0.0000
Cs-134	2.448E-01	0.0196	3.484E-06	0.0000	0.000E+00	0.0000	3.177E-03	0.0003	9.465E-03	0.0008	3.714E-03	0.0003	7.553E-05	0.0000
Cs-137	4.783E+00	0.3837	1.295E-04	0.0000	0.000E+00	0.0000	1.183E-01	0.0095	3.610E-01	0.0290	1.391E-01	0.0112	2.780E-03	0.0002
Eu-152	3.631E-01	0.0291	3.420E-05	0.0000	0.000E+00	0.0000	3.703E-05	0.0000	6.594E-05	0.0000	1.038E-06	0.0000	1.373E-05	0.0000
Eu-154	1.764E-01	0.0142	1.973E-05	0.0000	0.000E+00	0.0000	2.431E-05	0.0000	4.326E-05	0.0000	6.820E-07	0.0000	9.023E-06	0.0000
Eu-155	1.939E-03	0.0002	1.142E-06	0.0000	0.000E+00	0.0000	1.553E-06	0.0000	2.760E-06	0.0000	4.366E-08	0.0000	5.779E-07	0.0000
Total	1.173E+01	0.9409	4.434E-04	0.0000	0.000E+00	0.0000	1.579E-01	0.0127	4.245E-01	0.0341	1.503E-01	0.0121	3.309E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 2.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.258E+00	0.5020
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.612E-01	0.0210
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.404E+00	0.4336
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.632E-01	0.0291
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.765E-01	0.0142
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.946E-03	0.0002
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E+01	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	5.371E+00	0.4711	2.217E-04	0.0000	0.000E+00	0.0000	3.159E-02	0.0028	4.688E-02	0.0041	6.574E-03	0.0006	3.729E-04	0.0000
Cs-134	1.740E-01	0.0153	2.465E-06	0.0000	0.000E+00	0.0000	2.248E-03	0.0002	6.697E-03	0.0006	2.627E-03	0.0002	5.343E-05	0.0000
Cs-137	4.651E+00	0.4080	1.253E-04	0.0000	0.000E+00	0.0000	1.144E-01	0.0100	3.492E-01	0.0306	1.345E-01	0.0118	2.690E-03	0.0002
Eu-152	3.421E-01	0.0300	3.207E-05	0.0000	0.000E+00	0.0000	3.473E-05	0.0000	6.184E-05	0.0000	9.736E-07	0.0000	1.288E-05	0.0000
Eu-154	1.619E-01	0.0142	1.802E-05	0.0000	0.000E+00	0.0000	2.219E-05	0.0000	3.950E-05	0.0000	6.227E-07	0.0000	8.239E-06	0.0000
Eu-155	1.677E-03	0.0001	9.810E-07	0.0000	0.000E+00	0.0000	1.334E-06	0.0000	2.371E-06	0.0000	3.750E-08	0.0000	4.965E-07	0.0000
Total	1.070E+01	0.9387	4.005E-04	0.0000	0.000E+00	0.0000	1.483E-01	0.0130	4.029E-01	0.0353	1.437E-01	0.0126	3.138E-03	0.0003

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.457E+00	0.4786
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-01	0.0163
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.252E+00	0.4607
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.423E-01	0.0300
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.619E-01	0.0142
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.682E-03	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.140E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	4.684E+00	0.4475	1.924E-04	0.0000	0.000E+00	0.0000	2.742E-02	0.0026	4.070E-02	0.0039	5.707E-03	0.0005	3.237E-04	0.0000
Cs-134	1.237E-01	0.0118	1.744E-06	0.0000	0.000E+00	0.0000	1.590E-03	0.0002	4.738E-03	0.0005	1.859E-03	0.0002	3.780E-05	0.0000
Cs-137	4.522E+00	0.4321	1.212E-04	0.0000	0.000E+00	0.0000	1.107E-01	0.0106	3.379E-01	0.0323	1.302E-01	0.0124	2.603E-03	0.0002
Eu-152	3.224E-01	0.0308	3.008E-05	0.0000	0.000E+00	0.0000	3.257E-05	0.0000	5.800E-05	0.0000	9.130E-07	0.0000	1.208E-05	0.0000
Eu-154	1.485E-01	0.0142	1.645E-05	0.0000	0.000E+00	0.0000	2.026E-05	0.0000	3.606E-05	0.0000	5.685E-07	0.0000	7.522E-06	0.0000
Eu-155	1.450E-03	0.0001	8.427E-07	0.0000	0.000E+00	0.0000	1.146E-06	0.0000	2.037E-06	0.0000	3.222E-08	0.0000	4.265E-07	0.0000
Total	9.802E+00	0.9365	3.628E-04	0.0000	0.000E+00	0.0000	1.398E-01	0.0134	3.834E-01	0.0366	1.377E-01	0.0132	2.984E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.758E+00	0.4546
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.320E-01	0.0126
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.104E+00	0.4876
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.225E-01	0.0308
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.486E-01	0.0142
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.454E-03	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	~~~~~		~~~~~		~~~~~		~~~~~		~~~~~		~~~~~		~~~~~	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
Co-60	4.084E+00	0.4235	1.671E-04	0.0000	0.000E+00	0.0000	2.381E-02	0.0025	3.533E-02	0.0037	4.954E-03	0.0005	2.810E-04	0.0000
Cs-134	8.796E-02	0.0091	1.233E-06	0.0000	0.000E+00	0.0000	1.125E-03	0.0001	3.351E-03	0.0003	1.315E-03	0.0001	2.674E-05	0.0000
Cs-137	4.397E+00	0.4560	1.173E-04	0.0000	0.000E+00	0.0000	1.071E-01	0.0111	3.269E-01	0.0339	1.259E-01	0.0131	2.518E-03	0.0003
Eu-152	3.037E-01	0.0315	2.821E-05	0.0000	0.000E+00	0.0000	3.054E-05	0.0000	5.439E-05	0.0000	8.562E-07	0.0000	1.133E-05	0.0000
Eu-154	1.362E-01	0.0141	1.502E-05	0.0000	0.000E+00	0.0000	1.850E-05	0.0000	3.292E-05	0.0000	5.190E-07	0.0000	6.868E-06	0.0000
Eu-155	1.253E-03	0.0001	7.238E-07	0.0000	0.000E+00	0.0000	9.847E-07	0.0000	1.750E-06	0.0000	2.767E-08	0.0000	3.663E-07	0.0000
~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
Total	9.011E+00	0.9343	3.295E-04	0.0000	0.000E+00	0.0000	1.321E-01	0.0137	3.657E-01	0.0379	1.322E-01	0.0137	2.844E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	~~~~~		~~~~~		~~~~~		~~~~~		~~~~~		~~~~~		~~~~~	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.149E+00	0.4302
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.378E-02	0.0097
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.960E+00	0.5143
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.039E-01	0.0315
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.363E-01	0.0141
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.257E-03	0.0001
~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.644E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 6.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio- Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	3.562E+00	0.3994	1.450E-04	0.0000	0.000E+00	0.0000	2.066E-02	0.0023	3.067E-02	0.0034	4.300E-03	0.0005	2.439E-04	0.0000
Cs-134	6.253E-02	0.0070	8.725E-07	0.0000	0.000E+00	0.0000	7.958E-04	0.0001	2.371E-03	0.0003	9.302E-04	0.0001	1.892E-05	0.0000
Cs-137	4.275E+00	0.4795	1.135E-04	0.0000	0.000E+00	0.0000	1.036E-01	0.0116	3.162E-01	0.0355	1.218E-01	0.0137	2.436E-03	0.0003
Eu-152	2.862E-01	0.0321	2.645E-05	0.0000	0.000E+00	0.0000	2.864E-05	0.0000	5.100E-05	0.0000	8.029E-07	0.0000	1.062E-05	0.0000
Eu-154	1.249E-01	0.0140	1.371E-05	0.0000	0.000E+00	0.0000	1.689E-05	0.0000	3.006E-05	0.0000	4.739E-07	0.0000	6.270E-06	0.0000
Eu-155	1.084E-03	0.0001	6.217E-07	0.0000	0.000E+00	0.0000	8.457E-07	0.0000	1.503E-06	0.0000	2.377E-08	0.0000	3.147E-07	0.0000
Total	8.312E+00	0.9322	3.001E-04	0.0000	0.000E+00	0.0000	1.251E-01	0.0140	3.494E-01	0.0392	1.271E-01	Total	8.312E+00	0.9322

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 6.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio- Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.618E+00	0.4057
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.665E-02	0.0075
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.820E+00	0.5405
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.863E-01	0.0321
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E-01	0.0140
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.087E-03	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.916E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	3.106E+00	0.3755	1.259E-04	0.0000	0.000E+00	0.0000	1.794E-02	0.0022	2.662E-02	0.0032	3.733E-03	0.0005	2.117E-04	0.0000
Cs-134	4.445E-02	0.0054	6.172E-07	0.0000	0.000E+00	0.0000	5.629E-04	0.0001	1.677E-03	0.0002	6.579E-04	0.0001	1.338E-05	0.0000
Cs-137	4.157E+00	0.5026	1.098E-04	0.0000	0.000E+00	0.0000	1.002E-01	0.0121	3.059E-01	0.0370	1.178E-01	0.0142	2.356E-03	0.0003
Eu-152	2.696E-01	0.0326	2.480E-05	0.0000	0.000E+00	0.0000	2.685E-05	0.0000	4.782E-05	0.0000	7.528E-07	0.0000	9.959E-06	0.0000
Eu-154	1.146E-01	0.0139	1.252E-05	0.0000	0.000E+00	0.0000	1.542E-05	0.0000	2.744E-05	0.0000	4.326E-07	0.0000	5.724E-06	0.0000
Eu-155	9.368E-04	0.0001	5.340E-07	0.0000	0.000E+00	0.0000	7.264E-07	0.0000	1.291E-06	0.0000	2.041E-08	0.0000	2.703E-07	0.0000
Total	7.692E+00	0.9301	2.741E-04	0.0000	0.000E+00	0.0000	1.188E-01	0.0144	3.343E-01	0.0404	1.222E-01	0.0148	2.597E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.154E+00	0.3814
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.737E-02	0.0057
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.683E+00	0.5663
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.697E-01	0.0326
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.147E-01	0.0139
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.397E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.270E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 8.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio- Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	2.708E+00	0.3519	1.092E-04	0.0000	0.000E+00	0.0000	1.557E-02	0.0020	2.310E-02	0.0030	3.240E-03	0.0004	1.838E-04	0.0000
Cs-134	3.160E-02	0.0041	4.365E-07	0.0000	0.000E+00	0.0000	3.981E-04	0.0001	1.186E-03	0.0002	4.654E-04	0.0001	9.464E-06	0.0000
Cs-137	4.041E+00	0.5252	1.062E-04	0.0000	0.000E+00	0.0000	9.697E-02	0.0126	2.959E-01	0.0385	1.140E-01	0.0148	2.279E-03	0.0003
Eu-152	2.540E-01	0.0330	2.325E-05	0.0000	0.000E+00	0.0000	2.518E-05	0.0000	4.483E-05	0.0000	7.058E-07	0.0000	9.337E-06	0.0000
Eu-154	1.051E-01	0.0137	1.143E-05	0.0000	0.000E+00	0.0000	1.407E-05	0.0000	2.505E-05	0.0000	3.949E-07	0.0000	5.225E-06	0.0000
Eu-155	8.099E-04	0.0001	4.586E-07	0.0000	0.000E+00	0.0000	6.239E-07	0.0000	1.108E-06	0.0000	1.753E-08	0.0000	2.321E-07	0.0000
Total	7.141E+00	0.9280	2.510E-04	0.0000	0.000E+00	0.0000	1.130E-01	0.0147	3.203E-01	0.0416	1.177E-01	0.0153	2.487E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 8.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio- Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.750E+00	0.3574
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.366E-02	0.0044
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.551E+00	0.5914
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.541E-01	0.0330
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.052E-01	0.0137
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.124E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.695E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 9.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	2.361E+00	0.3288	9.481E-05	0.0000	0.000E+00	0.0000	1.351E-02	0.0019	2.005E-02	0.0028	2.812E-03	0.0004	1.595E-04	0.0000
Cs-134	2.246E-02	0.0031	3.087E-07	0.0000	0.000E+00	0.0000	2.816E-04	0.0000	8.389E-04	0.0001	3.291E-04	0.0000	6.694E-06	0.0000
Cs-137	3.929E+00	0.5472	1.027E-04	0.0000	0.000E+00	0.0000	9.380E-02	0.0131	2.862E-01	0.0399	1.103E-01	0.0154	2.205E-03	0.0003
Eu-152	2.393E-01	0.0333	2.180E-05	0.0000	0.000E+00	0.0000	2.360E-05	0.0000	4.204E-05	0.0000	6.618E-07	0.0000	8.754E-06	0.0000
Eu-154	9.641E-02	0.0134	1.043E-05	0.0000	0.000E+00	0.0000	1.285E-05	0.0000	2.286E-05	0.0000	3.604E-07	0.0000	4.769E-06	0.0000
Eu-155	7.002E-04	0.0001	3.939E-07	0.0000	0.000E+00	0.0000	5.358E-07	0.0000	9.520E-07	0.0000	1.506E-08	0.0000	1.993E-07	0.0000
Total	6.649E+00	0.9261	2.305E-04	0.0000	0.000E+00	0.0000	1.076E-01	0.0150	3.072E-01	0.0428	1.134E-01	0.0158	2.385E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 9.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.398E+00	0.3339
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.392E-02	0.0033
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.422E+00	0.6159
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.394E-01	0.0333
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.647E-02	0.0134
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.023E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.180E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Parent	Product	Branch	DSR(j,t) (mrem/yr)/(pCi/g)											
(i)	(j)	Fraction	t=	0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	6.000E+00	7.000E+00	8.000E+00	9.000E+00	
#####	#####	#####		#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	
Co-60	Co-60	1.000E+00		5.388E+00	4.698E+00	4.097E+00	3.573E+00	3.115E+00	2.717E+00	2.369E+00	2.065E+00	1.801E+00	1.570E+00	
Cs-134	Cs-134	1.000E+00		3.484E+00	2.476E+00	1.760E+00	1.251E+00	8.892E-01	6.319E-01	4.491E-01	3.192E-01	2.268E-01	1.612E-01	
Cs-137	Cs-137	1.000E+00		1.336E+00	1.299E+00	1.262E+00	1.227E+00	1.192E+00	1.158E+00	1.124E+00	1.094E+00	1.063E+00	1.033E+00	
Eu-152	Eu-152	7.208E-01		1.698E+00	1.600E+00	1.507E+00	1.420E+00	1.338E+00	1.261E+00	1.188E+00	1.119E+00	1.055E+00	9.935E-01	
Eu-152	Eu-152	2.792E-01		6.575E-01	6.196E-01	5.839E-01	5.502E-01	5.184E-01	4.884E-01	4.602E-01	4.336E-01	4.085E-01	3.848E-01	
Eu-152	Gd-152	2.792E-01		0.000E+00	4.588E-16	8.825E-16	1.274E-15	1.636E-15	1.970E-15	2.278E-15	2.561E-15	2.822E-15	3.060E-15	
Eu-152	DSR(j)			6.575E-01	6.196E-01	5.839E-01	5.502E-01	5.184E-01	4.884E-01	4.602E-01	4.336E-01	4.085E-01	3.848E-01	
Eu-154	Eu-154	1.000E+00		2.567E+00	2.355E+00	2.161E+00	1.982E+00	1.818E+00	1.668E+00	1.530E+00	1.403E+00	1.287E+00	1.181E+00	
Eu-155	Eu-155	1.000E+00		7.053E-02	6.098E-02	5.272E-02	4.558E-02	3.941E-02	3.407E-02	2.946E-02	2.547E-02	2.202E-02	1.903E-02	
#####	#####	#####		#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	
Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).														
The DSR includes contributions from associated (half-life μ 0.5 yr) daughters.														

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 Basic Radiation Dose Limit = 10 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	6.000E+00	7.000E+00	8.000E+00	9.000E+00
Co-60		1.856E+00	2.128E+00	2.441E+00	2.799E+00	3.210E+00	3.681E+00	4.222E+00	4.842E+00	5.554E+00	6.370E+00
Cs-134		2.870E+00	4.038E+00	5.681E+00	7.993E+00	1.125E+01	1.582E+01	2.227E+01	3.133E+01	4.409E+01	6.204E+01
Cs-137		7.484E+00	7.700E+00	7.923E+00	8.153E+00	8.389E+00	8.633E+00	8.884E+00	9.143E+00	9.409E+00	9.684E+00
Eu-152		4.246E+00	4.506E+00	4.782E+00	5.075E+00	5.386E+00	5.716E+00	6.067E+00	6.440E+00	6.835E+00	7.255E+00
Eu-154		3.895E+00	4.246E+00	4.628E+00	5.045E+00	5.499E+00	5.995E+00	6.536E+00	7.125E+00	7.768E+00	8.469E+00
Eu-155		1.418E+02	1.640E+02	1.897E+02	2.194E+02	2.537E+02	2.935E+02	3.395E+02	3.927E+02	4.542E+02	5.254E+02

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

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Co-60	1.527E+00	0.000E+00	5.388E+00	1.856E+00	5.388E+00	1.856E+00
Cs-134	1.484E-01	0.000E+00	3.484E+00	2.870E+00	3.484E+00	2.870E+00
Cs-137	4.282E+00	0.000E+00	1.336E+00	7.484E+00	1.336E+00	7.484E+00
Eu-152	1.737E-01	0.000E+00	2.355E+00	4.246E+00	2.355E+00	4.246E+00
Eu-154	8.170E-02	0.000E+00	2.567E+00	3.895E+00	2.567E+00	3.895E+00
Eu-155	3.690E-02	0.000E+00	7.053E-02	1.418E+02	7.053E-02	1.418E+02

Nuclide	Parent	BRF(i)	S(j,t), pCi/g									
(j)	(i)		t= 0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	6.000E+00	7.000E+00	8.000E+00	9.000E+00
Co-60	Co-60	1.000E+00	1.527E+00	1.335E+00	1.167E+00	1.020E+00	8.914E-01	7.791E-01	6.810E-01	5.952E-01	5.203E-01	4.547E-01
Cs-134	Cs-134	1.000E+00	1.484E-01	1.057E-01	7.529E-02	5.363E-02	3.820E-02	2.721E-02	1.938E-02	1.381E-02	9.834E-03	7.004E-03
Cs-137	Cs-137	1.000E+00	4.282E+00	4.171E+00	4.063E+00	3.958E+00	3.856E+00	3.756E+00	3.659E+00	3.564E+00	3.472E+00	3.382E+00
Eu-152	Eu-152	7.208E-01	1.252E-01	1.182E-01	1.116E-01	1.054E-01	9.952E-02	9.397E-02	8.872E-02	8.377E-02	7.910E-02	7.469E-02
Eu-152	Eu-152	2.792E-01	4.850E-02	4.579E-02	4.324E-02	4.083E-02	3.855E-02	3.640E-02	3.437E-02	3.245E-02	3.064E-02	2.893E-02
Eu-152	BS(j):		1.737E-01	1.640E-01	1.549E-01	1.462E-01	1.381E-01	1.304E-01	1.231E-01	1.162E-01	1.097E-01	1.036E-01
Gd-152	Eu-152	2.792E-01	0.000E+00	3.017E-16	5.849E-16	8.507E-16	1.100E-15	1.334E-15	1.553E-15	1.759E-15	1.951E-15	2.131E-15
Eu-154	Eu-154	1.000E+00	8.170E-02	7.510E-02	6.904E-02	6.347E-02	5.835E-02	5.364E-02	4.931E-02	4.533E-02	4.167E-02	3.830E-02
Eu-155	Eu-155	1.000E+00	3.690E-02	3.191E-02	2.771E-02	2.387E-02	2.065E-02	1.786E-02	1.545E-02	1.336E-02	1.155E-02	9.993E-03

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

ATTACHMENT 2

- RESR 'D ANALYSIS -

**TEDE Based on Highest Survey Unit Average (UCL) Concentration
Assumed Uniform Distribution Over 207,300 Square Meters**

Table of Contents

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Part 1: Mixture Sums and Single Radionuclide Guidelines

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Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	8
Contaminated Zone and Total Dose Summary	9
Total Dose Components	
Time = 0.000E+00	10
Time = 1.000E+00	11
Time = 2.000E+00	12
Time = 3.000E+00	13
Time = 4.000E+00	14
Time = 5.000E+00	15
Time = 6.000E+00	16
Time = 7.000E+00	17
Time = 8.000E+00	18
Time = 9.000E+00	19
Dose/Source Ratios Summed Over All Pathways	20
Single Radionuclide Soil Guidelines	20
Dose Per Nuclide Summed Over All Pathways	21
Soil Concentration Per Nuclide	21

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

Menu	Parameter	Current Value	Default	Parameter Name

B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Co-60	2.190E-04	2.190E-04	DCF2(1)
B-1	Cs-134	4.630E-05	4.630E-05	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(4)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(6)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(7)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Co-60	2.690E-05	2.690E-05	DCF3(1)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(4)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(6)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(7)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(1,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(1,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(1,3)
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(2,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(2,3)
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(3,3)
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(4,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(4,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(4,3)
D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(6,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,3)
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(7,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(7,3)
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(1,2)

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

Menu	Parameter	Current Value	Default	Parameter Name
=====				
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(2,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(7,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(7,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(8,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)
=====				

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
=====					
R011	Area of contaminated zone (m**2)	2.073E+05	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	2.650E+03	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	T1
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	2.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E+00	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E+00	3.000E+01	---	T(5)
R011	Times for calculations (yr)	5.000E+00	1.000E+02	---	T(6)
R011	Times for calculations (yr)	6.000E+00	3.000E+02	---	T(7)
R011	Times for calculations (yr)	7.000E+00	1.000E+03	---	T(8)
R011	Times for calculations (yr)	8.000E+00	0.000E+00	---	T(9)
R011	Times for calculations (yr)	9.000E+00	0.000E+00	---	T(10)
=====					
R012	Initial principal radionuclide (pCi/g): Co-60	5.992E-01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Cs-134	9.871E-02	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	2.879E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Eu-152	4.325E-02	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Eu-154	1.257E-02	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Eu-155	1.117E-02	0.000E+00	---	S1(7)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Cs-134	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Eu-152	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Eu-154	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Eu-155	not used	0.000E+00	---	W1(7)
=====					
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	5.000E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.000E+00	2.000E-01	---	RI
R013	Irrigation mode	ditch	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
=====					
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.111E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.111E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.111E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	1.000E+00	1.000E+00	5.758E+02	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	1.000E+00	1.000E+00	5.758E+02	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	1.000E+00	1.000E+00	5.758E+02	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Eu-154				
R016	Contaminated zone (cm**3/g)	1.000E+00	1.000E+00	5.758E+02	DCNUCC(6)
R016	Unsat. zone 1 (cm**3/g)	1.000E+00	1.000E+00	5.758E+02	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	1.000E+00	1.000E+00	5.758E+02	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name

R016	Distribution coefficients for Eu-155				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.402E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	1.051E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	3.300E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.500E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	1 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Fruits, vegetables and grain consumption (kg/yr)	1.660E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.100E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.000E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.825E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.100E+01	FMEAT
R018	Contamination fraction of milk	-1	-1	0.100E+01	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LF15
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LW15
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LW16
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LS1
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

Contaminated Zone Dimensions	Initial Soil Concentrations, pCi/g	
Area: 207300.00 square meters	Co-60	5.992E-01
Thickness: 0.15 meters	Cs-134	9.871E-02
Cover Depth: 0.00 meters	Cs-137	2.879E+00
	Eu-152	4.325E-02
	Eu-154	1.257E-02
	Eu-155	1.117E-02

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 10 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	6.000E+00	7.000E+00	8.000E+00	9.000E+00
TDOSE(t):	7.554E+00	6.925E+00	6.381E+00	5.906E+00	5.490E+00	5.122E+00	4.795E+00	4.503E+00	4.241E+00	4.004E+00
M(t):	7.554E-01	6.925E-01	6.381E-01	5.906E-01	5.490E-01	5.122E-01	4.795E-01	4.503E-01	4.241E-01	4.004E-01

Maximum TDOSE(t): 7.554E+00 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	3.177E+00	0.4205	1.329E-04	0.0000	0.000E+00	0.0000	1.894E-02	0.0025	2.811E-02	0.0037	3.941E-03	0.0005	2.236E-04	0.0000
Cs-134	3.220E-01	0.0426	4.629E-06	0.0000	0.000E+00	0.0000	4.222E-03	0.0006	1.258E-02	0.0017	4.935E-03	0.0007	1.004E-04	0.0000
Cs-137	3.401E+00	0.4502	9.302E-05	0.0000	0.000E+00	0.0000	8.494E-02	0.0112	2.592E-01	0.0343	9.986E-02	0.0132	1.997E-03	0.0003
Eu-152	1.018E-01	0.0135	9.681E-06	0.0000	0.000E+00	0.0000	1.048E-05	0.0000	1.867E-05	0.0000	2.939E-07	0.0000	3.887E-06	0.0000
Eu-154	3.225E-02	0.0043	3.641E-06	0.0000	0.000E+00	0.0000	4.485E-06	0.0000	7.982E-06	0.0000	1.258E-07	0.0000	1.665E-06	0.0000
Eu-155	7.854E-04	0.0001	4.684E-07	0.0000	0.000E+00	0.0000	6.371E-07	0.0000	1.132E-06	0.0000	1.791E-08	0.0000	2.370E-07	0.0000
Total	7.035E+00	0.9312	2.443E-04	0.0000	0.000E+00	0.0000	1.081E-01	0.0143	2.999E-01	0.0397	1.087E-01	0.0144	2.326E-03	0.0003

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.228E+00	0.4273
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.439E-01	0.0455
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.847E+00	0.5093
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-01	0.0135
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.227E-02	0.0043
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.879E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.554E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Co-60	2.771E+00	0.4001	1.154E-04	0.0000	0.000E+00	0.0000	1.644E-02	0.0024	2.440E-02	0.0035	3.422E-03	0.0005	1.941E-04	0.0000
Cs-134	2.290E-01	0.0331	3.275E-06	0.0000	0.000E+00	0.0000	2.987E-03	0.0004	8.899E-03	0.0013	3.491E-03	0.0005	7.101E-05	0.0000
Cs-137	3.307E+00	0.4776	9.000E-05	0.0000	0.000E+00	0.0000	8.220E-02	0.0119	2.508E-01	0.0362	9.663E-02	0.0140	1.932E-03	0.0003
Eu-152	9.594E-02	0.0139	9.080E-06	0.0000	0.000E+00	0.0000	9.830E-06	0.0000	1.751E-05	0.0000	2.756E-07	0.0000	3.646E-06	0.0000
Eu-154	2.959E-02	0.0043	3.325E-06	0.0000	0.000E+00	0.0000	4.095E-06	0.0000	7.288E-06	0.0000	1.149E-07	0.0000	1.520E-06	0.0000
Eu-155	6.790E-04	0.0001	4.024E-07	0.0000	0.000E+00	0.0000	5.474E-07	0.0000	9.726E-07	0.0000	1.538E-08	0.0000	2.036E-07	0.0000
Total	6.433E+00	0.9290	2.215E-04	0.0000	0.000E+00	0.0000	1.016E-01	0.0147	2.842E-01	0.0410	1.035E-01	0.0150	2.202E-03	0.0003

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.815E+00	0.4065
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.444E-01	0.0353
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E+00	0.5399
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.598E-02	0.0139
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.961E-02	0.0043
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.812E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.925E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 2.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	2.416E+00	0.3787	1.002E-04	0.0000	0.000E+00	0.0000	1.428E-02	0.0022	2.119E-02	0.0033	2.971E-03	0.0005	1.685E-04	0.0000
Cs-134	1.628E-01	0.0255	2.317E-06	0.0000	0.000E+00	0.0000	2.113E-03	0.0003	6.296E-03	0.0010	2.470E-03	0.0004	5.024E-05	0.0000
Cs-137	3.216E+00	0.5040	8.709E-05	0.0000	0.000E+00	0.0000	7.953E-02	0.0125	2.427E-01	0.0380	9.349E-02	0.0147	1.869E-03	0.0003
Eu-152	9.041E-02	0.0142	8.516E-06	0.0000	0.000E+00	0.0000	9.220E-06	0.0000	1.642E-05	0.0000	2.585E-07	0.0000	3.419E-06	0.0000
Eu-154	2.715E-02	0.0043	3.036E-06	0.0000	0.000E+00	0.0000	3.740E-06	0.0000	6.655E-06	0.0000	1.049E-07	0.0000	1.388E-06	0.0000
Eu-155	5.871E-04	0.0001	3.457E-07	0.0000	0.000E+00	0.0000	4.702E-07	0.0000	8.355E-07	0.0000	1.322E-08	0.0000	1.750E-07	0.0000
Total	5.913E+00	0.9268	2.015E-04	0.0000	0.000E+00	0.0000	9.593E-02	0.0150	2.702E-01	0.0423	9.894E-02	0.0155	2.093E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 2.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.455E+00	0.3848
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.737E-01	0.0272
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.634E+00	0.5695
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.044E-02	0.0142
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.716E-02	0.0043
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.889E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.381E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	2.107E+00	0.3568	8.697E-05	0.0000	0.000E+00	0.0000	1.239E-02	0.0021	1.839E-02	0.0031	2.579E-03	0.0004	1.463E-04	0.0000
Cs-134	1.158E-01	0.0196	1.639E-06	0.0000	0.000E+00	0.0000	1.495E-03	0.0003	4.554E-03	0.0008	1.748E-03	0.0003	3.554E-05	0.0000
Cs-137	3.127E+00	0.5295	8.426E-05	0.0000	0.000E+00	0.0000	7.695E-02	0.0130	2.348E-01	0.0398	9.046E-02	0.0153	1.809E-03	0.0003
Eu-152	8.519E-02	0.0144	7.986E-06	0.0000	0.000E+00	0.0000	8.647E-06	0.0000	1.540E-05	0.0000	2.424E-07	0.0000	3.207E-06	0.0000
Eu-154	2.490E-02	0.0042	2.772E-06	0.0000	0.000E+00	0.0000	3.415E-06	0.0000	6.077E-06	0.0000	9.580E-08	0.0000	1.268E-06	0.0000
Eu-155	5.076E-04	0.0001	2.970E-07	0.0000	0.000E+00	0.0000	4.040E-07	0.0000	7.178E-07	0.0000	1.135E-08	0.0000	1.503E-07	0.0000
Total	5.461E+00	0.9246	1.839E-04	0.0000	0.000E+00	0.0000	9.085E-02	0.0154	2.577E-01	0.0436	9.479E-02	0.0160	1.995E-03	0.0003

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.141E+00	0.3625
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.235E-01	0.0209
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.531E+00	0.5979
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.522E-02	0.0144
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.492E-02	0.0042
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.092E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.906E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	1.838E+00	0.3347	7.550E-05	0.0000	0.000E+00	0.0000	1.076E-02	0.0020	1.597E-02	0.0029	2.239E-03	0.0004	1.270E-04	0.0000
Cs-134	8.230E-02	0.0150	1.160E-06	0.0000	0.000E+00	0.0000	1.058E-03	0.0002	3.151E-03	0.0006	1.236E-03	0.0002	2.514E-05	0.0000
Cs-137	3.041E+00	0.5539	8.152E-05	0.0000	0.000E+00	0.0000	7.445E-02	0.0136	2.272E-01	0.0414	8.752E-02	0.0159	1.750E-03	0.0003
Eu-152	8.027E-02	0.0146	7.489E-06	0.0000	0.000E+00	0.0000	8.109E-06	0.0000	1.444E-05	0.0000	2.273E-07	0.0000	3.007E-06	0.0000
Eu-154	2.284E-02	0.0042	2.531E-06	0.0000	0.000E+00	0.0000	3.118E-06	0.0000	5.548E-06	0.0000	8.747E-08	0.0000	1.157E-06	0.0000
Eu-155	4.388E-04	0.0001	2.551E-07	0.0000	0.000E+00	0.0000	3.470E-07	0.0000	6.166E-07	0.0000	9.752E-09	0.0000	1.291E-07	0.0000
Total	5.064E+00	0.9225	1.685E-04	0.0000	0.000E+00	0.0000	8.628E-02	0.0157	2.463E-01	0.0449	9.100E-02	0.0166	1.906E-03	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.867E+00	0.3400
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.777E-02	0.0160
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.432E+00	0.6251
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.030E-02	0.0146
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.286E-02	0.0042
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.402E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.490E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	1.602E+00	0.3129	6.554E-05	0.0000	0.000E+00	0.0000	9.340E-03	0.0018	1.386E-02	0.0027	1.944E-03	0.0004	1.102E-04	0.0000
Cs-134	5.851E-02	0.0114	8.204E-07	0.0000	0.000E+00	0.0000	7.483E-04	0.0001	2.229E-03	0.0004	8.746E-04	0.0002	1.779E-05	0.0000
Cs-137	2.957E+00	0.5772	7.887E-05	0.0000	0.000E+00	0.0000	7.203E-02	0.0141	2.198E-01	0.0429	8.467E-02	0.0165	1.693E-03	0.0003
Eu-152	7.563E-02	0.0148	7.023E-06	0.0000	0.000E+00	0.0000	7.604E-06	0.0000	1.354E-05	0.0000	2.132E-07	0.0000	2.820E-06	0.0000
Eu-154	2.096E-02	0.0041	2.311E-06	0.0000	0.000E+00	0.0000	2.846E-06	0.0000	5.065E-06	0.0000	7.986E-08	0.0000	1.057E-06	0.0000
Eu-155	3.794E-04	0.0001	2.191E-07	0.0000	0.000E+00	0.0000	2.981E-07	0.0000	5.296E-07	0.0000	8.377E-09	0.0000	1.109E-07	0.0000
Total	4.714E+00	0.9204	1.548E-04	0.0000	0.000E+00	0.0000	8.212E-02	0.0160	2.359E-01	0.0461	8.749E-02	0.0171	1.825E-03	0.0004

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.628E+00	0.3178
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.238E-02	0.0122
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.335E+00	0.6511
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.566E-02	0.0148
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-02	0.0041
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.806E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.122E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 6.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	1.397E+00	0.2914	5.689E-05	0.0000	0.000E+00	0.0000	8.107E-03	0.0017	1.203E-02	0.0025	1.687E-03	0.0004	9.570E-05	0.0000
Cs-134	4.159E-02	0.0087	5.804E-07	0.0000	0.000E+00	0.0000	5.293E-04	0.0001	1.577E-03	0.0003	6.187E-04	0.0001	1.258E-05	0.0000
Cs-137	2.875E+00	0.5995	7.630E-05	0.0000	0.000E+00	0.0000	6.968E-02	0.0145	2.126E-01	0.0443	8.191E-02	0.0171	1.638E-03	0.0003
Eu-152	7.126E-02	0.0149	6.586E-06	0.0000	0.000E+00	0.0000	7.130E-06	0.0000	1.270E-05	0.0000	1.999E-07	0.0000	2.644E-06	0.0000
Eu-154	1.922E-02	0.0040	2.109E-06	0.0000	0.000E+00	0.0000	2.598E-06	0.0000	4.624E-06	0.0000	7.291E-08	0.0000	9.646E-07	0.0000
Eu-155	3.280E-04	0.0001	1.882E-07	0.0000	0.000E+00	0.0000	2.560E-07	0.0000	4.549E-07	0.0000	7.195E-09	0.0000	9.525E-08	0.0000
Total	4.404E+00	0.9185	1.427E-04	0.0000	0.000E+00	0.0000	7.832E-02	0.0163	2.263E-01	0.0472	8.422E-02	0.0176	1.750E-03	0.0004

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 6.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E+00	0.2960
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.433E-02	0.0092
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.241E+00	0.6758
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.129E-02	0.0149
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.923E-02	0.0040
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.290E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.795E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
Co-60	1.218E+00	0.2706	4.938E-05	0.0000	0.000E+00	0.0000	7.037E-03	0.0016	1.044E-02	0.0023	1.464E-03	0.0003	8.306E-05	0.0000
Cs-134	2.957E-02	0.0066	4.105E-07	0.0000	0.000E+00	0.0000	3.744E-04	0.0001	1.115E-03	0.0002	4.376E-04	0.0001	8.900E-06	0.0000
Cs-137	2.795E+00	0.6207	7.381E-05	0.0000	0.000E+00	0.0000	6.740E-02	0.0150	2.057E-01	0.0457	7.924E-02	0.0176	1.584E-03	0.0004
Eu-152	6.713E-02	0.0149	6.175E-06	0.0000	0.000E+00	0.0000	6.686E-06	0.0000	1.191E-05	0.0000	1.874E-07	0.0000	2.480E-06	0.0000
Eu-154	1.763E-02	0.0039	1.926E-06	0.0000	0.000E+00	0.0000	2.372E-06	0.0000	4.221E-06	0.0000	6.655E-08	0.0000	8.806E-07	0.0000
Eu-155	2.836E-04	0.0001	1.616E-07	0.0000	0.000E+00	0.0000	2.199E-07	0.0000	3.907E-07	0.0000	6.180E-09	0.0000	8.181E-08	0.0000
Total	4.128E+00	0.9167	1.319E-04	0.0000	0.000E+00	0.0000	7.482E-02	0.0166	2.173E-01	0.0482	8.114E-02	0.0180	1.680E-03	0.0004

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.237E+00	0.2748
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.151E-02	0.0070
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.149E+00	0.6993
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.716E-02	0.0149
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-02	0.0039
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.845E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.503E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 8.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	1.062E+00	0.2505	4.286E-05	0.0000	0.000E+00	0.0000	6.108E-03	0.0014	9.064E-03	0.0021	1.271E-03	0.0003	7.210E-05	0.0000
Cs-134	2.102E-02	0.0050	2.904E-07	0.0000	0.000E+00	0.0000	2.648E-04	0.0001	7.890E-04	0.0002	3.095E-04	0.0001	6.295E-06	0.0000
Cs-137	2.717E+00	0.6408	7.140E-05	0.0000	0.000E+00	0.0000	6.520E-02	0.0154	1.990E-01	0.0469	7.665E-02	0.0181	1.533E-03	0.0004
Eu-152	6.325E-02	0.0149	5.790E-06	0.0000	0.000E+00	0.0000	6.269E-06	0.0000	1.116E-05	0.0000	1.758E-07	0.0000	2.325E-06	0.0000
Eu-154	1.617E-02	0.0038	1.758E-06	0.0000	0.000E+00	0.0000	2.165E-06	0.0000	3.854E-06	0.0000	6.075E-08	0.0000	8.039E-07	0.0000
Eu-155	2.452E-04	0.0001	1.388E-07	0.0000	0.000E+00	0.0000	1.888E-07	0.0000	3.356E-07	0.0000	5.308E-09	0.0000	7.026E-08	0.0000
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Total	3.880E+00	0.9150	1.222E-04	0.0000	0.000E+00	0.0000	7.158E-02	0.0169	2.088E-01	0.0492	7.823E-02	0.0184	1.614E-03	0.0004

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 8.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.079E+00	0.2544
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.239E-02	0.0053
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.060E+00	0.7215
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.327E-02	0.0149
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.618E-02	0.0038
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.459E-04	0.0001
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Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.241E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 9.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	9.263E-01	0.2313	3.720E-05	0.0000	0.000E+00	0.0000	5.301E-03	0.0013	7.867E-03	0.0020	1.103E-03	0.0003	6.257E-05	0.0000
Cs-134	1.494E-02	0.0037	2.054E-07	0.0000	0.000E+00	0.0000	1.873E-04	0.0000	5.580E-04	0.0001	2.189E-04	0.0001	4.453E-06	0.0000
Cs-137	2.642E+00	0.6598	6.906E-05	0.0000	0.000E+00	0.0000	6.307E-02	0.0157	1.925E-01	0.0481	7.414E-02	0.0185	1.482E-03	0.0004
Eu-152	5.959E-02	0.0149	5.428E-06	0.0000	0.000E+00	0.0000	5.877E-06	0.0000	1.047E-05	0.0000	1.648E-07	0.0000	2.180E-06	0.0000
Eu-154	1.483E-02	0.0037	1.605E-06	0.0000	0.000E+00	0.0000	1.977E-06	0.0000	3.518E-06	0.0000	5.546E-08	0.0000	7.338E-07	0.0000
Eu-155	2.120E-04	0.0001	1.192E-07	0.0000	0.000E+00	0.0000	1.622E-07	0.0000	2.882E-07	0.0000	4.558E-09	0.0000	6.034E-08	0.0000
Total	3.658E+00	0.9134	1.136E-04	0.0000	0.000E+00	0.0000	6.856E-02	0.0171	2.009E-01	0.0502	7.546E-02	0.0188	1.552E-03	0.0004

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 9.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.406E-01	0.2349
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.591E-02	0.0040
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.973E+00	0.7425
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.961E-02	0.0149
Eu-154	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.484E-02	0.0037
Eu-155	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.126E-04	0.0001
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.004E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Parent	Product	Branch	DSR(j,t) (mrem/yr)/(pCi/g)											
(i)	(j)	Fraction	t=	0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	6.000E+00	7.000E+00	8.000E+00	9.000E+00	
#####	#####	#####		#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	
Co-60	Co-60	1.000E+00		5.788E+00	4.698E+00	4.097E+00	3.573E+00	3.115E+00	2.717E+00	2.369E+00	2.065E+00	1.801E+00	1.570E+00	
Cs-134	Cs-134	1.000E+00		3.484E+00	2.476E+00	1.760E+00	1.251E+00	8.892E-01	6.319E-01	4.491E-01	3.192E-01	2.268E-01	1.612E-01	
Cs-137	Cs-137	1.000E+00		1.336E+00	1.299E+00	1.262E+00	1.227E+00	1.192E+00	1.158E+00	1.126E+00	1.094E+00	1.063E+00	1.033E+00	
Eu-152	Eu-152	7.208E-01		1.698E+00	1.600E+00	1.507E+00	1.420E+00	1.338E+00	1.261E+00	1.188E+00	1.119E+00	1.055E+00	9.935E-01	
Eu-152	Eu-152	2.792E-01		6.575E-01	6.196E-01	5.839E-01	5.502E-01	5.184E-01	4.884E-01	4.602E-01	4.336E-01	4.085E-01	3.848E-01	
Eu-152	Gd-152	2.792E-01		0.000E+00	4.577E-16	8.814E-16	1.273E-15	1.635E-15	1.969E-15	2.277E-15	2.561E-15	2.821E-15	3.059E-15	
Eu-152	DSR(j)			6.575E-01	6.196E-01	5.839E-01	5.502E-01	5.184E-01	4.884E-01	4.602E-01	4.336E-01	4.085E-01	3.848E-01	
Eu-154	Eu-154	1.000E+00		2.567E+00	2.355E+00	2.161E+00	1.982E+00	1.818E+00	1.668E+00	1.530E+00	1.403E+00	1.287E+00	1.181E+00	
Eu-155	Eu-155	1.000E+00		7.053E-02	6.098E-02	5.272E-02	4.558E-02	3.941E-02	3.407E-02	2.946E-02	2.547E-02	2.202E-02	1.903E-02	
#####	#####	#####		#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	
Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).														
The DSR includes contributions from associated (half-life μ 0.5 yr) daughters.														

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 10 mrem/yr

Nuclide	(i)	t=	0.000E+00	1.000E+00	2.000E+00	3.000E+00	4.000E+00	5.000E+00	6.000E+00	7.000E+00	8.000E+00	9.000E+00
Co-60			1.856E+00	2.128E+00	2.441E+00	2.799E+00	3.210E+00	3.681E+00	4.222E+00	4.842E+00	5.554E+00	6.370E+00
Cs-134			2.870E+00	4.038E+00	5.681E+00	7.993E+00	1.125E+01	1.582E+01	2.227E+01	3.133E+01	4.409E+01	6.204E+01
Cs-137			7.484E+00	7.700E+00	7.923E+00	8.153E+00	8.389E+00	8.633E+00	8.884E+00	9.143E+00	9.409E+00	9.684E+00
Eu-152			4.246E+00	4.506E+00	4.782E+00	5.075E+00	5.386E+00	5.716E+00	6.067E+00	6.440E+00	6.835E+00	7.255E+00
Eu-154			3.895E+00	4.246E+00	4.628E+00	5.045E+00	5.499E+00	5.995E+00	6.536E+00	7.125E+00	7.768E+00	8.469E+00
Eu-155			1.418E+02	1.640E+02	1.897E+02	2.194E+02	2.537E+02	2.935E+02	3.395E+02	3.927E+02	4.542E+02	5.254E+02

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

Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	pCi/g	(years)		(pCi/g)		(pCi/g)
Co-60	5.992E-01	0.000E+00	5.388E+00	1.856E+00	5.388E+00	1.856E+00
Cs-134	9.871E-02	0.000E+00	3.484E+00	2.870E+00	3.484E+00	2.870E+00
Cs-137	2.879E+00	0.000E+00	1.336E+00	7.484E+00	1.336E+00	7.484E+00
Eu-152	4.325E-02	0.000E+00	2.355E+00	4.246E+00	2.355E+00	4.246E+00
Eu-154	1.257E-02	0.000E+00	2.567E+00	3.895E+00	2.567E+00	3.895E+00
Eu-155	1.117E-02	0.000E+00	7.053E-02	1.418E+02	7.053E-02	1.418E+02

ATTACHMENT 3 TO THIS
RESPONSE TO COMMENTS
IS A BINDER WITH CHARACTERIZATION
SURVEY RESULTS FOR THE FSV
LIQUID EFFLUENT PATHWAY

THE ADDITIONAL BINDER INCLUDES:

SUMMARY ASSESSMENT
1994 SCOPING SURVEY REPORT
1995 CHARACTERIZATION SURVEY REPORT
1996 FOLLOW-UP SURVEY REPORT

THE BINDER IS TO BE ADDED TO
THE FSV FINAL SURVEY REPORT
AS BOOK 2A OF VOLUME 6