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TECHNICAL MEMORANDUM

March 6, 2002

Originator: A.H. Thatcher, CHP, Senior HP Scientist

Subject: ***Derivation of Surface Soil DCGLs for KMTC***

Revision: 2

ENDORSEMENT: This document contains the results of research and technical analysis which have been reviewed and approved for publication by the Technical Director, NEXTEP Environmental, Inc.

H. Newman by Jo Johnson 3-6-02
Harry J. Newman, CHP, Technical Director Date

Introduction:

This document provides information regarding the modeling and parameters used in release limits for outdoor areas where the soil survey unit lies on the surface of the ground. As this modeling supports MARSSIM activities, the release limits will be referred to as Derived Concentration Guideline Levels (DCGL). The characterization data for the outdoor areas of the Technical Center indicates that elevated quantities of uranium and thorium contamination exist at several locations. The data also reveals that radium 226 may not be in equilibrium with uranium 238. DCGLs are therefore derived for:

- Thorium-232 and progeny
- The uranium series to uranium 234
- Ra-226 and progeny (includes dose contribution from Th-230)

The use of three DCGLs allows flexibility whereby higher or lower than expected concentrations of radium 226 (in comparison to uranium 238) can be accommodated.

The remaining section of this document provides the area factors for the three DCGLs.

General Method for Calculating DCGLs:

The software code RESRAD[1] was used to provide pathway modeling, incorporating guidance on parameter values contained in NRC Policy and Guidance Directive PG-8-08[2] and the "Method for Surveying and Averaging Concentrations of Thorium in Contaminated Subsurface Soil"[3]. Where specific guidance is not provided, and sufficient justification for appropriate alternate parameter values are presented and justified, conservative modeling parameters are selected such as the default values from RESRAD.

The computer code DandD[4] is acknowledged as the default code for performing calculations to support release criteria for decommissioning activities by the USNRC. However, the DandD code lacks the ability to model complex soil columns for contaminant transport considerations, thus making the RESRAD code the preferred code for the Technical Center analysis.

The following bullets describe key parameters and criteria used for this modeling.

- **ICRP 72[5] Ingestion Dose Coefficients**– The ingestion and inhalation dose conversion factors (DCFs) from ICRP 56+ documents are summarized in ICRP 72 and applied in this analysis. The ICRP 72 DCFs were developed specifically for calculation of dose to members of the public. ICRP 72 retains the gastrointestinal tract model used in ICRP 30, but also utilizes the updated tissue weighting factors presented in ICRP 60, and revised biokinetic information to reflect increased knowledge in the uptake and retention of various elements in the body. ICRP 72 inhalation factors represent the application of an updated lung uptake and retention model.
- **Surface modeling** – Uniform contamination is assumed to exist to a depth of 30 cm (1 foot) over an area of 10,000 m^2. A 10,000 m^2 area is used as this effectively represents an infinite slab for external exposures. The exposure characteristics for the modeling are for a residential scenario.
- **Saturated hydraulic conductivity** – The upper saturated soil column is located within the Garber-Wellington aquifer. This layer is described as orange-brown to red-brown fine-grained sandstone, irregularly bedded with red-brown shale and some chert and mudstone conglomerate[6]. This highly compacted layer is characterized as a sandy clay with a hydraulic conductivity of less than 100 ft/year[7]. In this analysis, a conservative saturated hydraulic conductivity value of 70 m/y[8] is used to account for potentially greater velocities due to fractured flow.

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[1] Yu, C., A.J. Zielen, J.J. Cheng, Y.C. Yuan, L.G. Jones, D.J. LePoire, Y.Y. Wang, C.O. Loureiro, E. Gnanapragasam, E. Faillace, A. Wallo III, W.A. Williams, and H. Peterson, *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD, Version 5.61*, ANL/EAD/LD-2, Argonne National laboratory, Argonne, Illinois, 1993.

[2] USNRC. Scenarios for Assessing Potential Doses Associated with Residual Radioactivity. Policy and Guidance Directive PG-8-08.

[3] USNRC. Method for Surveying and Averaging Concentrations of Thorium in contaminated Subsurface Soil. Prepared by NRC staff in connection with the review of the AAR "Site Remediation Plan for the former Brooks and Perkins, Inc. Site". 1997.

[4] USNRC. DandD computer code to support license termination, version 1.0. Sandia National Laboratory.

[5] ICRP, Age-Dependent Doses to Members of the Public From Intake of Radionuclides: Part 5 Compilation of Ingestion and Inhalation Dose Coefficients, ICRP Publication 72, Oxford, Pergamon Press, 1995.

[6] Decommissioning Plan for Kerr-McGee Technical Center, March 2001.

[7] Personal communication with Roy Widman and Jim Crawford, Kerr-McGee, 12/6/00.

[8] Table E.2, RESRAD manual.

- **Distribution coefficient (Kd)** – A total of four soil layers are included in the analysis. Those layers are the contaminated layer, the upper unsaturated soil layer, the lower unsaturated soil layer, and the saturated soil column. For all layers except the lower unsaturated soil layer, NUREG 5512 default Kd values are used. For the lower unsaturated soil layer, the recommended Kd value for clay from Sheppard and Thibault[9] is used.

  In order to more accurately classify the unsaturated soil layers, a grain size and hydrometer analysis was performed on an upper soil sample representing the top meter of soil and a lower soil sample above the saturated soil column. The results of this analysis are included as Attachment 1. Classifying the soils in a manner similar to Sheppard and Thibault, the upper soil is classified as a clay loam with similar sized fractions of sand, clay and silt. The lower soil of the unsaturated soil column is similarly classified as a silty clay with a silt sized fraction of 58% and a clay sized fraction of 40%. The limited permeability and significant fraction of silt and clay sized particles in the unsaturated soil column provide an indication of the conservative nature of the use of the default Kds for the upper soil column.

DCGLw for Thorium-232 and progeny

Attachment 2 provides the RESRAD output for the modeling results and the specific parameters used. Figure 1 displays the contribution to dose over time as well. The major pathways are external exposure and ingestion of plants. The analysis predicted a peak dose of 4.682 mrem/y/pCi/g, or a 5.3 pCi/g limit to meet a 25 mrem/y standard.

DCGLw for Total Uranium (to Uranium 234)

Attachment 3 provides the RESRAD output for the modeling results and the specific parameters used. The graph below displays the contribution to dose over time as well. Over 50% of the dose is initially delivered via plant ingestion. The analysis predicted a peak dose of 0.1093 mrem/y/pCi/g, or a 228 pCi/g limit to meet a 25 mrem/y standard. The significantly lower contribution from the uranium series to uranium 234 (as compared to natural thorium) is due to the lack of any significant gamma sources for external exposure from these radionuclides.

DCGLw for Ra-226 and Progeny (including Th-230)

Attachment 4 provides the RESRAD output for the modeling results and the specific parameters used. The graph below displays the contribution to dose over time as well. The overwhelming contribution to dose is from radium 226 via external exposure and plant ingestion. Lead 210 is also predicted to contribute to exposure through the plant pathway. The analysis predicted a peak dose of 7.064 mrem/y/pCi/g, or a 3.5 pCi/g limit to meet a 25 mrem/y standard.

[9] Sheppard, M.I. and Thibault, D.H. Default soil solid/liquid partition coefficients, Kds, for four major soil types: a compendium. Health Physics. Vol. 59 (4), pp. 471-482. 1990. This reference is predominately used as the reference for the Kd recommendations from RESRAD.

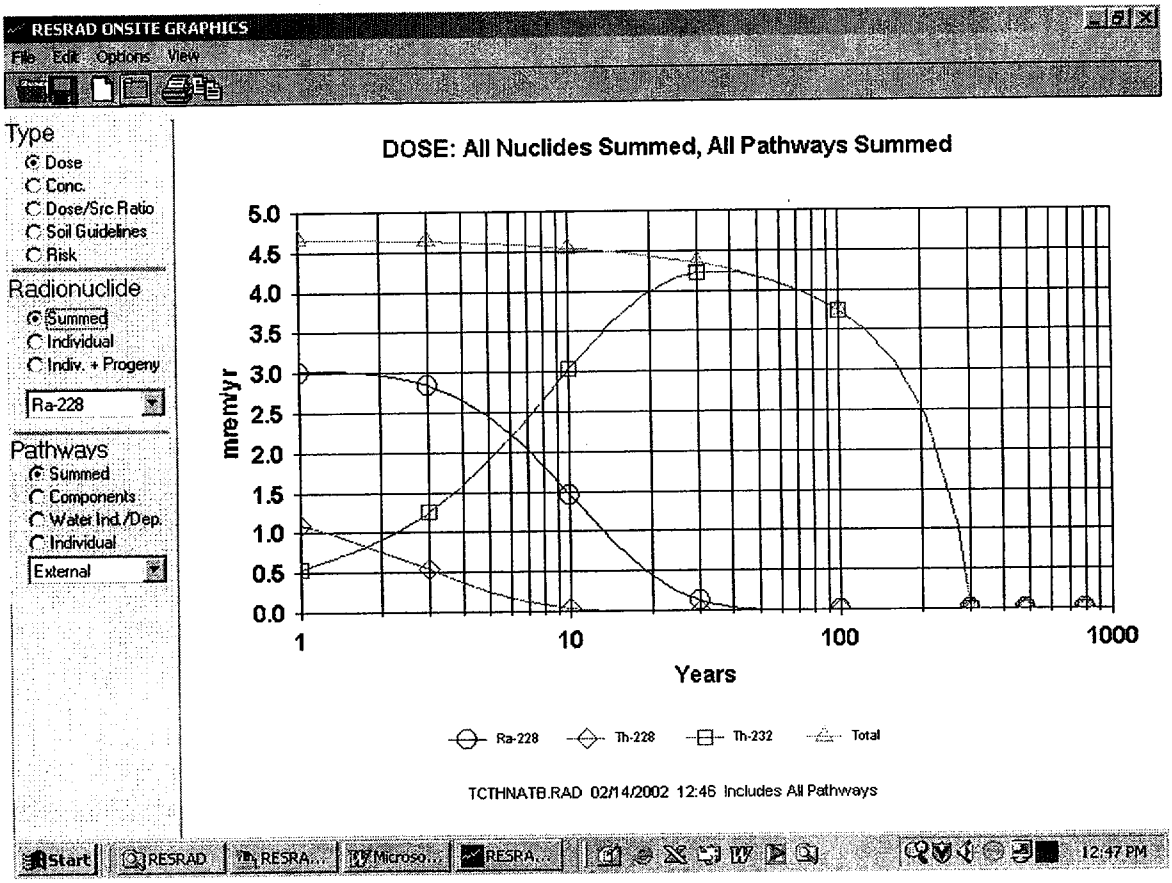


Figure 1
Dose Due to Thorium –232 and Progeny

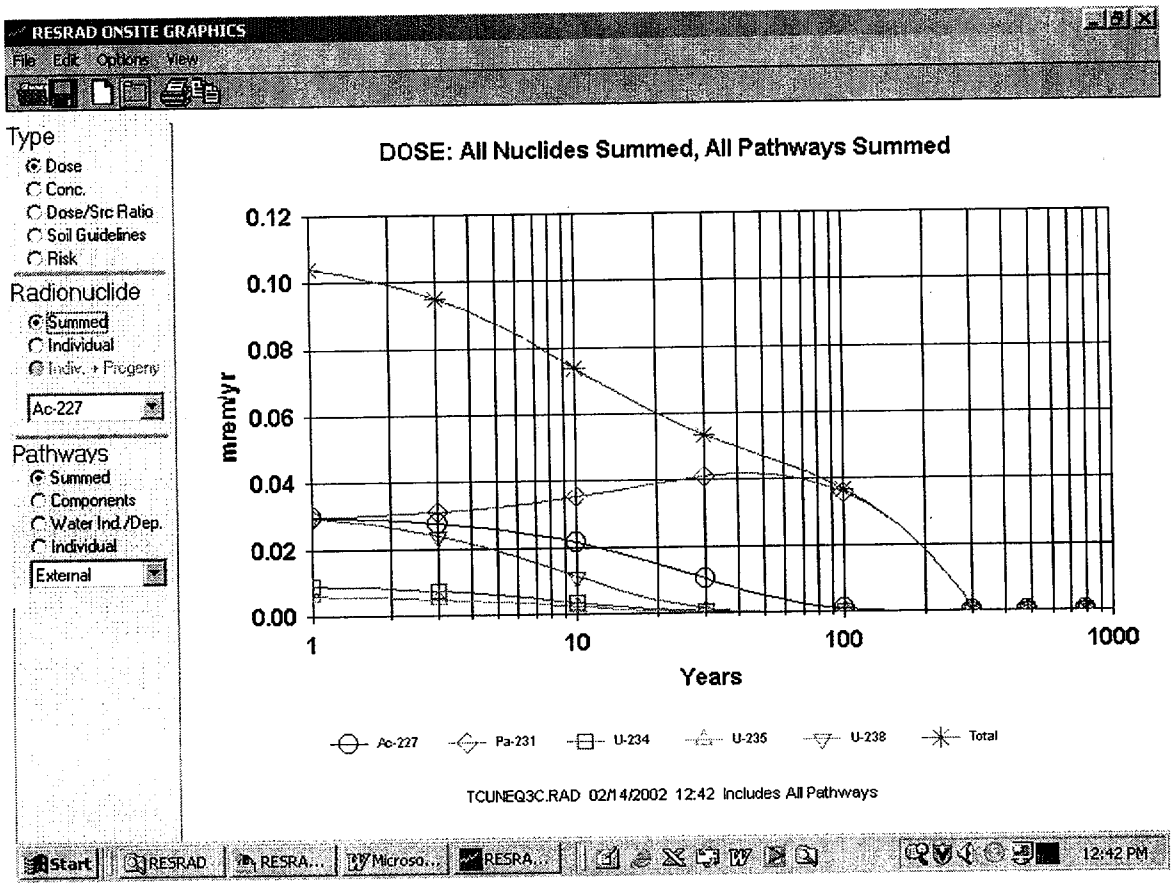


Figure 2
Dose Due to Total Uranium (to U-234)

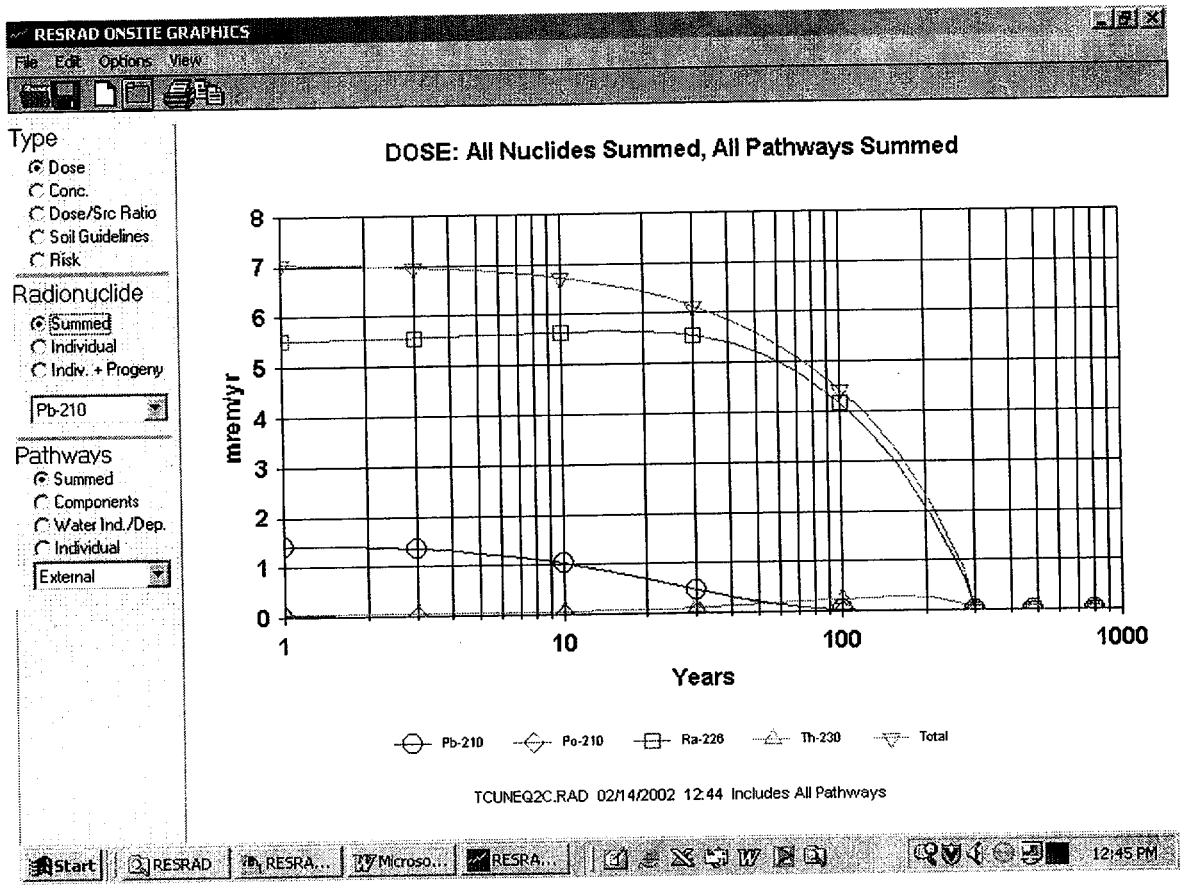


Figure 3
Dose Due to Th-230 and Progeny

Area Factor Results

Successive RESRAD computations were run for each of the three nuclide series described above while varying the contaminated area from 10,000 m^2 down to 1 m^2 to determine the area factors for each nuclide. Figure 4 provides the individual curves for each of the DCGLs detailed in this document. These area factor curves will be used to evaluate elevated measurements significantly greater than the DCGL. In practice, the area factor for an individual release limit may be determined by interpolation from the graph, by developing an equation of the line for each area factor curve, or by performing actual RESRAD computations for the specific surface area.

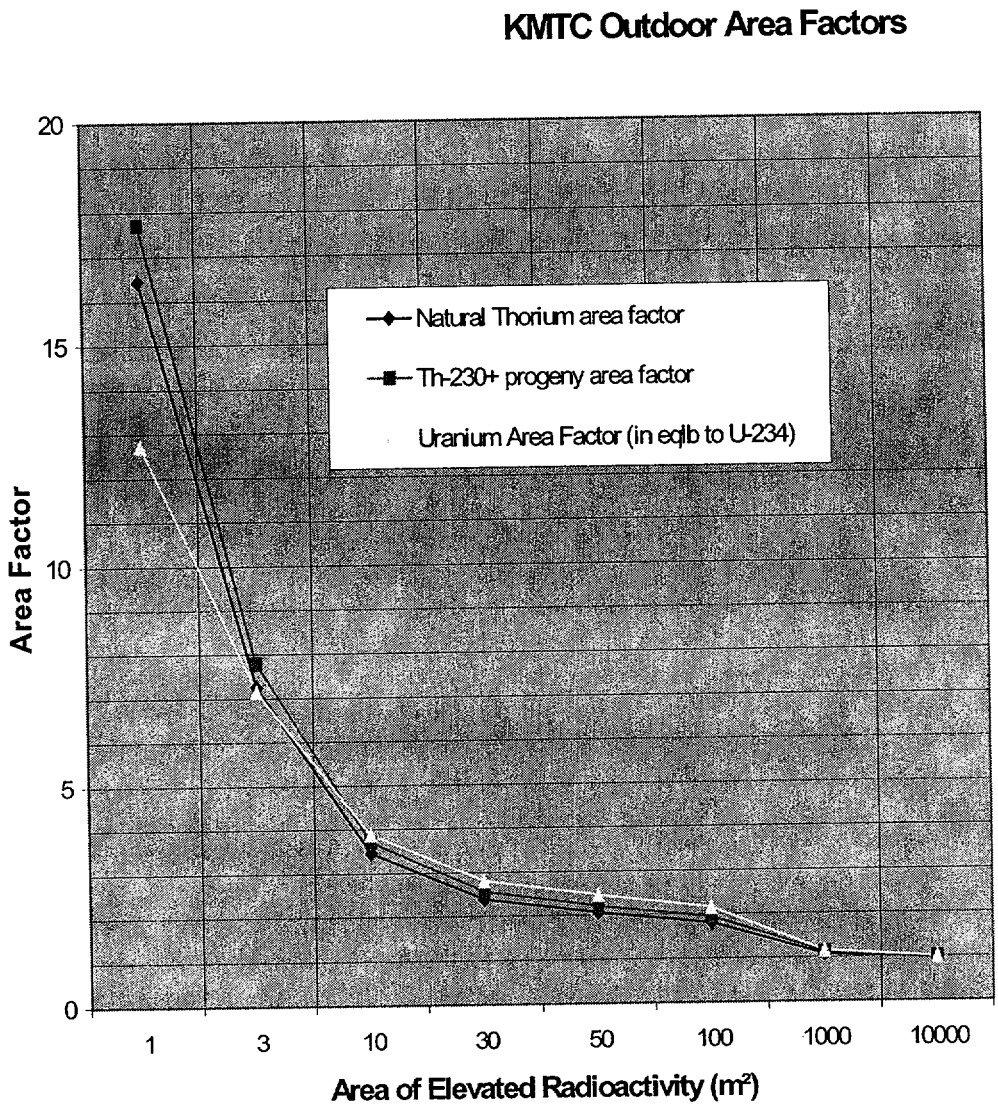
The computed equations for the three curves in Figure 4 are as follows:

Natural Thorium Area Factor = $14.22*(\text{area of elevated activity})^{-0.5287}$

Uranium Series through U-234 Area Factor = $11.76*(\text{area of elevated activity})^{-0.4223}$

Th-230 and progeny Area Factor = $15.27*(\text{area of elevated activity})^{-0.5286}$

Figure 4
Area Factor Calculations



Conclusions/Recommendations

Guidance on application and use of the unity rule for three separate DCGLs is outlined in MARSSIM, appendix I.11. The individual surface DCGLs are summarized in Table 1.

Table 1
Calculated Surface Soil DCGLs for KMTC

Nuclide Series	Dose Conversion Factor (mrem/y/pCi/g)	DCGLw (pCi/g)
Thorium-232 and progeny	4.682	5.3
Total Uranium (to Uranium 234)	0.1093	228
Ra-226 and progeny	7.064	3.5

The assumptions used in calculating the dose are intended to apply to the average member of a critical group or to the maximally exposed member of the general population. The primary pathway for exposure is generally the external pathway and to a lesser extent the ingestion of contaminated foodstuffs.

The use of area factors allows for the evaluation of higher than expected contaminant concentrations in areas significantly smaller than the modeled 10,000 m^2. In practice, the area factor for a specific area may be determined by interpolation from the graph, by using the given equations for the curves, or by performing RESRAD computations.

STANDARD TESTING AND ENGINEERING COMPANY

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5358 S. 125TH EAST AVE., STE B — TULSA, OK 74146 — (918) 459-2700

Acct. No: 0220CIM11 File No: CIM11
Report Date: 12/19/00
Project: Client Information
Location: Tech Center 778.1-110.2
Arch./Engr:
Client: Cimarron Corp.

Date Sampled: 11/20/00
Sampled By: Mike G.
By Order Of: Karen Morgan
Order No:
Quantity Represented: Red Sandy Clayey Silt

REPORT: GRAIN SIZE ANALYSIS OF SOILS
Specification:

LAB NO: E-2487
Test Method: ASTM D422

TEST RESULTS

SIEVE ANALYSIS	
SIEVE SIZE	PERCENT PASSING
No. 4	100.0
No. 10	100.0
No. 40	99.5
No. 200	97.9
HYDROMETER ANALYSIS	
SMALLER THAN	PERCENT
0.074 mm	97.4
0.005 mm	39.9
0.001 mm	21.9

Charge: Cimarron Corp. Attn: Karen Morgan
Orig. Same
1-cc Laboratory

Unit Rates for this Report		
Units	@	Amount
S506 @ 100.00		
S504 @ 45.00		

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Acct. No:	0220CIM11	File No:	CIM11		
Report Date:	12/19/00			Date Sampled:	11/20/00
Project:	Client Information			Sampled By:	Mike G.
Location:	Tech Center 777-112.5			By Order Of:	Karen Morgan
Arch./Engr:				Order No:	
Client:	Cimarron Corp.			Quantity Represented:	Red Clayey Sandy Silt
REPORT:	GRAIN SIZE ANALYSIS OF SOILS			LAB NO:	E-2488
Specification:				Test Method:	ASTM D422

TEST RESULTS

SIEVE ANALYSIS	
SIEVE SIZE	PERCENT PASSING
No. 4	100.0
No. 10	100.0
No. 40	97.7
No. 200	63.9
HYDROMETER ANALYSIS	
SMALLER THAN	PERCENT
0.074 mm	63.3
0.005 mm	21.2
0.001 mm	15.4

Charge: Cimarron Corp. Attn: Karen Morgan
Orig. Same
1-cc Laboratory

Unit Rates for this Report		
Units	@	Amount
S506 @ 100.00		
S504 @ 45.00		

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Attachment 2

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:15 Page 1
Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

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Time = 3.000E+01 13
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RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:15 Page 2
Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

Dose Conversion Factor (and Related) Parameter Summary
File: 92890566.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ra-228+D	9.630E-03	5.080E-03	DCF2(1)
B-1	Th-228+D	1.480E-01	3.450E-01	DCF2(2)
B-1	Th-232	9.260E-02	1.640E+00	DCF2(3)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ra-228+D	2.560E-03	1.440E-03	DCF3(1)
D-1	Th-228+D	2.670E-04	8.080E-04	DCF3(2)
D-1	Th-232	8.520E-04	2.730E-03	DCF3(3)
D-34	Food transfer factors:			
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(1,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(1,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(1,3)
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(2,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)

			tcappc2		
D-34	Th-232	, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Th-232	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(3,2)
D-34	Th-232	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(3,3)
D-5	Bioaccumulation factors, fresh water, L/kg:				
D-5	Ra-228+D	, fish	5.000E+01	5.000E+01	BIOFAC(1,1)
D-5	Ra-228+D	, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(1,2)
D-5	Th-228+D	, fish	1.000E+02	1.000E+02	BIOFAC(2,1)
D-5	Th-228+D	, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(2,2)
D-5	Th-232	, fish	1.000E+02	1.000E+02	BIOFAC(3,1)
D-5	Th-232	, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(3,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	2.000E+01	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	4.810E+02	1.000E+03	---	T(8)
R011	Times for calculations (yr)	7.940E+02	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-228	5.000E-01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Th-228	5.000E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Th-232	5.000E-01	0.000E+00	---	S1(3)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(3)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	7.600E-01	2.000E-01	---	RI

		tcappc2			
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	7.000E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	2	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.630E+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, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R015	Unsat. zone 2, thickness (m)	2.660E+00	0.000E+00	---	H(2)
R015	Unsat. zone 2, soil density (g/cm**3)	1.630E+00	1.500E+00	---	DENSUZ(2)
R015	Unsat. zone 2, total porosity	3.000E-01	4.000E-01	---	TPUZ(2)
R015	Unsat. zone 2, effective porosity	2.000E-01	2.000E-01	---	EPUZ(2)
R015	Unsat. zone 2, field capacity	2.000E-01	2.000E-01	---	FCUZ(2)
R015	Unsat. zone 2, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(2)
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(2)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(1,1)
R016	Unsaturated zone 2 (cm**3/g)	9.100E+03	7.000E+01	---	DCNUCU(1,2)
R016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.189E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU(2,1)
R016	Unsaturated zone 2 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(2,2)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.984E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU(3,1)
R016	Unsaturated zone 2 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(3,2)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.984E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	5.000E+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

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fraction of time spent outdoors (on site)	2.100E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.660E+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)

tcappc2

R018	Soil ingestion rate (g/yr)	1.825E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	7.300E+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	0.500E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.500E+00	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5

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C14	DCF correction factor for gaseous forms of C14	not used	1.234E+02	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

9 -- radon ³ suppressed
Find peak pathway doses ³ active
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RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:15 Page 8
Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

Contaminated Zone Dimensions	
Area:	10000.00 square meters
Thickness:	0.30 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
Ra-228	5.000E-01
Th-228	5.000E-01
Th-232	5.000E-01

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
TDOSE(t):	4.682E+00	4.665E+00	4.633E+00	4.536E+00	4.345E+00	3.745E+00	9.988E-06	0.000E+00	0.000E+00
M(t):	1.873E-01	1.866E-01	1.853E-01	1.814E-01	1.738E-01	1.498E-01	3.995E-07	0.000E+00	0.000E+00

0Maximum TDOSE(t): 4.682E+00 mrem/yr at t = 0.000E+00 years

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:15 Page 9
Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	1.335E+00	0.2852	2.202E-03	0.0005	0.000E+00	0.0000	1.421E+00	0.3035	5.347E-02	0.0114	7.423E-02	0.0159	1.699E-02	0.0036
Th-228	1.573E+00	0.3360	8.561E-03	0.0018	0.000E+00	0.0000	3.309E-03	0.0007	1.844E-04	0.0000	1.452E-05	0.0000	1.553E-03	0.0003
Th-232	7.653E-02	0.0163	6.490E-03	0.0014	0.000E+00	0.0000	9.488E-02	0.0203	3.291E-03	0.0007	4.066E-03	0.0009	6.946E-03	0.0015
Total	2.985E+00	0.6376	1.725E-02	0.0037	0.000E+00	0.0000	1.519E+00	0.3244	5.694E-02	0.0122	7.831E-02	0.0167	2.548E-02	0.0054

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.903E+00	0.6200
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.587E+00	0.3389
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.922E-01	0.0410
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	4.682E+00	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:15 Page 10

Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	1.628E+00	0.3489	4.383E-03	0.0009	0.000E+00	0.0000	1.253E+00	0.2685	4.723E-02	0.0101	6.547E-02	0.0140	1.545E-02	0.0033
Th-228	1.094E+00	0.2346	5.956E-03	0.0013	0.000E+00	0.0000	2.295E-03	0.0005	1.283E-04	0.0000	1.010E-05	0.0000	1.080E-03	0.0002
Th-232	2.571E-01	0.0551	6.895E-03	0.0015	0.000E+00	0.0000	2.538E-01	0.0544	9.157E-03	0.0020	1.231E-02	0.0026	8.897E-03	0.0019
Total	2.979E+00	0.6386	1.723E-02	0.0037	0.000E+00	0.0000	1.509E+00	0.3234	5.651E-02	0.0121	7.779E-02	0.0167	2.543E-02	0.0055

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.013E+00	0.6459
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E+00	0.2366
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.482E-01	0.1175
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	4.665E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	1.763E+00	0.3804	6.101E-03	0.0013	0.000E+00	0.0000	9.725E-01	0.2099	3.677E-02	0.0079	5.092E-02	0.0110	1.255E-02	0.0027
Th-228	5.295E-01	0.1143	2.883E-03	0.0006	0.000E+00	0.0000	1.103E-03	0.0002	6.209E-05	0.0000	4.886E-06	0.0000	5.229E-04	0.0001
Th-232	6.740E-01	0.1455	8.204E-03	0.0018	0.000E+00	0.0000	5.176E-01	0.1117	1.916E-02	0.0041	2.617E-02	0.0056	1.226E-02	0.0026
Total	2.966E+00	0.6402	1.719E-02	0.0037	0.000E+00	0.0000	1.491E+00	0.3219	5.599E-02	0.0121	7.710E-02	0.0166	2.533E-02	0.0055

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.841E+00	0.6133
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.340E-01	0.1153
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.257E+00	0.2714
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	4.633E+00	1.0000

*Sum of all water independent and dependent pathways.

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Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	1.014E+00	0.2236	4.059E-03	0.0009	0.000E+00	0.0000	3.999E-01	0.0882	1.526E-02	0.0034	2.112E-02	0.0047	5.549E-03	0.0012
Th-228	4.170E-02	0.0092	2.274E-04	0.0001	0.000E+00	0.0000	8.500E-05	0.0000	4.893E-06	0.0000	3.852E-07	0.0000	4.125E-05	0.0000
Th-232	1.870E+00	0.4121	1.274E-02	0.0028	0.000E+00	0.0000	1.039E+00	0.2291	3.925E-02	0.0087	5.401E-02	0.0119	1.949E-02	0.0043
Total	2.925E+00	0.6449	1.703E-02	0.0038	0.000E+00	0.0000	1.439E+00	0.3172	5.451E-02	0.0120	7.513E-02	0.0166	2.508E-02	0.0055

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.460E+00	0.3219
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.206E-02	0.0093
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.034E+00	0.6689
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	4.536E+00	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:15 Page 13
Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	9.021E-02	0.0208	3.704E-04	0.0001	0.000E+00	0.0000	3.135E-02	0.0072	1.229E-03	0.0003	1.706E-03	0.0004	4.723E-04	0.0001
Th-228	2.927E-05	0.0000	1.605E-07	0.0000	0.000E+00	0.0000	5.585E-08	0.0000	3.443E-09	0.0000	2.712E-10	0.0000	2.911E-08	0.0000
Th-232	2.772E+00	0.6380	1.640E-02	0.0038	0.000E+00	0.0000	1.288E+00	0.2963	5.013E-02	0.0115	6.929E-02	0.0159	2.425E-02	0.0056
Total	2.862E+00	0.6587	1.677E-02	0.0039	0.000E+00	0.0000	1.319E+00	0.3036	5.136E-02	0.0118	7.100E-02	0.0163	2.472E-02	0.0057

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

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

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Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.253E-01	0.0288
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.951E-05	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.220E+00	0.9711
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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	4.345E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	1.504E-05	0.0000	6.417E-08	0.0000	0.000E+00	0.0000	4.018E-06	0.0000	1.788E-07	0.0000	2.517E-07	0.0000	8.177E-08	0.0000
Th-228	2.619E-16	0.0000	1.499E-18	0.0000	0.000E+00	0.0000	3.866E-19	0.0000	3.182E-20	0.0000	2.511E-21	0.0000	2.718E-19	0.0000
Th-232	2.662E+00	0.7109	1.619E-02	0.0043	0.000E+00	0.0000	9.425E-01	0.2516	4.178E-02	0.0112	5.848E-02	0.0156	2.386E-02	0.0064
Total	2.663E+00	0.7109	1.619E-02	0.0043	0.000E+00	0.0000	9.425E-01	0.2516	4.178E-02	0.0112	5.848E-02	0.0156	2.386E-02	0.0064

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.963E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E-16	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.745E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.745E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.593E-22	0.0000	1.722E-22	0.0000	6.632E-23	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.357E-06	0.7365	1.904E-06	0.1906	7.283E-07	0.0729	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.357E-06	0.7365	1.904E-06	0.1906	7.283E-07	0.0729	0.000E+00	0.0000

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

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Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.978E-22	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.988E-06	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.988E-06	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 = 4.810E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.810E+02 years
Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*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 = 7.940E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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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	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.940E+02 years

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
					Water Dependent Pathways									
Radio-	ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ		ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ		ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ		ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ		ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ		ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ		ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
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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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ
Ra-228	Ra-228	1.000E+00	5.219E+00	4.602E+00	3.579E+00	1.485E+00	1.200E-01	1.757E-05	1.787E-21	0.000E+00	0.000E+00
Ra-228	Th-228	1.000E+00	5.877E-01	1.423E+00	2.103E+00	1.435E+00	1.307E-01	2.170E-05	8.762E-24	0.000E+00	0.000E+00
Ra-228	äDSR(j)		5.806E+00	6.026E+00	5.683E+00	2.920E+00	2.507E-01	3.927E-05	1.796E-21	0.000E+00	0.000E+00
Th-228	Th-228	1.000E+00	3.174E+00	2.208E+00	1.068E+00	8.413E-02	5.903E-05	5.283E-16	0.000E+00	0.000E+00	
Th-232	Th-232	1.000E+00	5.147E-02	5.136E-02	5.114E-02	5.038E-02	4.823E-02	4.098E-02	1.459E-07	0.000E+00	0.000E+00
Th-232	Ra-228	1.000E+00	3.083E-01	8.947E-01	1.869E+00	3.826E+00	4.899E+00	4.099E+00	1.976E-05	0.000E+00	0.000E+00
Th-232	Th-228	1.000E+00	2.466E-02	1.504E-01	5.948E-01	2.192E+00	3.493E+00	3.350E+00	7.427E-08	0.000E+00	0.000E+00
Th-232	äDSR(j)		3.844E-01	1.096E+00	2.515E+00	6.068E+00	8.439E+00	7.491E+00	1.998E-05	0.000E+00	0.000E+00
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*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 30 days) daughters.

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

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ
Ra-228	4.306E+00	4.149E+00	4.399E+00	8.562E+00	9.973E+01	6.366E+05	*2.726E+14	*2.726E+14	*2.726E+14
Th-228	7.877E+00	1.132E+01	2.341E+01	2.972E+02	4.235E+05	*8.192E+14	*8.192E+14	*8.192E+14	*8.192E+14
Th-232	6.504E+01	2.280E+01	9.941E+00	4.120E+00	2.962E+00	3.338E+00	*1.096E+05	*1.096E+05	*1.096E+05
íííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

*At specific activity limit

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

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ
Ra-228	5.000E-01	1.157 ñ 0.002	6.029E+00	4.146E+00	5.806E+00	4.306E+00
Th-228	5.000E-01	0.000E+00	3.174E+00	7.877E+00	3.174E+00	7.877E+00
Th-232	5.000E-01	35.06 ñ 0.07	8.472E+00	2.951E+00	3.844E-01	6.504E+01

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RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:15 Page 19
Summary : KMTC 1 pCi/g natural Th in eqlb, 5512 default Kd parameters, Kd for clay layer
File : TCTHNATB.RAD

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ
Ra-228	Ra-228	1.000E+00	2.609E+00	2.301E+00	1.790E+00	7.423E-01	5.998E-02	8.784E-06	8.935E-22	0.000E+00	0.000E+00
Ra-228	Th-232	1.000E+00	1.541E-01	4.473E-01	9.345E-01	1.913E+00	2.449E+00	2.050E+00	9.878E-06	0.000E+00	0.000E+00
Ra-228	äDOSE(j):		2.763E+00	2.749E+00	2.724E+00	2.655E+00	2.509E+00	2.050E+00	9.878E-06	0.000E+00	0.000E+00
Th-228	Ra-228	1.000E+00	2.938E-01	7.117E-01	1.052E+00	7.177E-01	6.536E-02	1.085E-05	4.381E-24	0.000E+00	0.000E+00
Th-228	Th-228	1.000E+00	1.587E+00	1.104E+00	5.340E-01	4.206E-02	2.951E-05	2.641E-16	0.000E+00	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	1.233E-02	7.521E-02	2.974E-01	1.096E+00	1.746E+00	1.675E+00	3.714E-08	0.000E+00	0.000E+00
Th-228	äDOSE(j):		1.893E+00	1.891E+00	1.883E+00	1.856E+00	1.812E+00	1.675E+00	3.714E-08	0.000E+00	0.000E+00
Th-232	Th-232	1.000E+00	2.574E-02	2.568E-02	2.557E-02	2.519E-02	2.411E-02	2.049E-02	7.294E-08	0.000E+00	0.000E+00
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BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ
Ra-228	Ra-228	1.000E+00	5.000E-01	4.418E-01	3.449E-01	1.451E-01	1.221E-02	2.114E-06	3.780E-17	7.095E-27	1.065E-43
Ra-228	Th-232	1.000E+00	0.000E+00	5.668E-02	1.509E-01	3.447E-01	4.699E-01	4.653E-01	4.212E-01	3.848E-01	3.292E-01
Ra-228	äS(j):		5.000E-01	4.985E-01	4.959E-01	4.898E-01	4.821E-01	4.653E-01	4.212E-01	3.848E-01	3.292E-01
Th-228	Ra-228	1.000E+00	0.000E+00	1.424E-01	2.676E-01	1.997E-01	1.849E-02	3.204E-06	5.729E-17	1.075E-26	1.626E-43
Th-228	Th-228	1.000E+00	5.000E-01	3.479E-01	1.684E-01	1.328E-02	9.374E-06	8.752E-17	0.000E+00	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	9.309E-03	6.190E-02	2.783E-01	4.637E-01	4.653E-01	4.212E-01	3.848E-01	3.292E-01
Th-228	äS(j):		5.000E-01	4.995E-01	4.979E-01	4.913E-01	4.822E-01	4.653E-01	4.212E-01	3.848E-01	3.292E-01
Th-232	Th-232	1.000E+00	5.000E-01	4.998E-01	4.993E-01	4.975E-01	4.926E-01	4.757E-01	4.306E-01	3.934E-01	3.366E-01
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BRF(i) is the branch fraction of the parent nuclide.
0RESMAIN5.EXE execution time = 3.33 seconds

Attachment 3

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 1
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

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RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 2
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

Dose Conversion Factor (and Related) Parameter Summary
File: 92890566.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.040E+00	6.720E+00	DCF2(1)
B-1	Pa-231	5.180E-01	1.280E+00	DCF2(2)
B-1	Pb-210+D	4.070E-03	1.380E-02	DCF2(3)
B-1	Po-210	1.220E-02	9.400E-03	DCF2(4)
B-1	Ra-226+D	1.300E-02	8.600E-03	DCF2(5)
B-1	Th-230	5.180E-02	3.260E-01	DCF2(6)
B-1	U-234	1.300E-02	1.320E-01	DCF2(7)
B-1	U-235+D	1.150E-02	1.230E-01	DCF2(8)
B-1	U-238+D	1.070E-02	1.180E-01	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.070E-03	1.480E-02	DCF3(1)
D-1	Pa-231	2.630E-03	1.060E-02	DCF3(2)
D-1	Pb-210+D	2.560E-03	5.370E-03	DCF3(3)
D-1	Po-210	4.440E-03	1.900E-03	DCF3(4)
D-1	Ra-226+D	1.040E-03	1.330E-03	DCF3(5)
D-1	Th-230	7.780E-04	5.480E-04	DCF3(6)
D-1	U-234	1.810E-04	2.830E-04	DCF3(7)

tcappc3

D-1	U-235+D	1.740E-04	2.670E-04	DCF3(8)
D-1	U-238+D	1.670E-04	2.690E-04	DCF3(9)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34	Po-210 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Po-210 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(4,2)
D-34	Po-210 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.400E-04	3.400E-04	RTF(4,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(5,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: 92890566.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)

D-5	Po-210	, fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Po-210	, crustacea and mollusks	2.000E+04	2.000E+04	BIOFAC(4,2)
D-5					
D-5	Ra-226+D	, fish	5.000E+01	5.000E+01	BIOFAC(5,1)
D-5	Ra-226+D	, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(5,2)
D-5					
D-5	Th-230	, fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-230	, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5					
D-5	U-234	, fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5					
D-5	U-235+D	, fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-235+D	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5					
D-5	U-238+D	, fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

tcappc3

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 4
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	2.000E+01	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	4.810E+02	1.000E+03	---	T(8)
R011	Times for calculations (yr)	7.940E+02	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	2.250E-02	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	2.250E-02	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): U-234	4.890E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-235	2.250E-02	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): U-238	4.890E-01	0.000E+00	---	S1(9)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(9)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.000E-01	4.000E-01	---	TPCZ

Menu	Parameter	tcappc3 User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	7.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	7.000E+01	1.000E+02	---	HCSZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	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	2	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.630E+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, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R015	Unsat. zone 2, thickness (m)	2.660E+00	0.000E+00	---	H(2)
R015	Unsat. zone 2, soil density (g/cm**3)	1.630E+00	1.500E+00	---	DENSUZ(2)
R015	Unsat. zone 2, total porosity	3.000E-01	4.000E-01	---	TPUZ(2)
R015	Unsat. zone 2, effective porosity	2.000E-01	2.000E-01	---	EPUZ(2)
R015	Unsat. zone 2, field capacity	2.000E-01	2.000E-01	---	FCUZ(2)
R015	Unsat. zone 2, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(2)
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(2)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	4.200E+02	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	4.200E+02	2.000E+01	---	DCNUCU(1,1)
R016	Unsaturated zone 2 (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCU(1,2)
R016	Saturated zone (cm**3/g)	4.200E+02	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.796E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.100E+02	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+02	5.000E+01	---	DCNUCU(2,1)
R016	Unsaturated zone 2 (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCU(2,2)
R016	Saturated zone (cm**3/g)	5.100E+02	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.127E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCU(7,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(7,2)
R016	Saturated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.053E-01	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCU(8,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(8,2)
R016	Saturated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.053E-01	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCU(9,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(9,2)
R016	Saturated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.053E-01	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU(3,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	1.000E+02	---	DCNUCU(3,2)
R016	Saturated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.904E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Po-210				
R016	Contaminated zone (cm**3/g)	1.500E+02	1.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+02	1.000E+01	---	DCNUCU(4,1)
R016	Unsaturated zone 2 (cm**3/g)	3.000E+03	1.000E+01	---	DCNUCU(4,2)
R016	Saturated zone (cm**3/g)	1.500E+02	1.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.062E-02	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(5,1)

R016	Unsaturated zone 2 (cm**3/g)	9.100E+03	7.000E+01	---	DCNUCU(5,2)
R016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.189E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU(6,1)
R016	Unsaturated zone 2 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(6,2)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.984E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Exposure duration	5.000E+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	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	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)	7.300E+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	0.500E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.500E+00	FMILK

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC

		tcappc3			
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	1.234E+02	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active

```
5 -- milk ingestion       ³       active
6 -- aquatic foods        ³       active
7 -- drinking water       ³       active
8 -- soil ingestion       ³       active
9 -- radon                ³     suppressed
Find peak pathway doses   ³       active
```

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 10
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

Contaminated Zone Dimensions

Area: 10000.00 square meters
Thickness: 0.30 meters
Cover Depth: 0.00 meters

Initial Soil Concentrations, pCi/g

Ac-227	2.250E-02
Pa-231	2.250E-02
U-234	4.890E-01
U-235	2.250E-02
U-238	4.890E-01

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
TDOSE(t):	1.093E-01	1.040E-01	9.491E-02	7.399E-02	5.361E-02	3.664E-02	1.270E-07	0.000E+00	0.000E+00
M(t):	4.372E-03	4.161E-03	3.796E-03	2.959E-03	2.145E-03	1.465E-03	5.079E-09	0.000E+00	0.000E+00

Maximum TDOSE(t): 1.093E-01 mrem/yr at t = 0.000E+00 years

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 11
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	1.671E-02	0.1529	6.220E-03	0.0569	0.000E+00	0.0000	6.634E-03	0.0607	3.157E-05	0.0003	4.913E-05	0.0004	1.248E-03	0.0114
Pa-231	1.883E-03	0.0172	1.705E-03	0.0156	0.000E+00	0.0000	1.753E-02	0.1604	6.779E-03	0.0620	1.092E-05	0.0001	8.394E-04	0.0077
U-234	7.084E-05	0.0006	8.324E-04	0.0076	0.000E+00	0.0000	6.213E-03	0.0568	5.039E-04	0.0046	1.378E-03	0.0126	1.165E-03	0.0107
U-235	6.102E-03	0.0558	3.390E-05	0.0003	0.000E+00	0.0000	2.750E-04	0.0025	2.235E-05	0.0002	6.094E-05	0.0006	5.155E-05	0.0005
U-238	2.372E-02	0.2170	6.851E-04	0.0063	0.000E+00	0.0000	5.733E-03	0.0524	4.649E-04	0.0043	1.271E-03	0.0116	1.075E-03	0.0098
Total	4.849E-02	0.4436	9.476E-03	0.0867	0.000E+00	0.0000	3.639E-02	0.3329	7.802E-03	0.0714	2.770E-03	0.0253	4.379E-03	0.0401

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.090E-02	0.2827
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.875E-02	0.2630

U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.016E-02	0.0930
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.546E-03	0.0599
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.295E-02	0.3014
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	1.093E-01	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 12
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	1.613E-02	0.1550	6.002E-03	0.0577	0.000E+00	0.0000	6.381E-03	0.0613	3.046E-05	0.0003	4.739E-05	0.0005	1.204E-03	0.0116
Pa-231	2.399E-03	0.0231	1.894E-03	0.0182	0.000E+00	0.0000	1.763E-02	0.1695	6.756E-03	0.0649	1.242E-05	0.0001	8.757E-04	0.0084
U-234	6.377E-05	0.0006	7.492E-04	0.0072	0.000E+00	0.0000	5.579E-03	0.0536	4.541E-04	0.0044	1.240E-03	0.0119	1.049E-03	0.0101
U-235	5.493E-03	0.0528	3.055E-05	0.0003	0.000E+00	0.0000	2.473E-04	0.0024	2.027E-05	0.0002	5.485E-05	0.0005	4.642E-05	0.0004
U-238	2.135E-02	0.2052	6.166E-04	0.0059	0.000E+00	0.0000	5.147E-03	0.0495	4.190E-04	0.0040	1.144E-03	0.0110	9.677E-04	0.0093
Total	4.543E-02	0.4367	9.292E-03	0.0893	0.000E+00	0.0000	3.499E-02	0.3363	7.680E-03	0.0738	2.499E-03	0.0240	4.143E-03	0.0398

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.979E-02	0.2864
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.957E-02	0.2842
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.135E-03	0.0878
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.892E-03	0.0566
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.964E-02	0.2849
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.040E-01	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 13
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	1.502E-02	0.1583	5.590E-03	0.0589	0.000E+00	0.0000	5.902E-03	0.0622	2.834E-05	0.0003	4.411E-05	0.0005	1.121E-03	0.0118
Pa-231	3.372E-03	0.0355	2.249E-03	0.0237	0.000E+00	0.0000	1.779E-02	0.1875	6.702E-03	0.0706	1.522E-05	0.0002	9.440E-04	0.0099
U-234	5.170E-05	0.0005	6.070E-04	0.0064	0.000E+00	0.0000	4.489E-03	0.0473	3.676E-04	0.0039	1.004E-03	0.0106	8.498E-04	0.0090
U-235	4.451E-03	0.0469	2.483E-05	0.0003	0.000E+00	0.0000	1.996E-04	0.0021	1.667E-05	0.0002	4.441E-05	0.0005	3.764E-05	0.0004

U-238	1.729E-02	0.1822	4.996E-04	0.0053	0.000E+00	0.0000	4.142E-03	0.0436	3.392E-04	0.0036	9.264E-04	0.0098	7.840E-04	0.0083
Total	4.019E-02	0.4234	8.970E-03	0.0945	0.000E+00	0.0000	3.253E-02	0.3427	7.453E-03	0.0785	2.034E-03	0.0214	3.737E-03	0.0394

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.771E-02	0.2919
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.108E-02	0.3274
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.370E-03	0.0777
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.774E-03	0.0503
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.398E-02	0.2527
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	9.491E-02	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 14
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	1.171E-02	0.1582	4.356E-03	0.0589	0.000E+00	0.0000	4.491E-03	0.0607	2.203E-05	0.0003	3.430E-05	0.0005	8.738E-04	0.0118
Pa-231	6.228E-03	0.0842	3.290E-03	0.0445	0.000E+00	0.0000	1.812E-02	0.2449	6.513E-03	0.0880	2.340E-05	0.0003	1.142E-03	0.0154
U-234	2.504E-05	0.0003	2.907E-04	0.0039	0.000E+00	0.0000	2.099E-03	0.0284	1.756E-04	0.0024	4.796E-04	0.0065	4.069E-04	0.0055
U-235	2.131E-03	0.0288	1.218E-05	0.0002	0.000E+00	0.0000	9.517E-05	0.0013	8.647E-06	0.0001	2.122E-05	0.0003	1.813E-05	0.0002
U-238	8.272E-03	0.1118	2.391E-04	0.0032	0.000E+00	0.0000	1.936E-03	0.0262	1.620E-04	0.0022	4.425E-04	0.0060	3.752E-04	0.0051
Total	2.836E-02	0.3833	8.188E-03	0.1107	0.000E+00	0.0000	2.674E-02	0.3614	6.881E-03	0.0930	1.001E-03	0.0135	2.816E-03	0.0381

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.148E-02	0.2904
Pa-231	0.000E+00	0.0000	0.000E+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-02	0.4773
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.476E-03	0.0470
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.286E-03	0.0309
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-02	0.1544
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	7.399E-02	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 15
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay

File : TCUNEQ3C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	5.740E-03	0.1071	2.136E-03	0.0398	0.000E+00	0.0000	2.050E-03	0.0382	1.073E-05	0.0002	1.673E-05	0.0003	4.285E-04	0.0080
Pa-231	1.099E-02	0.2051	5.005E-03	0.0933	0.000E+00	0.0000	1.768E-02	0.3297	5.997E-03	0.1119	3.673E-05	0.0007	1.457E-03	0.0272
U-234	4.550E-06	0.0001	3.566E-05	0.0007	0.000E+00	0.0000	2.392E-04	0.0045	2.134E-05	0.0004	5.811E-05	0.0011	4.997E-05	0.0009
U-235	2.614E-04	0.0049	2.285E-06	0.0000	0.000E+00	0.0000	1.388E-05	0.0003	2.125E-06	0.0000	2.575E-06	0.0000	2.450E-06	0.0000
U-238	1.005E-03	0.0188	2.912E-05	0.0005	0.000E+00	0.0000	2.195E-04	0.0041	1.959E-05	0.0004	5.360E-05	0.0010	4.570E-05	0.0009
Total	1.801E-02	0.3358	7.207E-03	0.1344	0.000E+00	0.0000	2.020E-02	0.3767	6.051E-03	0.1129	1.677E-04	0.0031	1.983E-03	0.0370

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.038E-02	0.1936
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.117E-02	0.7678
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.088E-04	0.0076
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.848E-04	0.0053
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.373E-03	0.0256
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	5.361E-02	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 10:16 Page 16
Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	4.695E-04	0.0128	1.763E-04	0.0048	0.000E+00	0.0000	1.254E-04	0.0034	8.647E-07	0.0000	1.354E-06	0.0000	3.537E-05	0.0010
Pa-231	1.275E-02	0.3480	5.521E-03	0.1507	0.000E+00	0.0000	1.157E-02	0.3158	4.458E-03	0.1217	4.012E-05	0.0011	1.471E-03	0.0401
U-234	5.490E-06	0.0001	3.120E-07	0.0000	0.000E+00	0.0000	2.386E-06	0.0001	4.432E-07	0.0000	1.644E-07	0.0000	5.637E-07	0.0000
U-235	2.760E-06	0.0001	1.128E-06	0.0000	0.000E+00	0.0000	2.390E-06	0.0001	9.240E-07	0.0000	9.772E-09	0.0000	3.027E-07	0.0000
U-238	6.203E-07	0.0000	1.838E-08	0.0000	0.000E+00	0.0000	1.026E-07	0.0000	1.207E-08	0.0000	3.313E-08	0.0000	2.884E-08	0.0000
Total	1.323E-02	0.3610	5.699E-03	0.1556	0.000E+00	0.0000	1.170E-02	0.3194	4.460E-03	0.1217	4.168E-05	0.0011	1.507E-03	0.0411

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

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

Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.088E-04	0.0221
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.581E-02	0.9774
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.359E-06	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.515E-06	0.0002
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.154E-07	0.0000
ÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.664E-02	1.0000

*Sum of all water independent and dependent pathways.

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Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.848E-13	0.0000	1.428E-14	0.0000	2.745E-15	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.382E-08	0.4239	7.299E-08	0.5748	6.807E-11	0.0005	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.905E-11	0.0003	2.688E-11	0.0002	2.742E-12	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.115E-11	0.0001	1.512E-11	0.0001	1.410E-14	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.036E-15	0.0000	7.106E-16	0.0000	7.261E-17	0.0000	0.000E+00	0.0000
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Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.387E-08	0.4243	7.303E-08	0.5752	7.083E-11	0.0006	0.000E+00	0.0000

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.019E-13	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-07	0.9992
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.867E-11	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.629E-11	0.0002
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.819E-15	0.0000
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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	1.270E-07	1.0000

*Sum of all water independent and dependent pathways.

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Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.810E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
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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	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.810E+02 years
Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
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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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

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Summary : KMTC 1 pCi/g total U in eqlb to U-234, 5512 default Kd parameters, Kd for clay
File : TCUNEQ3C.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.940E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
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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	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.940E+02 years
Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
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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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ
Ac-227	Ac-227	1.000E+00	1.373E+00	1.324E+00	1.231E+00	9.548E-01	4.614E-01	3.595E-02	4.008E-11	0.000E+00	0.000E+00
Pa-231	Pa-231	1.000E+00	1.254E+00	1.248E+00	1.234E+00	1.188E+00	1.062E+00	7.038E-01	4.957E-06	0.000E+00	0.000E+00
Pa-231	Ac-227	1.000E+00	2.342E-02	6.656E-02	1.470E-01	3.820E-01	7.672E-01	8.877E-01	6.815E-07	0.000E+00	0.000E+00
Pa-231	äDSR(j)		1.278E+00	1.314E+00	1.381E+00	1.570E+00	1.830E+00	1.592E+00	5.639E-06	0.000E+00	0.000E+00
U-234	U-234	1.000E+00	2.078E-02	1.868E-02	1.507E-02	7.106E-03	8.284E-04	4.406E-07	2.031E-21	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	1.957E-07	5.429E-07	1.128E-06	2.399E-06	3.284E-06	2.866E-06	1.141E-11	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	3.388E-09	2.332E-08	1.158E-07	8.235E-07	4.029E-06	1.375E-05	5.866E-11	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	5.775E-12	7.311E-11	7.262E-10	1.407E-08	1.733E-07	1.061E-06	2.833E-11	0.000E+00	0.000E+00
U-234	Po-210	1.000E+00	1.292E-12	2.587E-11	3.727E-10	9.622E-09	1.362E-07	1.017E-06	4.203E-11	0.000E+00	0.000E+00
U-234	äDSR(j)		2.078E-02	1.868E-02	1.507E-02	7.109E-03	8.360E-04	1.914E-05	1.404E-10	0.000E+00	0.000E+00
U-235	U-235	1.000E+00	2.909E-01	2.618E-01	2.121E-01	1.014E-01	1.232E-02	7.668E-06	1.954E-21	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	1.211E-05	3.579E-05	7.609E-05	1.615E-04	2.103E-04	1.458E-04	1.027E-09	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	1.677E-07	1.069E-06	5.012E-06	3.214E-05	1.205E-04	1.805E-04	1.412E-10	0.000E+00	0.000E+00
U-235	äDSR(j)		2.909E-01	2.619E-01	2.122E-01	1.016E-01	1.266E-02	3.340E-04	1.168E-09	0.000E+00	0.000E+00
U-238	U-238	1.000E+00	6.737E-02	6.061E-02	4.904E-02	2.337E-02	2.808E-03	1.667E-06	1.876E-21	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	2.895E-08	7.896E-08	1.491E-07	2.113E-07	7.161E-08	1.255E-10	1.728E-24	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	1.888E-13	1.184E-12	5.327E-12	2.937E-11	7.678E-11	7.754E-11	3.089E-16	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	2.343E-15	3.419E-14	3.637E-13	6.810E-12	6.915E-11	3.373E-10	1.554E-15	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	3.391E-18	8.682E-17	1.789E-15	9.165E-14	2.507E-12	2.499E-11	7.479E-16	0.000E+00	0.000E+00
U-238	Po-210	1.000E+00	6.652E-19	2.704E-17	8.320E-16	6.010E-14	1.947E-12	2.394E-11	1.110E-15	0.000E+00	0.000E+00
U-238	äDSR(j)		6.737E-02	6.061E-02	4.904E-02	2.337E-02	2.808E-03	1.667E-06	3.721E-15	0.000E+00	0.000E+00
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*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 30 days) daughters.

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

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ
Ac-227	1.821E+01	1.888E+01	2.030E+01	2.618E+01	5.418E+01	6.954E+02	6.237E+11	*7.230E+13	*7.230E+13
Pa-231	1.956E+01	1.902E+01	1.810E+01	1.593E+01	1.366E+01	1.571E+01	4.434E+06	*4.722E+10	*4.722E+10
U-234	1.203E+03	1.338E+03	1.659E+03	3.517E+03	2.990E+04	1.306E+06	*6.245E+09	*6.245E+09	*6.245E+09
U-235	8.593E+01	9.547E+01	1.178E+02	2.460E+02	1.975E+03	7.485E+04	*2.160E+06	*2.160E+06	*2.160E+06
U-238	3.711E+02	4.124E+02	5.098E+02	1.070E+03	8.904E+03	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05
íííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí	íííííííííí

*At specific activity limit

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

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄ
Ac-227	2.250E-02	0.000E+00	1.373E+00	1.821E+01	1.373E+00	1.821E+01

					tcappc3	
Pa-231	2.250E-02	43.27 ñ 0.09	1.864E+00	1.341E+01	1.278E+00	1.956E+01
U-234	4.890E-01	0.000E+00	2.078E-02	1.203E+03	2.078E-02	1.203E+03
U-235	2.250E-02	0.000E+00	2.909E-01	8.593E+01	2.909E-01	8.593E+01
U-238	4.890E-01	0.000E+00	6.737E-02	3.711E+02	6.737E-02	3.711E+02
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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated
DOSE(j,t), mrem/yr

Nuclide (j)	Parent (i)	BRF(i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ
Ac-227	Ac-227	1.000E+00	3.090E-02	2.979E-02	2.771E-02	2.148E-02	1.038E-02	8.088E-04	9.019E-13	0.000E+00	0.000E+00
Ac-227	Pa-231	1.000E+00	5.269E-04	1.498E-03	3.309E-03	8.595E-03	1.726E-02	1.997E-02	1.533E-08	0.000E+00	0.000E+00
Ac-227	U-235	1.000E+00	3.774E-09	2.404E-08	1.128E-07	7.231E-07	2.710E-06	4.062E-06	3.177E-12	0.000E+00	0.000E+00
Ac-227	äDOSE(j):		3.142E-02	3.129E-02	3.101E-02	3.008E-02	2.765E-02	2.079E-02	1.534E-08	0.000E+00	0.000E+00
Pa-231	Pa-231	1.000E+00	2.822E-02	2.807E-02	2.777E-02	2.672E-02	2.390E-02	1.583E-02	1.115E-07	0.000E+00	0.000E+00
Pa-231	U-235	1.000E+00	2.724E-07	8.053E-07	1.712E-06	3.634E-06	4.732E-06	3.281E-06	2.311E-11	0.000E+00	0.000E+00
Pa-231	äDOSE(j):		2.822E-02	2.807E-02	2.777E-02	2.672E-02	2.391E-02	1.584E-02	1.116E-07	0.000E+00	0.000E+00
U-234	U-234	1.000E+00	1.016E-02	9.134E-03	7.369E-03	3.475E-03	4.051E-04	2.155E-07	9.933E-22	0.000E+00	0.000E+00
U-234	U-238	1.000E+00	1.416E-08	3.861E-08	7.293E-08	1.033E-07	3.502E-08	6.139E-11	8.451E-25	0.000E+00	0.000E+00
U-234	äDOSE(j):		1.016E-02	9.134E-03	7.369E-03	3.475E-03	4.051E-04	2.155E-07	9.942E-22	0.000E+00	0.000E+00
Th-230	U-234	1.000E+00	9.572E-08	2.655E-07	5.516E-07	1.173E-06	1.606E-06	1.402E-06	5.582E-12	0.000E+00	0.000E+00
Th-230	U-238	1.000E+00	9.234E-14	5.788E-13	2.605E-12	1.436E-11	3.754E-11	3.792E-11	1.510E-16	0.000E+00	0.000E+00
Th-230	äDOSE(j):		9.572E-08	2.655E-07	5.516E-07	1.173E-06	1.606E-06	1.402E-06	5.582E-12	0.000E+00	0.000E+00
Ra-226	U-234	1.000E+00	1.657E-09	1.140E-08	5.661E-08	4.027E-07	1.970E-06	6.726E-06	2.868E-11	0.000E+00	0.000E+00
Ra-226	U-238	1.000E+00	1.146E-15	1.672E-14	1.778E-13	3.330E-12	3.381E-11	1.650E-10	7.601E-16	0.000E+00	0.000E+00
Ra-226	äDOSE(j):		1.657E-09	1.140E-08	5.661E-08	4.027E-07	1.970E-06	6.726E-06	2.869E-11	0.000E+00	0.000E+00
Pb-210	U-234	1.000E+00	2.824E-12	3.575E-11	3.551E-10	6.882E-09	8.474E-08	5.187E-07	1.385E-11	0.000E+00	0.000E+00
Pb-210	U-238	1.000E+00	1.658E-18	4.246E-17	8.747E-16	4.482E-14	1.226E-12	1.222E-11	3.657E-16	0.000E+00	0.000E+00
Pb-210	äDOSE(j):		2.824E-12	3.575E-11	3.551E-10	6.882E-09	8.474E-08	5.187E-07	1.385E-11	0.000E+00	0.000E+00
Po-210	U-234	1.000E+00	6.318E-13	1.265E-11	1.822E-10	4.705E-09	6.658E-08	4.975E-07	2.055E-11	0.000E+00	0.000E+00
Po-210	U-238	1.000E+00	3.253E-19	1.322E-17	4.068E-16	2.939E-14	9.522E-13	1.171E-11	5.427E-16	0.000E+00	0.000E+00
Po-210	äDOSE(j):		6.318E-13	1.265E-11	1.822E-10	4.705E-09	6.658E-08	4.975E-07	2.056E-11	0.000E+00	0.000E+00
U-235	U-235	1.000E+00	6.546E-03	5.891E-03	4.772E-03	2.282E-03	2.773E-04	1.725E-07	4.397E-23	0.000E+00	0.000E+00
U-238	U-238	1.000E+00	3.295E-02	2.964E-02	2.398E-02	1.143E-02	1.373E-03	8.151E-07	9.173E-22	0.000E+00	0.000E+00
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BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated
S(j,t), pCi/g

Nuclide (j)	Parent (i)	BRF(i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ
Ac-227	Ac-227	1.000E+00	2.250E-02	2.171E-02	2.022E-02	1.576E-02	7.726E-03	6.379E-04	5.126E-07	8.108E-10	1.162E-14
Ac-227	Pa-231	1.000E+00	0.000E+00	7.026E-04	2.028E-03	5.926E-03	1.249E-02	1.547E-02	8.576E-03	4.851E-03	1.811E-03
Ac-227	U-235	1.000E+00	0.000E+00	7.224E-09	5.917E-08	4.793E-07	1.947E-06	3.145E-06	1.777E-06	1.005E-06	3.752E-07
Ac-227	äS(j):		2.250E-02	2.241E-02	2.225E-02	2.168E-02	2.022E-02	1.611E-02	8.578E-03	4.852E-03	1.812E-03
Pa-231	Pa-231	1.000E+00	2.250E-02	2.243E-02	2.229E-02	2.180E-02	2.047E-02	1.642E-02	8.751E-03	4.950E-03	1.848E-03

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 Pa-231  U-235   1.000E+00    0.000E+00 4.511E-07 1.219E-06 2.890E-06 4.044E-06 3.403E-06 1.813E-06 1.026E-06 3.829E-07
 Pa-231  äS(j):              2.250E-02 2.243E-02 2.229E-02 2.181E-02 2.048E-02 1.643E-02 8.753E-03 4.951E-03 1.848E-03
U-234   U-234   1.000E+00    4.890E-01 4.401E-01 3.566E-01 1.707E-01 2.078E-02 1.310E-05 9.411E-15 4.995E-23 2.446E-37
 U-234   U-238   1.000E+00    0.000E+00 1.248E-06 3.033E-06 4.838E-06 1.768E-06 3.716E-09 8.008E-18 6.816E-26 5.513E-40
 U-234   äS(j):              4.890E-01 4.401E-01 3.566E-01 1.707E-01 2.079E-02 1.311E-05 9.419E-15 5.002E-23 2.452E-37
Th-230  U-234   1.000E+00    0.000E+00 4.177E-06 1.131E-05 2.714E-05 3.960E-05 3.994E-05 3.608E-05 3.292E-05 2.808E-05
 Th-230  U-238   1.000E+00    0.000E+00 5.818E-12 4.560E-11 3.187E-10 9.196E-10 1.080E-09 9.765E-10 8.908E-10 7.600E-10
 Th-230  äS(j):              0.000E+00 4.177E-06 1.131E-05 2.714E-05 3.960E-05 3.994E-05 3.609E-05 3.292E-05 2.808E-05
Ra-226  U-234   1.000E+00    0.000E+00 9.196E-10 7.712E-09 6.811E-08 3.604E-07 1.362E-06 2.987E-06 3.523E-06 3.566E-06
 Ra-226  U-238   1.000E+00    0.000E+00 8.542E-16 2.076E-14 5.410E-13 6.133E-12 3.338E-11 7.914E-11 9.447E-11 9.623E-11
 Ra-226  äS(j):              0.000E+00 9.196E-10 7.712E-09 6.811E-08 3.605E-07 1.362E-06 2.987E-06 3.524E-06 3.566E-06
Pb-210  U-234   1.000E+00    0.000E+00 9.526E-12 2.394E-10 6.969E-09 1.025E-07 8.447E-07 2.383E-06 2.918E-06 3.012E-06
 Pb-210  U-238   1.000E+00    0.000E+00 6.659E-18 4.885E-16 4.309E-14 1.465E-12 1.987E-11 6.293E-11 7.816E-11 8.124E-11
 Pb-210  äS(j):              0.000E+00 9.526E-12 2.394E-10 6.970E-09 1.025E-07 8.447E-07 2.383E-06 2.918E-06 3.012E-06
Po-210  U-234   1.000E+00    0.000E+00 3.159E-12 1.488E-10 6.008E-09 9.800E-08 8.338E-07 2.367E-06 2.901E-06 2.995E-06
 Po-210  U-238   1.000E+00    0.000E+00 1.861E-18 2.720E-16 3.563E-14 1.385E-12 1.959E-11 6.249E-11 7.768E-11 8.078E-11
 Po-210  äS(j):              0.000E+00 3.159E-12 1.488E-10 6.008E-09 9.801E-08 8.338E-07 2.367E-06 2.901E-06 2.995E-06
U-235   U-235   1.000E+00    2.250E-02 2.025E-02 1.641E-02 7.852E-03 9.564E-04 6.031E-07 4.334E-16 2.301E-24 1.128E-38
U-238   U-238   1.000E+00    4.890E-01 4.401E-01 3.566E-01 1.707E-01 2.079E-02 1.311E-05 9.419E-15 5.002E-23 2.452E-37
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 BRF(i) is the branch fraction of the parent nuclide.
RESMAIN5.EXE execution time =    3.13 seconds
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Attachment 4

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 1
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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Time = 3.000E+00 13
Time = 1.000E+01 14
Time = 3.000E+01 15
Time = 1.000E+02 16
Time = 3.000E+02 17
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RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 2
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

Dose Conversion Factor (and Related) Parameter Summary
File: 92890566.LIB

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	2.040E+00	6.720E+00	DCF2(1)
B-1	Pa-231	5.180E-01	1.280E+00	DCF2(2)
B-1	Pb-210+D	4.070E-03	1.380E-02	DCF2(3)
B-1	Po-210	1.220E-02	9.400E-03	DCF2(4)
B-1	Ra-226+D	1.300E-02	8.600E-03	DCF2(5)
B-1	Th-230	5.180E-02	3.260E-01	DCF2(6)
B-1	U-234	1.300E-02	1.320E-01	DCF2(7)
B-1	U-235+D	1.150E-02	1.230E-01	DCF2(8)
B-1	U-238+D	1.070E-02	1.180E-01	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	4.070E-03	1.480E-02	DCF3(1)
D-1	Pa-231	2.630E-03	1.060E-02	DCF3(2)
D-1	Pb-210+D	2.560E-03	5.370E-03	DCF3(3)
D-1	Po-210	4.440E-03	1.900E-03	DCF3(4)
D-1	Ra-226+D	1.040E-03	1.330E-03	DCF3(5)
D-1	Th-230	7.780E-04	5.480E-04	DCF3(6)
D-1	U-234	1.810E-04	2.830E-04	DCF3(7)
D-1	U-235+D	1.740E-04	2.670E-04	DCF3(8)

D-1	U-238+D	1.670E-04	2.690E-04	DCF3(9)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Po-210 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Po-210 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(4,2)
D-34	Po-210 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.400E-04	3.400E-04	RTF(4,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(5,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(5,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(6,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(6,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(6,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: 92890566.LIB

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Po-210 , fish	1.000E+02	1.000E+02	BIOFAC(4,1)

			TCAPPC4		
D-5	Po-210	, crustacea and mollusks	2.000E+04	2.000E+04	BIOFAC(4,2)
D-5					
D-5	Ra-226+D	, fish	5.000E+01	5.000E+01	BIOFAC(5,1)
D-5	Ra-226+D	, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(5,2)
D-5					
D-5	Th-230	, fish	1.000E+02	1.000E+02	BIOFAC(6,1)
D-5	Th-230	, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(6,2)
D-5					
D-5	U-234	, fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-234	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5					
D-5	U-235+D	, fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-235+D	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5					
D-5	U-238+D	, fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	2.000E+01	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	4.810E+02	1.000E+03	---	T(8)
R011	Times for calculations (yr)	7.940E+02	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Po-210	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(6)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Po-210	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(6)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ

R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	7.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.630E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	7.000E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Water table drop rate (m/yr)	0.000E+00	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	2	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.630E+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, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R015	Unsat. zone 2, thickness (m)	2.660E+00	0.000E+00	---	H(2)
R015	Unsat. zone 2, soil density (g/cm**3)	1.630E+00	1.500E+00	---	DENSUZ(2)
R015	Unsat. zone 2, total porosity	3.000E-01	4.000E-01	---	TPUZ(2)
R015	Unsat. zone 2, effective porosity	2.000E-01	2.000E-01	---	EPUZ(2)
R015	Unsat. zone 2, field capacity	2.000E-01	2.000E-01	---	FCUZ(2)
R015	Unsat. zone 2, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(2)
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU(3,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	1.000E+02	---	DCNUCU(3,2)
R016	Saturated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.904E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Po-210				
R016	Contaminated zone (cm**3/g)	1.500E+02	1.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+02	1.000E+01	---	DCNUCU(4,1)

R016	Unsaturated zone 2 (cm**3/g)	3.000E+03	1.000E+01	---	DCNUCU(4,2)
R016	Saturated zone (cm**3/g)	1.500E+02	1.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.062E-02	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(5,1)
R016	Unsaturated zone 2 (cm**3/g)	9.100E+03	7.000E+01	---	DCNUCU(5,2)
R016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.189E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU(6,1)
R016	Unsaturated zone 2 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(6,2)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.984E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	4.200E+02	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	4.200E+02	2.000E+01	---	DCNUCU(1,1)
R016	Unsaturated zone 2 (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCU(1,2)
R016	Saturated zone (cm**3/g)	4.200E+02	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.796E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.100E+02	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+02	5.000E+01	---	DCNUCU(2,1)
R016	Unsaturated zone 2 (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCU(2,2)
R016	Saturated zone (cm**3/g)	5.100E+02	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.127E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCU(7,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(7,2)
R016	Saturated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.053E-01	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for daughter U-235				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCU(8,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(8,2)
R016	Saturated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.053E-01	ALEACH(8)

R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter U-238				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCU(9,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(9,2)
R016	Saturated zone (cm**3/g)	1.500E+01	5.000E+01	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.053E-01	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	1.000E-04	---	MLINH

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Exposure duration	5.000E+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	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	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)	7.300E+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	0.500E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.500E+00	FMILK

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4

		TCAPPC4			
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	1.234E+02	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)

Site-Specific Parameter Summary (continued)

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

Summary of Pathway Selections

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

8 -- soil ingestion ³ active
9 -- radon ³ suppressed
Find peak pathway doses ³ active
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RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 10
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10000.00 square meters	Pb-210	1.000E+00
Thickness:	0.30 meters	Po-210	1.000E+00
Cover Depth:	0.00 meters	Ra-226	1.000E+00
		Th-230	1.000E+00

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

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
TDOSE(t):	7.064E+00	7.041E+00	6.972E+00	6.740E+00	6.137E+00	4.430E+00	4.536E-06	0.000E+00	0.000E+00
M(t):	2.826E-01	2.816E-01	2.789E-01	2.696E-01	2.455E-01	1.772E-01	1.814E-07	0.000E+00	0.000E+00

Maximum TDOSE(t): 7.064E+00 mrem/yr at t = 0.000E+00 years

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 11
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	2.292E-03	0.0003	1.447E-03	0.0002	0.000E+00	0.0000	8.733E-01	0.1236	2.400E-01	0.0340	4.872E-02	0.0069	6.764E-02	0.0096
Po-210	8.890E-06	0.0000	7.693E-04	0.0001	0.000E+00	0.0000	6.005E-02	0.0085	1.673E-01	0.0237	1.790E-02	0.0025	2.815E-02	0.0040
Ra-226	4.142E+00	0.5864	1.809E-03	0.0003	0.000E+00	0.0000	1.239E+00	0.1754	4.935E-02	0.0070	6.477E-02	0.0092	1.533E-02	0.0022
Th-230	1.356E-03	0.0002	7.144E-03	0.0010	0.000E+00	0.0000	2.324E-02	0.0033	1.290E-03	0.0002	1.131E-04	0.0000	1.079E-02	0.0015
Total	4.146E+00	0.5869	1.117E-02	0.0016	0.000E+00	0.0000	2.196E+00	0.3108	4.579E-01	0.0648	1.315E-01	0.0186	1.219E-01	0.0173

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.233E+00	0.1746
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.741E-01	0.0388
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.513E+00	0.7804
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.393E-02	0.0062
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	7.064E+00	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 12
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	2.216E-03	0.0003	2.023E-03	0.0003	0.000E+00	0.0000	8.982E-01	0.1276	3.676E-01	0.0522	6.189E-02	0.0088	8.817E-02	0.0125
Po-210	1.412E-06	0.0000	1.222E-04	0.0000	0.000E+00	0.0000	9.508E-03	0.0014	2.657E-02	0.0038	2.842E-03	0.0004	4.471E-03	0.0006
Ra-226	4.127E+00	0.5862	1.859E-03	0.0003	0.000E+00	0.0000	1.259E+00	0.1788	5.920E-02	0.0084	6.622E-02	0.0094	1.780E-02	0.0025
Th-230	3.146E-03	0.0004	7.141E-03	0.0010	0.000E+00	0.0000	2.369E-02	0.0034	1.312E-03	0.0002	1.410E-04	0.0000	1.079E-02	0.0015
Total	4.132E+00	0.5869	1.115E-02	0.0016	0.000E+00	0.0000	2.190E+00	0.3111	4.546E-01	0.0646	1.311E-01	0.0186	1.212E-01	0.0172

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.420E+00	0.2017
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.351E-02	0.0062
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.531E+00	0.7856
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.622E-02	0.0066
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	7.041E+00	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 13
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	2.059E-03	0.0003	1.990E-03	0.0003	0.000E+00	0.0000	8.373E-01	0.1201	3.654E-01	0.0524	6.002E-02	0.0086	8.598E-02	0.0123
Po-210	3.559E-08	0.0000	3.081E-06	0.0000	0.000E+00	0.0000	2.381E-04	0.0000	6.697E-04	0.0001	7.165E-05	0.0000	1.127E-04	0.0000
Ra-226	4.096E+00	0.5875	1.972E-03	0.0003	0.000E+00	0.0000	1.295E+00	0.1857	8.165E-02	0.0117	6.930E-02	0.0099	2.313E-02	0.0033
Th-230	6.702E-03	0.0010	7.136E-03	0.0010	0.000E+00	0.0000	2.461E-02	0.0035	1.371E-03	0.0002	1.993E-04	0.0000	1.080E-02	0.0015
Total	4.105E+00	0.5888	1.110E-02	0.0016	0.000E+00	0.0000	2.157E+00	0.3094	4.491E-01	0.0644	1.296E-01	0.0186	1.200E-01	0.0172

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

Radio-	Water	Fish	Radon	Plant	Meat	Milk	All Pathways*

Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.353E+00	0.1940
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-03	0.0002
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.567E+00	0.7985
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.082E-02	0.0073
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	6.972E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	1.589E-03	0.0002	1.539E-03	0.0002	0.000E+00	0.0000	6.312E-01	0.0936	2.816E-01	0.0418	4.621E-02	0.0069	6.646E-02	0.0099
Po-210	9.055E-14	0.0000	7.842E-12	0.0000	0.000E+00	0.0000	5.919E-10	0.0000	1.703E-09	0.0000	1.822E-10	0.0000	2.869E-10	0.0000
Ra-226	3.990E+00	0.5920	2.300E-03	0.0003	0.000E+00	0.0000	1.387E+00	0.2058	1.478E-01	0.0219	7.801E-02	0.0116	3.884E-02	0.0058
Th-230	1.890E-02	0.0028	7.117E-03	0.0011	0.000E+00	0.0000	2.797E-02	0.0041	1.715E-03	0.0003	4.196E-04	0.0001	1.086E-02	0.0016
Total	4.011E+00	0.5950	1.096E-02	0.0016	0.000E+00	0.0000	2.047E+00	0.3036	4.312E-01	0.0640	1.246E-01	0.0185	1.162E-01	0.0172

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E+00	0.1526
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.645E+00	0.8374
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.698E-02	0.0099
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	6.740E+00	1.0000

*Sum of all water independent and dependent pathways.

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	7.583E-04	0.0001	7.344E-04	0.0001	0.000E+00	0.0000	2.804E-01	0.0457	1.332E-01	0.0217	2.181E-02	0.0036	3.172E-02	0.0052
Po-210	9.381E-30	0.0000	8.143E-28	0.0000	0.000E+00	0.0000	5.723E-26	0.0000	1.763E-25	0.0000	1.888E-26	0.0000	2.980E-26	0.0000
Ra-226	3.698E+00	0.6026	2.788E-03	0.0005	0.000E+00	0.0000	1.449E+00	0.2362	2.525E-01	0.0411	8.938E-02	0.0146	6.416E-02	0.0105

Th-230	5.170E-02	0.0084	7.067E-03	0.0012	0.000E+00	0.0000	3.774E-02	0.0061	3.466E-03	0.0006	1.125E-03	0.0002	1.121E-02	0.0018
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Total	3.751E+00	0.6111	1.059E-02	0.0017	0.000E+00	0.0000	1.767E+00	0.2880	3.891E-01	0.0634	1.123E-01	0.0183	1.071E-01	0.0174

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.686E-01	0.0764
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.830E-25	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.556E+00	0.9053
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.123E-01	0.0183
ÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ
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	6.137E+00	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 16
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	5.681E-05	0.0000	5.514E-05	0.0000	0.000E+00	0.0000	1.559E-02	0.0035	9.671E-03	0.0022	1.576E-03	0.0004	2.381E-03	0.0005
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	2.778E+00	0.6272	2.643E-03	0.0006	0.000E+00	0.0000	9.683E-01	0.2186	2.696E-01	0.0609	7.580E-02	0.0171	7.050E-02	0.0159
Th-230	1.424E-01	0.0322	6.905E-03	0.0016	0.000E+00	0.0000	5.824E-02	0.0131	1.137E-02	0.0026	3.380E-03	0.0008	1.297E-02	0.0029
ÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ
Total	2.921E+00	0.6593	9.603E-03	0.0022	0.000E+00	0.0000	1.042E+00	0.2353	2.907E-01	0.0656	8.076E-02	0.0182	8.585E-02	0.0194

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-02	0.0066
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.165E+00	0.9403
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.353E-01	0.0531
ÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍ
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	4.430E+00	1.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 17
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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

TCAPPC4
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.113E-11	0.0000	8.412E-11	0.0000	4.523E-12	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.032E-06	0.2275	2.290E-06	0.5048	4.365E-07	0.0962	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.371E-07	0.0523	4.495E-07	0.0991	9.107E-08	0.0201	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-06	0.2798	2.739E-06	0.6039	5.276E-07	0.1163	0.000E+00	0.0000

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

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-10	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.758E-06	0.8285
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.776E-07	0.1714
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	4.536E-06	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 = 4.810E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4.810E+02 years
Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 19
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.940E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 7.940E+02 years
Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

RESRAD, Version 6.0 T« Limit = 30 days 03/06/2002 13:12 Page 20
Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
Pb-210	Pb-210	1.000E+00	8.501E-01	8.169E-01	7.541E-01	5.698E-01	2.551E-01	1.475E-02	3.429E-11	0.000E+00	0.000E+00
Pb-210	Po-210	1.000E+00	3.832E-01	6.032E-01	5.986E-01	4.589E-01	2.135E-01	1.458E-02	7.549E-11	0.000E+00	0.000E+00
Pb-210	äDSR(j)		1.233E+00	1.420E+00	1.353E+00	1.029E+00	4.686E-01	2.933E-02	1.098E-10	0.000E+00	0.000E+00
Po-210	Po-210	1.000E+00	2.741E-01	4.351E-02	1.095E-03	2.772E-09	2.830E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	5.492E+00	5.467E+00	5.418E+00	5.250E+00	4.791E+00	3.416E+00	1.494E-06	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	1.575E-02	4.189E-02	8.981E-02	2.253E-01	4.222E-01	3.805E-01	7.173E-07	0.000E+00	0.000E+00
Ra-226	Po-210	1.000E+00	5.128E-03	2.168E-02	5.930E-02	1.697E-01	3.425E-01	3.684E-01	1.546E-06	0.000E+00	0.000E+00
Ra-226	äDSR(j)		5.513E+00	5.531E+00	5.567E+00	5.645E+00	5.556E+00	4.165E+00	3.758E-06	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	4.276E-02	4.266E-02	4.247E-02	4.178E-02	3.985E-02	3.336E-02	3.851E-08	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	1.170E-03	3.537E-03	8.237E-03	2.425E-02	6.639E-02	1.746E-01	3.211E-07	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	2.473E-06	1.507E-05	7.217E-05	5.547E-04	3.382E-03	1.394E-02	1.327E-07	0.000E+00	0.000E+00
Th-230	Po-210	1.000E+00	6.486E-07	6.245E-06	4.133E-05	3.948E-04	2.684E-03	1.338E-02	2.852E-07	0.000E+00	0.000E+00
Th-230	äDSR(j)		4.393E-02	4.622E-02	5.082E-02	6.698E-02	1.123E-01	2.353E-01	7.776E-07	0.000E+00	0.000E+00

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*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ó 30 days) daughters.

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

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
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Pb-210	2.027E+01	1.760E+01	1.848E+01	2.430E+01	5.335E+01	8.523E+02	2.277E+11	*7.631E+13	*7.631E+13
Po-210	9.119E+01	5.745E+02	2.282E+04	9.020E+09	*4.492E+15	*4.492E+15	*4.492E+15	*4.492E+15	*4.492E+15
Ra-226	4.535E+00	4.520E+00	4.491E+00	4.429E+00	4.500E+00	6.002E+00	6.652E+06	*9.882E+11	*9.882E+11
Th-230	5.690E+02	5.409E+02	4.920E+02	3.732E+02	2.226E+02	1.062E+02	3.215E+07	*2.018E+10	*2.018E+10
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*At specific activity limit

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

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
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Pb-210	1.000E+00	1.193 ñ 0.002	1.422E+00	1.758E+01	1.233E+00	2.027E+01
Po-210	1.000E+00	0.000E+00	2.741E-01	9.119E+01	2.741E-01	9.119E+01
Ra-226	1.000E+00	14.80 ñ 0.03	5.658E+00	4.418E+00	5.513E+00	4.535E+00
Th-230	1.000E+00	161.9 ñ 0.3	2.810E-01	8.898E+01	4.393E-02	5.690E+02
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Summary : Tc 1 pCi/g Th-230 and progeny, 5512 default Kd parameters, Kd for clay layer
File : TCUNEQ2C.RAD

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

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
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Pb-210	Pb-210	1.000E+00	8.501E-01	8.169E-01	7.541E-01	5.698E-01	2.551E-01	1.475E-02	3.429E-11	0.000E+00	0.000E+00
Pb-210	Ra-226	1.000E+00	1.575E-02	4.189E-02	8.981E-02	2.253E-01	4.222E-01	3.805E-01	7.173E-07	0.000E+00	0.000E+00
Pb-210	Th-230	1.000E+00	2.473E-06	1.507E-05	7.217E-05	5.547E-04	3.382E-03	1.394E-02	1.327E-07	0.000E+00	0.000E+00
Pb-210	äDOSE(j):		8.659E-01	8.588E-01	8.440E-01	7.957E-01	6.807E-01	4.092E-01	8.501E-07	0.000E+00	0.000E+00
Po-210	Pb-210	1.000E+00	3.832E-01	6.032E-01	5.986E-01	4.589E-01	2.135E-01	1.458E-02	7.549E-11	0.000E+00	0.000E+00
Po-210	Po-210	1.000E+00	2.741E-01	4.351E-02	1.095E-03	2.772E-09	2.830E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-210	Ra-226	1.000E+00	5.128E-03	2.168E-02	5.930E-02	1.697E-01	3.425E-01	3.684E-01	1.546E-06	0.000E+00	0.000E+00
Po-210	Th-230	1.000E+00	6.486E-07	6.245E-06	4.133E-05	3.948E-04	2.684E-03	1.338E-02	2.852E-07	0.000E+00	0.000E+00
Po-210	äDOSE(j):		6.625E-01	6.684E-01	6.591E-01	6.290E-01	5.587E-01	3.963E-01	1.832E-06	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	5.492E+00	5.467E+00	5.418E+00	5.250E+00	4.791E+00	3.416E+00	1.494E-06	0.000E+00	0.000E+00
Ra-226	Th-230	1.000E+00	1.170E-03	3.537E-03	8.237E-03	2.425E-02	6.639E-02	1.746E-01	3.211E-07	0.000E+00	0.000E+00
Ra-226	äDOSE(j):		5.493E+00	5.471E+00	5.426E+00	5.274E+00	4.858E+00	3.591E+00	1.815E-06	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	4.276E-02	4.266E-02	4.247E-02	4.178E-02	3.985E-02	3.336E-02	3.851E-08	0.000E+00	0.000E+00
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BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

TCAPPC4

S(j,t), pCi/g

Nuclide (j)	Parent (i)	BRF(i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	4.810E+02	7.940E+02
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Pb-210	Pb-210	1.000E+00	1.000E+00	9.637E-01	8.950E-01	6.908E-01	3.297E-01	2.476E-02	1.517E-05	1.877E-08	1.761E-13
Pb-210	Ra-226	1.000E+00	0.000E+00	3.046E-02	8.777E-02	2.549E-01	5.285E-01	6.254E-01	3.142E-01	1.631E-01	5.249E-02
Pb-210	Th-230	1.000E+00	0.000E+00	6.641E-06	5.817E-05	5.890E-04	4.136E-03	2.272E-02	5.806E-02	7.015E-02	7.190E-02
Pb-210	äS(j):		1.000E+00	9.942E-01	9.828E-01	9.463E-01	8.624E-01	6.729E-01	3.723E-01	2.333E-01	1.244E-01
Po-210	Pb-210	1.000E+00	0.000E+00	8.167E-01	9.040E-01	7.009E-01	3.345E-01	2.512E-02	1.539E-05	1.905E-08	1.786E-13
Po-210	Po-210	1.000E+00	1.000E+00	1.588E-01	4.004E-03	1.019E-08	1.058E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-210	Ra-226	1.000E+00	0.000E+00	1.652E-02	7.214E-02	2.421E-01	5.209E-01	6.226E-01	3.130E-01	1.625E-01	5.229E-02
Po-210	Th-230	1.000E+00	0.000E+00	2.714E-06	4.086E-05	5.288E-04	3.990E-03	2.245E-02	5.767E-02	6.972E-02	7.149E-02
Po-210	äS(j):		1.000E+00	9.920E-01	9.802E-01	9.435E-01	8.594E-01	6.702E-01	3.707E-01	2.322E-01	1.238E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.964E-01	9.892E-01	9.644E-01	8.970E-01	6.961E-01	3.373E-01	1.751E-01	5.635E-02
Ra-226	Th-230	1.000E+00	0.000E+00	4.323E-04	1.292E-03	4.244E-03	1.222E-02	3.538E-02	7.252E-02	8.460E-02	8.512E-02
Ra-226	äS(j):		1.000E+00	9.968E-01	9.905E-01	9.687E-01	9.092E-01	7.315E-01	4.098E-01	2.597E-01	1.415E-01
Th-230	Th-230	1.000E+00	1.000E+00	9.995E-01	9.985E-01	9.949E-01	9.849E-01	9.505E-01	8.588E-01	7.834E-01	6.684E-01
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BRF(i) is the branch fraction of the parent nuclide.

RESMAIN5.EXE execution time = 1.18 seconds