

40-8724

CHEMETRON CORPORATION

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September 17, 1996

Mr. Timothy Johnson, Section Leader
Materials Decommissioning Section
Low Level Waste and Decommissioning Projects Branch
Division of Waste Management
Office of Nuclear Materials Safety and Safeguards
US Nuclear Regulatory Commission
11555 Rockville Pike
Washington DC 20555

Subject: Revised RESRAD Analysis for the Bert Avenue Site per NRC Comments
(Telecon with NRC and B. Koh Personnel dated August 16, 1996)

Dear Mr. Johnson:

This letter is in response to NRC comments on the RESRAD analysis submitted June 21, 1996. The comments were given to B. Koh and Associates, Inc. in a telephone conference on August 21, 1996. Based on a review of the previously submitted RESRAD analysis, NRC personnel determined that a change in the RESRAD "Graphics Parameters" had an impact on the calculated dose from the groundwater pathway.

In order to address the NRC concern, the RESRAD analysis was rerun and the graphics points per curve parameter was increased from 32 points to its maximum, 1,024 points. Also, NRC and B. Koh and Associates, Inc. personnel agreed that the addition of a third unsaturated zone to the analysis model would be more appropriate for modeling the assumed well depth of 140 meters.

An explanation of the modifications and results of the dose assessment are presented in the Enclosure.

DA96:063 Chemetron

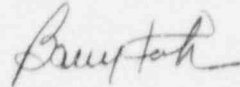
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It is our understanding that this revised RESRAD analysis addresses the last remaining NRC comment on the Bert Avenue Site Remediation Plan. We look forward to a favorable review of this revised analysis and to your issuance of the License Amendment for the Bert Avenue Site.

If you have any questions, please don't hesitate to call me at (410) 356-6612 or Mr. Theodore G. Adams at (716) 592-3431.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Barry Koh".

Barry Koh, PhD
Project Manager

Enclosure

cc: J. Brendel
M. Wetterhahn
E. Ball
T. Adams
M. Seltzer
Mayor Kolar

**Revised RESRAD Analysis
Bert Avenue Site**

1.0 INTRODUCTION

As a result of its review of the revised RESRAD analysis dated June 21, 1996, it was determined that a change in the RESRAD "Graphics Parameters" had an impact on the dose from the groundwater pathway.

In order to address the USNRC concern, the RESRAD computer code was rerun with the graphics points per curve parameter at its maximum. The graphics points per curve parameter determines the smoothness of the calculated RESRAD curves. Also, as a result of discussions with USNRC personnel, it was decided that the addition of a third unsaturated zone would be more appropriate for modeling the assumed well depth of approximately 140 meters.

2.0 SCOPE

This review is limited to evaluation of dose impacts resulting from changes in the graphics points per curve parameter and the addition of a third unsaturated zone.

3.0 METHODOLOGY

The current RESRAD analysis was performed utilizing RESRAD Version 5.61. The modifications to the previous RESRAD analysis (*B. Koh and Associates, Inc., June 21, 1996*) were:

- (1) Changing the graphics points per curve parameter from 32 to the maximum value of 1,024.
- (2) Addition of a third unsaturated zone with an assumed depth of 130 meters and a hydraulic conductivity of 2 m/yr.

Revised RESRAD Analysis Bert Avenue Site

- (3) Reestablish the unsaturated zone 2 depth of 5.2 meters.

4.0 RESULTS

Results of the revised RESRAD analysis, Version 5.61, for the Bert Avenue site are presented in Figure 1. This analysis assumed a third unsaturated zone and utilizes 1,024 points per curve. For comparison, the results of the previous analysis (*B. Koh and Associates, Inc., June 21, 1996*) are presented in Figure 2. The graphical output presented in Figure 2 was plotted using 32 points per curve and assuming 2 unsaturated zones. It is stated in Section 4.6.4.1 (Graphics Parameters) of the RESRAD Users Manual that for most work, 32 or 64 points per curve is an adequate choice. However, as can be seen from the two graphs, a change from 32 points to 1,024 has a significant impact on the calculated dose. The peak dose shown on Figure 1 is primarily from the groundwater pathway. A summary report from the RESRAD analysis is provided as Attachment 1.

As a result of changing the graphic points per curve from 32 to 1,024, as seen by comparing Figures 1 and 2, that the time for the peak dose from the groundwater pathway has shifted from approximately 5,500 years to approximately 3,400 years. The peak dose increased from approximately 4 mrem at 5,500 years to approximately 425 mrem at 3,400 years. The addition of the third unsaturated zone had no significant impact on the dose calculation.

5.0 CONCLUSIONS

The revised analysis resulted in a shifting of the time for the calculated peak dose from the groundwater pathway from approximately 5,500 years to approximately 3,400 years and the corresponding dose increased from approximately 4 mrem to approximately 425 mrem. In the RESRAD code, the magnitude of the dose and time dependence of the annual dose incurred by members of the farm family from the groundwater pathway is controlled by the rate at which

Revised RESRAD Analysis Bert Avenue Site

radionuclides are leached from the contaminated zone and enter the drinking water. However, the assumed distribution coefficient, $10 \text{ cm}^3/\text{g}$, is not consistent with the leachability of uranium from materials similar to those found at the Bert Avenue site (*Remediation Plan, Section 2.0, B. Koh and Associates, Inc., February 1995*). Also, no U-238 in excess of the USEPA's drinking water standards (*EPA, 1991*) has been found in the groundwater at the Bert Avenue Site to date (*Dames & Moore, 1992*). Therefore, the peak dose rate shown on Figure 1 is considered to be the result of limitations (artifacts) in the RESRAD code (*Austin, 1992*). In a recent telephone conversation with USNRC personnel, Mr. Tim Cartin, NRC (August 16, 1996) confirmed that this conclusion may be obtained by use of a more sophisticated (realistic) groundwater model than that provided in the RESRAD code.

It is stated in the USNRC Policy and Guidance Directive PG-8-08, May 1994, that the NRC staff will estimate potential doses for up to 1,000 years after completion of the decommissioning. Ingrowth of decay products of uranium, thorium and other radionuclides with long half-lives will not be considered beyond 1,000 years because of the large uncertainties associated with future conditions.

In conclusion, Chemetron believes that the calculated dose presented in Figure 1 is a result of an artifact in the RESRAD code. The calculated dose of Figure 2 was based on conservative assumptions and shows the maximum dose to be 27 mrem/year which occurs 1 year after the decommissioning is complete.

**Revised RESRAD Analysis
Bert Avenue Site**

6.0 REFERENCES

B. Koh and Associates, February 1995, *Site Remediation Plan, Chemetron Remediation Project, Harvard and Bert Avenue Sites*, Chemetron Corporation, Inc. Newburgh Heights, Ohio.

B. Koh and Associates, June 21, 1996. Letter from B. Koh to T. Johnson, *Chemetron Responses to NRC Comments dated April 22, 1996*, Chemetron Corporation, Inc. Newburgh Heights, Ohio.

Dames and Moore, 1992, *Final Site Characterization Report, Harvard and Bert Avenue Sites, Newburgh Heights, Ohio*, Chemetron Corporation, Inc. Newburgh Heights, Ohio

Environmental Protection Agency. July 18, 1991. *40 CFR Parts 141 and 142 National Primary Drinking Water Regulations; Radionuclides; Proposed Rule*.

J.H Austin, May 5, 1992, *A Preliminary Review of the RESRAD Computer Code, Version 4.1*, U. S. Nuclear Regulatory Commission.

FIGURE 1

DOSE TO THE FARM FAMILY RESIDING ON THE BERT AVENUE CONTAINMENT CELL
(NO COVER)

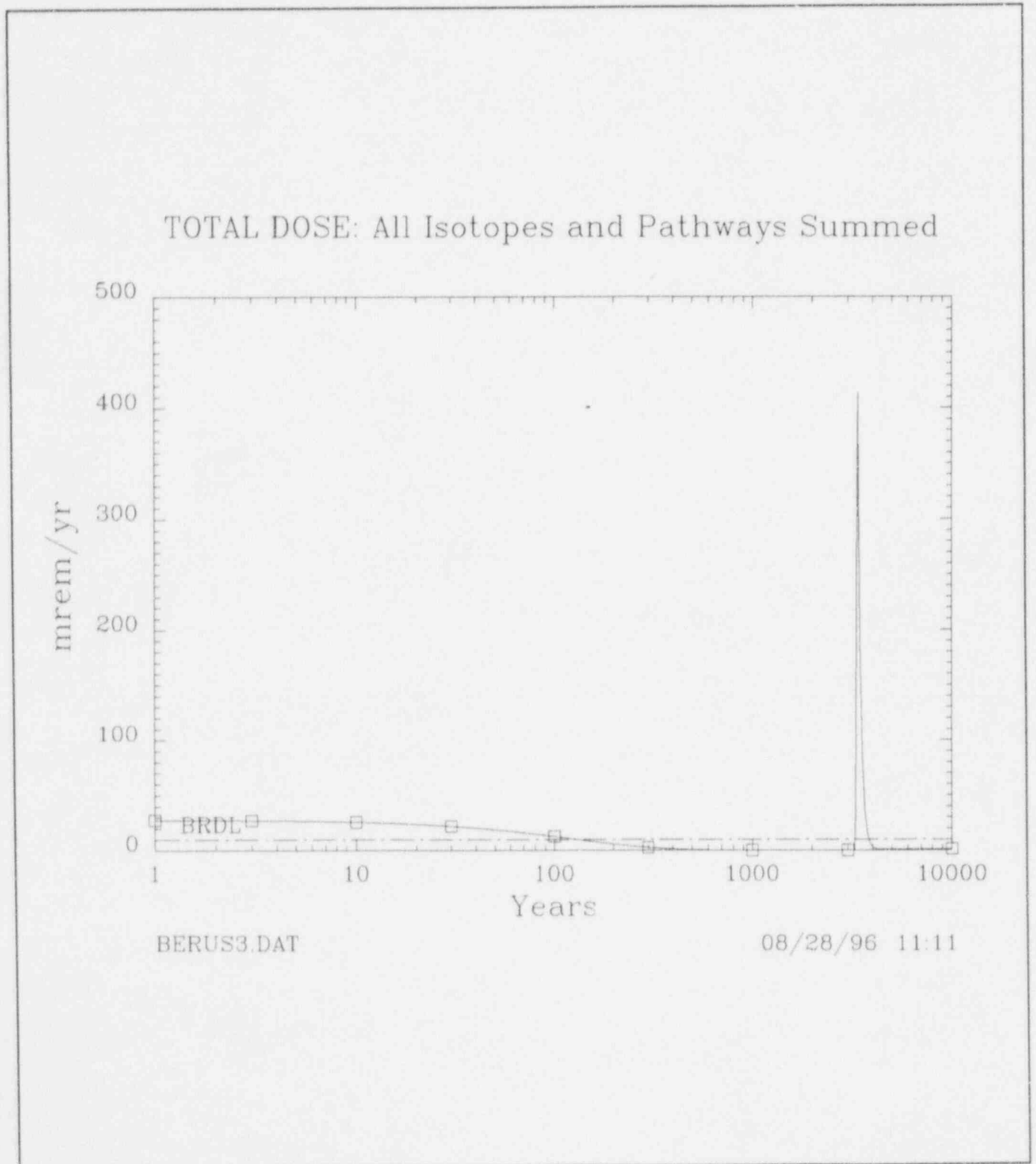
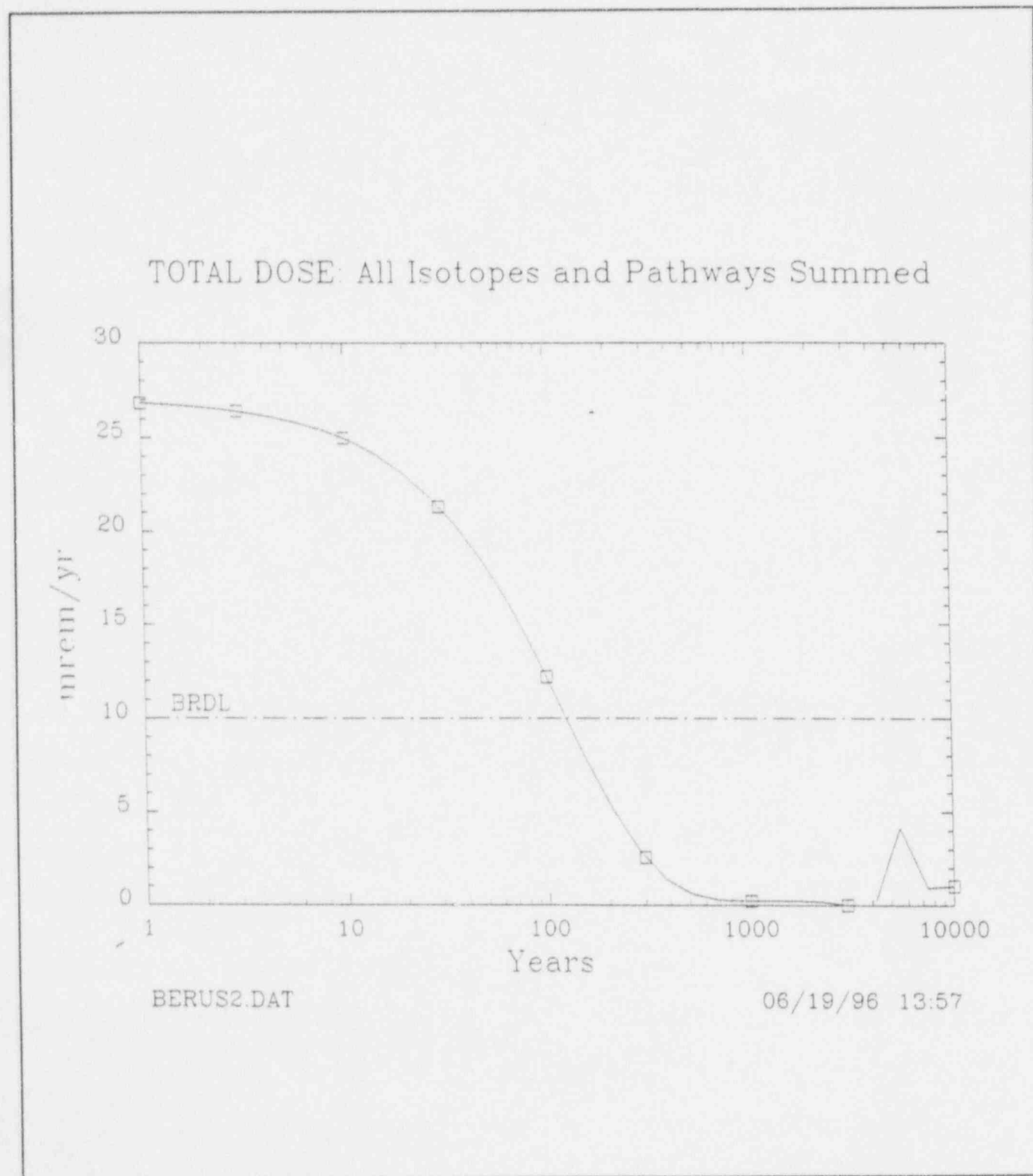


FIGURE 2

DOSE TO THE FARM FAMILY RESIDING ON THE BERT AVENUE CONTAINMENT CELL
(NO COVER - WELL DEPTH 140 METERS)



ATTACHMENT 1

SUMMARY REPORT FOR RESRAD ANALYSIS
Version 5.61

BERT AVENUE SITE

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Table of Contents

AAAAAAAAAAAAAAAAAAAA

Part I: Mixture Sums and Single Radionuclide Guidelines

EE

Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	9
Contaminated Zone and Total Dose Summary	10
Total Dose Components	
Time = 0.000E+00	11
Time = 1.000E+00	12
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
Time = 1.000E+03	18
Time = 3.000E+03	19
Time = 1.000E+04	20
Dose/Source Ratios Summed Over All Pathways	21
Single Radionuclide Soil Guidelines	21
Dose Per Nuclide Summed Over All Pathways	22
Soil Concentration Per Nuclide	23

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Dose Conversion Factor (and Related) Parameter Summary

File: DOSFAC.BIN

Menu *	Parameter	Current	Default	Parameter
		Value	Default	Name

B-1 *	Dose conversion factors for inhalation, mrem/pCi:			
B-1 *	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1 *	Pa-231	1.280E+00	1.280E+00	DCF2(2)
B-1 *	Pb-210+D	2.320E-02	2.320E-02	DCF2(3)
B-1 *	Ra-226+D	8.600E-03	8.600E-03	DCF2(4)
B-1 *	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1 *	U-234	1.320E-01	1.320E-01	DCF2(6)
B-1 *	U-235+D	1.230E-01	1.230E-01	DCF2(7)
B-1 *	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1 *	Dose conversion factors for ingestion, mrem/pCi:			
D-1 *	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1 *	Pa-231	1.060E-02	1.060E-02	DCF3(2)
D-1 *	Pb-210+D	7.270E-03	7.270E-03	DCF3(3)
D-1 *	Ra-226+D	1.330E-03	1.330E-03	DCF3(4)
D-1 *	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1 *	U-234	2.830E-04	2.830E-04	DCF3(6)
D-1 *	U-235+D	2.670E-04	2.670E-04	DCF3(7)
D-1 *	U-238+D	2.690E-04	2.690E-04	DCF3(8)
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 *	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34 *	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34 *	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34 *				
D-34 *	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34 *	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34 *	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34 *				
D-34 *	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34 *	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34 *	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34 *				
D-34 *	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34 *	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34 *	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34 *				

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name

D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)

D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	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	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Site-Specific Parameter Summary

Menu *	Parameter	User	Default	Used by RESRAD	Parameter Name
		Input	(If different from user input)		
R011 *	Area of contaminated zone (m**2)	4.900E+03	1.000E+04	---	AREA
R011 *	Thickness of contaminated zone (m)	2.700E+00	2.000E+00	---	THICK0
R011 *	Length parallel to aquifer flow (m)	9.500E+01	1.000E+02	---	LCZPAQ
R011 *	Basic radiation dose limit (mrem/yr)	1.000E+01	3.000E+01	---	BRDL
R011 *	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011 *	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011 *	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011 *	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011 *	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011 *	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011 *	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011 *	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011 *	Times for calculations (yr)	3.000E+03	0.000E+00	---	T(9)
R011 *	Times for calculations (yr)	1.000E+04	0.000E+00	---	T(10)
R012 *	Initial principal radionuclide (pCi/g): U-234	4.260E+01	0.000E+00	---	S1(6)
R012 *	Initial principal radionuclide (pCi/g): U-235	8.700E-01	0.000E+00	---	S1(7)
R012 *	Initial principal radionuclide (pCi/g): U-238	8.700E+01	0.000E+00	---	S1(8)
R012 *	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012 *	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012 *	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013 *	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013 *	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013 *	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013 *	Density of contaminated zone (g/cm**3)	1.650E+00	1.500E+00	---	DENSCZ
R013 *	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013 *	Contaminated zone total porosity	3.300E-01	4.000E-01	---	TPCZ
R013 *	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013 *	Contaminated zone hydraulic conductivity (m/yr)	2.000E+01	1.000E+01	---	HCCZ
R013 *	Contaminated zone b parameter	4.900E+00	5.300E+00	---	BCZ
R013 *	Humidity in air (g/cm**3)	not used	8.000E+00	---	HUMID
R013 *	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013 *	Precipitation (m/yr)	8.700E-01	1.000E+00	---	PRECIP
R013 *	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013 *	Irrigation mode	overhead	overhead	---	IDITCH
R013 *	Runoff coefficient	4.000E-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)	1.650E+00	1.500E+00	---	DENSAQ
R014 *	Saturated zone total porosity	3.300E-01	4.000E-01	---	TPSZ
R014 *	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014 *	Saturated zone hydraulic conductivity (m/yr)	1.450E+02	1.000E+02	---	HCSZ
R014 *	Saturated zone hydraulic gradient	7.500E-02	2.000E-02	---	HGWT
R014 *	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014 *	Water table drop rate (m/yr)	5.000E-05	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

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Site-Specific Parameter Summary (continued)

Menu *	Parameter	User	Default	Used by RESRAD	Parameter
		Input		(If different from user input)	Name
R015 *	Number of unsaturated zone strata	3	1	---	NS
R015 *	Unsat. zone 1, thickness (m)	2.100E+00	4.000E+00	---	H(1)
R015 *	Unsat. zone 1, soil density (g/cm**3)	1.650E+00	1.500E+00	---	DENSUZ(1)
R015 *	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015 *	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015 *	Unsat. zone 1, soil-specific b parameter	1.140E+01	5.300E+00	---	BUZ(1)
R015 *	Unsat. zone 1, hydraulic conductivity (m/yr)	3.000E-02	1.000E+01	---	HCUZ(1)
R015 *	Unsat. zone 2, thickness (m)	5.200E+00	0.000E+00	---	H(2)
R015 *	Unsat. zone 2, soil density (g/cm**3)	2.100E+00	1.500E+00	---	DENSUZ(2)
R015 *	Unsat. zone 2, total porosity	3.300E-01	4.000E-01	---	TPUZ(2)
R015 *	Unsat. zone 2, effective porosity	2.000E-01	2.000E-01	---	EPUZ(2)
R015 *	Unsat. zone 2, soil-specific b parameter	4.380E+00	5.300E+00	---	BUZ(2)
R015 *	Unsat. zone 2, hydraulic conductivity (m/yr)	3.160E+02	1.000E+01	---	HCUZ(2)
R015 *	Unsat. zone 3, thickness (m)	1.300E+02	0.000E+00	---	H(3)
R015 *	Unsat. zone 3, soil density (g/cm**3)	1.650E+00	1.500E+00	---	DENSUZ(3)
R015 *	Unsat. zone 3, total porosity	4.000E-01	4.000E-01	---	TPUZ(3)
R015 *	Unsat. zone 3, effective porosity	2.000E-01	2.000E-01	---	EPUZ(3)
R015 *	Unsat. zone 3, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(3)
R015 *	Unsat. zone 3, hydraulic conductivity (m/yr)	2.000E+00	1.000E+01	---	HCUZ(3)
R016 *	Distribution coefficients for U-234				
R016 *	Contaminated zone (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCC(6)
R016 *	Unsaturated zone 1 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(6,1)
R016 *	Unsaturated zone 2 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(6,2)
R016 *	Unsaturated zone 3 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(6,3)
R016 *	Saturated zone (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCS(6)
R016 *	Leach rate (/yr)	0.000E+00	0.000E+00	7.987E-03	ALEACH(6)
R016 *	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016 *	Distribution coefficients for U-235				
R016 *	Contaminated zone (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCC(7)
R016 *	Unsaturated zone 1 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(7,1)
R016 *	Unsaturated zone 2 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(7,2)
R016 *	Unsaturated zone 3 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(7,3)
R016 *	Saturated zone (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCS(7)
R016 *	Leach rate (/yr)	0.000E+00	0.000E+00	7.987E-03	ALEACH(7)
R016 *	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016 *	Distribution coefficients for U-238				
R016 *	Contaminated zone (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCC(8)
R016 *	Unsaturated zone 1 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(8,1)
R016 *	Unsaturated zone 2 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(8,2)
R016 *	Unsaturated zone 3 (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCU(8,3)
R016 *	Saturated zone (cm**3/g)	1.000E+01	5.000E+01	---	DCNUCS(8)
R016 *	Leach rate (/yr)	0.000E+00	0.000E+00	7.957E-03	ALEACH(8)
R016 *	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Site-Specific Parameter Summary (continued)

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

R016 *	Distribution coefficients for daughter Ac-227	*	*	*		*
R016 *	Contaminated zone (cm**3/g)	*	2.000E+01	2.000E+01	---	* DCNUCC(1)
R016 *	Unsaturated zone 1 (cm**3/g)	*	2.000E+01	2.000E+01	---	* DCNUCU(1,1)
R016 *	Unsaturated zone 2 (cm**3/g)	*	2.000E+01	2.000E+01	---	* DCNUCU(1,2)
R016 *	Unsaturated zone 3 (cm**3/g)	*	2.000E+01	2.000E+01	---	* DCNUCU(1,3)
R016 *	Saturated zone (cm**3/g)	*	2.000E+01	2.000E+01	---	* DCNUCS(1)
R016 *	Leach rate (/yr)	*	0.000E+00	0.000E+00	4.022E-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)	*	5.000E+01	5.000E+01	---	* DCNUCC(2)
R016 *	Unsaturated zone 1 (cm**3/g)	*	5.000E+01	5.000E+01	---	* DCNUCU(2,1)
R016 *	Unsaturated zone 2 (cm**3/g)	*	5.000E+01	5.000E+01	---	* DCNUCU(2,2)
R016 *	Unsaturated zone 3 (cm**3/g)	*	5.000E+01	5.000E+01	---	* DCNUCU(2,3)
R016 *	Saturated zone (cm**3/g)	*	5.000E+01	5.000E+01	---	* DCNUCS(2)
R016 *	Leach rate (/yr)	*	0.000E+00	0.000E+00	1.616E-03	* ALEACH(2)
R016 *	Solubility constant	*	0.000E+00	0.000E+00	not used	* SOLUBK(2)

R016 *	Distribution coefficients for daughter Pb-210	*	*	*		*
R016 *	Contaminated zone (cm**3/g)	*	1.000E+02	1.000E+02	---	* DCNUCC(3)
R016 *	Unsaturated zone 1 (cm**3/g)	*	1.000E+02	1.000E+02	---	* DCNUCU(3,1)
R016 *	Unsaturated zone 2 (cm**3/g)	*	1.000E+02	1.000E+02	---	* DCNUCU(3,2)
R016 *	Unsaturated zone 3 (cm**3/g)	*	1.000E+02	1.000E+02	---	* DCNUCU(3,3)
R016 *	Saturated zone (cm**3/g)	*	1.000E+02	1.000E+02	---	* DCNUCS(3)
R016 *	Leach rate (/yr)	*	0.000E+00	0.000E+00	8.091E-04	* ALEACH(3)
R016 *	Solubility constant	*	0.000E+00	0.000E+00	not used	* SOLUBK(3)

R016 *	Distribution coefficients for daughter Ra-226	*	*	*		*
R016 *	Contaminated zone (cm**3/g)	*	7.000E+01	7.000E+01	---	* DCNUCC(4)
R016 *	Unsaturated zone 1 (cm**3/g)	*	7.000E+01	7.000E+01	---	* DCNUCU(4,1)
R016 *	Unsaturated zone 2 (cm**3/g)	*	7.000E+01	7.000E+01	---	* DCNUCU(4,2)
R016 *	Unsaturated zone 3 (cm**3/g)	*	7.000E+01	7.000E+01	---	* DCNUCU(4,3)
R016 *	Saturated zone (cm**3/g)	*	7.000E+01	7.000E+01	---	* DCNUCS(4)
R016 *	Leach rate (/yr)	*	0.000E+00	0.000E+00	1.155E-03	* ALEACH(4)
R016 *	Solubility constant	*	0.000E+00	0.000E+00	not used	* SOLUBK(4)

R016 *	Distribution coefficients for daughter Th-230	*	*	*		*
R016 *	Contaminated zone (cm**3/g)	*	6.000E+04	6.000E+04	---	* DCNUCC(5)
R016 *	Unsaturated zone 1 (cm**3/g)	*	6.000E+04	6.000E+04	---	* DCNUCU(5,1)
R016 *	Unsaturated zone 2 (cm**3/g)	*	6.000E+04	6.000E+04	---	* DCNUCU(5,2)
R016 *	Unsaturated zone 3 (cm**3/g)	*	6.000E+04	6.000E+04	---	* DCNUCU(5,3)
R016 *	Saturated zone (cm**3/g)	*	6.000E+04	6.000E+04	---	* DCNUCS(5)
R016 *	Leach rate (/yr)	*	0.000E+00	0.000E+00	1.351E-06	* ALEACH(5)
R016 *	Solubility constant	*	0.000E+00	0.000E+00	not used	* SOLUBK(5)

R017 *	Inhalation rate (m**3/yr)	*	8.400E+03	8.400E+03	---	* INHALR
R017 *	Mass loading for inhalation (g/m**3)	*	2.000E-04	2.000E-04	---	* MLINH
R017 *	Dilution length for airborne dust, inhalation (m)	*	3.000E+00	3.000E+00	---	* LM
R017 *	Exposure duration	*	3.000E+01	3.000E+01	---	* ED
R017 *	Shielding factor, inhalation	*	4.000E-01	4.000E-01	---	* SHF3

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Site-Specific Parameter Summary (continued)

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

R017 *	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017 *	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017 *	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017 *	Shape factor flag, external gamma	1.000E+00	1.000E+00	1 shows circular AREA.	FS
R017 *	Radial 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)	1.600E+02	1.600E+02	---	DIET(1)
R018 *	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018 *	Milk consumption (L/yr)	9.200E+01	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)	3.650E+01	3.650E+01	---	SOIL
R018 *	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018 *	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018 *	Contamination fraction of household water	1.000E+00	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	0.245E+00	FMEAT
R018 *	Contamination fraction of milk	-1	-1	0.245E+00	FMILK

R019 *	Livestock fodder intake for meat (kg/dzy)	6.800E+01	6.800E+01	---	LF15

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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 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	---	PGWDW
R019 *	Household water fraction from ground water	1.000E+00	1.000E+00	---	PGWHH
R019 *	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	PGWLW
R019 *	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	PGWIR
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	---	EVSIN
C14 *	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSIN
C14 *	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14 *	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR *	Storage times of contaminated foodstuffs (days):				
STOR *	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR *	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR *	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR *	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR *	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR *	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR *	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR *	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR *	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021 *	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	FLOOR
R021 *	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	DENSFL
R021 *	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021 *	Total porosity of the building foundation	1.000E-01	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	1.000E-02	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	2.000E-08	3.000E-07	---	DIFFL
R021 *	in contaminated zone soil	2.000E-06	2.000E-06	---	DIFCZ
R021 *	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMIX
R021 *	Average annual wind speed (m/sec)	6.700E+00	2.000E+00	---	WIND
R021 *	Average building air exchange rate (1/hr)	1.000E+00	5.000E-01	---	REXG
R021 *	Height of the building (room) (m)	2.500E+00	2.500E+00	---	HRM
R021 *	Building interior area factor	1.000E+00	0.000E+00	---	FAI
R021 *	Building depth below ground surface (m)	1.000E+00	-1.000E+00	---	DMFL
R021 *	Emanating power of Rn-222 gas	2.000E-01	2.500E-01	---	EMANA(1)

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Site-Specific Parameter Summary (continued)

Menu *	Parameter	* User	* Input	* Default	* (If different from user input)	* Used by RESRAD	* Parameter Name
*****	*****	*****	*****	*****	*****	*****	*****
R021 *	Emanating power of Rn-220 gas	* not used	* 1.500E-01 *	---			* EMANA(2)
*****	*****	*****	*****	*****	*****	*****	*****

Summary of Pathway Selections

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

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area: 4900.00 square meters		U-234	4.260E+01
Thickness: 2.70 meters		U-235	8.700E-01
Cover Depth: 0.00 meters		U-238	8.700E+01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 10 mrem/yr

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

t (years): 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03 3.000E+03 1.000E+04

TDOSE(t): 2.782E+01 2.760E+01 2.716E+01 2.569E+01 2.190E+01 1.256E+01 2.637E+00 2.191E-01 0.000E+00 1.102E-01

M(t): 2.782E+00 2.760E+00 2.716E+00 2.569E+00 2.190E+00 1.256E+00 2.637E-01 2.191E-02 0.000E+00 1.102E-01

Maximum TDOSE(t): 4.252E+02 mrem/yr at t = 3366 p 3 years

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

As mrem/yr and Fraction of Total Dose At t = 3366 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
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
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 = 3366 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
U-234	1.304E+02	0.3066	2.146E-01	0.0005	1.057E-04	0.0000	1.003E+01	0.0236	2.326E-01	0.0005	8.982E-01	0.0021	1.418E+02	0.3334
U-235	2.641E+00	0.0062	5.365E-03	0.0000	0.000E+00	0.0000	2.031E-01	0.0005	5.309E-03	0.0000	1.749E-02	0.0000	2.872E+00	0.0068
U-238	2.581E+02	0.6069	4.247E-01	0.0010	1.124E-04	0.0000	1.985E+01	0.0467	4.604E-01	0.0011	1.778E+00	0.0042	2.806E+02	0.6599
Total	3.911E+02	0.9198	6.446E-01	0.0015	2.182E-04	0.0000	3.008E+01	0.0707	6.983E-01	0.0016	2.693E+00	0.0063	4.252E+02	1.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
U-234	9.828E-03	0.0004	4.076E+00	0.1465	0.000E+00	0.0000	2.629E+00	0.0945	4.251E-02	0.0015	1.042E-01	0.0037	3.300E-01	0.0119
U-235	3.713E-01	0.0133	7.757E-02	0.0028	0.000E+00	0.0000	5.066E-02	0.0018	8.190E-04	0.0000	2.007E-03	0.0001	6.359E-03	0.0002
U-238	6.647E+00	0.2389	7.442E+00	0.2675	0.000E+00	0.0000	5.104E+00	0.1835	8.252E-02	0.0030	2.022E-01	0.0073	6.407E-01	0.0230
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
Total	7.028E+00	0.2526	1.160E+01	0.4168	0.000E+00	0.0000	7.784E+00	0.2798	1.258E-01	0.0045	3.084E-01	0.0111	9.770E-01	0.0351

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
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	7.192E+00	0.2585
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	5.087E-01	0.0183
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	2.012E+01	0.7232
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.782E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	9.751E-03	0.0004	4.044E+00	0.1465	1.220E-07	0.0000	2.608E+00	0.0945	4.217E-02	0.0015	1.034E-01	0.0037	3.274E-01	0.0119
U-235	3.683E-01	0.0133	7.698E-02	0.0028	0.000E+00	0.0000	5.043E-02	0.0018	8.306E-04	0.0000	1.992E-03	0.0001	6.314E-03	0.0002
U-238	6.594E+00	0.2389	7.383E+00	0.2675	2.352E-13	0.0000	5.063E+00	0.1835	8.186E-02	0.0030	2.006E-01	0.0073	6.356E-01	0.0230
Total	6.973E+00	0.2526	1.150E+01	0.4168	1.220E-07	0.0000	7.722E+00	0.2798	1.249E-01	0.0045	3.060E-01	0.0111	9.693E-01	0.0351

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
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	7.135E+00	0.2585
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	5.049E-01	0.0183
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	1.996E+01	0.7232
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.760E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	Nuclide		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
U-234	9.601E-03	0.0004	3.980E+00	0.1465	1.091E-06	0.0000	2.567E+00	0.0945	4.150E-02	0.0015	1.017E-01	0.0037	3.222E-01	0.0119
U-235	3.625E-01	0.0133	7.580E-02	0.0028	0.000E+00	0.0000	4.997E-02	0.0018	8.526E-04	0.0000	1.960E-03	0.0001	6.225E-03	0.0002
U-238	6.490E+00	0.2389	7.266E+00	0.2675	6.294E-12	0.0000	4.983E+00	0.1835	8.056E-02	0.0030	1.975E-01	0.0073	6.255E-01	0.0230
Total	6.862E+00	0.2526	1.132E+01	0.4168	1.091E-06	0.0000	7.600E+00	0.2798	1.229E-01	0.0045	3.011E-01	0.0111	9.539E-01	0.0351

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	Nuclide		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
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	7.022E+00	0.2585
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	4.973E-01	0.0183
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	1.964E+01	0.7232
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.716E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
U-234	9.126E-03	0.0004	3.754E+00	0.1465	1.186E-05	0.0000	2.428E+00	0.0945	3.925E-02	0.0015	9.619E-02	0.0037	3.047E-01	0.0119
U-235	3.428E-01	0.0133	7.191E-02	0.0028	0.000E+00	0.0000	4.848E-02	0.0019	9.266E-04	0.0000	1.854E-03	0.0001	5.932E-03	0.0002
U-238	6.137E+00	0.2389	6.871E+00	0.2675	2.261E-10	0.0000	4.712E+00	0.1834	7.619E-02	0.0030	1.867E-01	0.0073	5.915E-01	0.0230
Total	6.489E+00	0.2526	1.071E+01	0.4168	1.186E-05	0.0000	7.189E+00	0.2798	1.164E-01	0.0045	2.848E-01	0.0111	9.022E-01	0.0351

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

	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.	
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	6.641E+00	0.2585
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	4.719E-01	0.0184
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	1.858E+01	0.7231
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.569E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	8.165E-03	0.0004	3.210E+00	0.1465	1.002E-04	0.0000	2.070E+00	0.0945	3.346E-02	0.0015	8.199E-02	0.0037	2.599E-01	0.0119
U-235	2.924E-01	0.0134	5.233E-02	0.0028	0.000E+00	0.0000	4.485E-02	0.0020	1.109E-03	0.0001	1.581E-03	0.0001	5.212E-03	0.0002
U-238	5.231E+00	0.2388	5.857E+00	0.2674	5.596E-09	0.0000	4.017E+00	0.1834	6.494E-02	0.0030	1.592E-01	0.0073	5.042E-01	0.0230
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Total	5.532E+00	0.2525	9.130E+00	0.4168	1.002E-04	0.0000	6.132E+00	0.2799	9.951E-02	0.0045	2.427E-01	0.0111	7.693E-01	0.0351

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.663E+00	0.2586
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	4.075E-01	0.0186
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.583E+01	0.7228
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.190E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
U-234	8.257E-03	0.0007	1.840E+00	0.1465	9.015E-04	0.0001	1.189E+00	0.0947	1.921E-02	0.0015	4.693E-02	0.0037	1.489E-01	0.0119
U-235	1.681E-01	0.0134	3.996E-02	0.0032	0.000E+00	0.0000	3.612E-02	0.0029	1.492E-03	0.0001	9.082E-04	0.0001	3.528E-03	0.0003
U-238	2.991E+00	0.2382	3.350E+00	0.2667	1.542E-07	0.0000	2.297E+00	0.1829	3.714E-02	0.0030	9.103E-02	0.0072	2.843E-01	0.0230
Total	3.167E+00	0.2522	5.229E+00	0.4164	9.016E-04	0.0001	3.522E+00	0.2805	5.784E-02	0.0046	1.389E-01	0.0111	4.408E-01	0.0351

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
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	3.253E+00	0.2591
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	2.501E-01	0.0199
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.054E+00	0.7210
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	1.256E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
U-234	2.112E-02	0.0080	3.813E-01	0.1446	4.758E-03	0.0018	2.737E-01	0.1038	4.397E-03	0.0017	9.888E-03	0.0037	3.135E-02	0.0119
U-235	3.550E-02	0.0135	1.504E-02	0.0057	0.000E+00	0.0000	2.292E-02	0.0087	1.542E-03	0.0006	1.905E-04	0.0001	1.564E-03	0.0006
U-238	6.055E-01	0.2296	6.785E-01	0.2573	1.917E-06	0.0000	4.653E-01	0.1765	7.523E-03	0.0029	1.844E-02	0.0070	5.841E-02	0.0221
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
Total	6.621E-01	0.2511	1.075E+00	0.4076	4.760E-03	0.0018	7.620E-01	0.2890	1.346E-02	0.0051	2.852E-02	0.0108	9.132E-02	0.0346

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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A		A A A A A A A A A A A A A A A A	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
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	7.266E-01	0.2755
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	7.675E-02	0.0291
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	1.834E+00	0.6954
A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A	A A A A A A A A A A A A A A A A
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.637E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	6.055E-02	0.2763	1.284E-02	0.0586	1.398E-02	0.0638	1.071E-01	0.4886	1.675E-03	0.0076	1.306E-03	0.0060	3.027E-03	0.0138
U-235	7.761E-04	0.0035	3.099E-03	0.0141	0.000E+00	0.0000	6.909E-03	0.0315	5.476E-04	0.0025	3.628E-06	0.0000	3.777E-04	0.0017
U-238	2.300E-03	0.0105	2.547E-03	0.0116	9.291E-06	0.0000	1.811E-03	0.0083	2.924E-05	0.0001	6.981E-05	0.0003	2.205E-04	0.0010
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Total	6.363E-02	0.2904	1.848E-02	0.0843	1.399E-02	0.0638	1.158E-01	0.5284	2.252E-03	0.0103	1.379E-03	0.0063	3.625E-03	0.0165

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

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA		AAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.004E-01	0.9147
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	1.171E-02	0.0535
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.987E-03	0.0319
AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA	AAAAA
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.191E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+03 years

Water Dependent Pathways

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

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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+04 years

Water Independent Pathways (Inhalation excludes radon)

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

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+04 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
U-234	6.137E-01	0.5568	1.363E-02	0.0124	1.906E-02	0.0173	4.738E-02	0.0430	2.715E-03	0.0025	3.137E-03	0.0028	6.996E-01	0.6347
U-235	3.556E-01	0.3227	4.309E-03	0.0039	0.000E+00	0.0000	2.736E-02	0.0248	2.121E-03	0.0019	6.790E-05	0.0001	3.895E-01	0.3534
U-238	1.148E-02	0.0104	2.550E-04	0.0002	3.570E-04	0.0003	8.866E-04	0.0008	5.081E-05	0.0000	5.872E-05	0.0001	1.309E-02	0.0119
Total	9.808E-01	0.8899	1.819E-02	0.0165	1.942E-02	0.0176	7.562E-02	0.0686	4.886E-03	0.0044	3.263E-03	0.0030	1.102E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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

Parent (i)	Product (j)	Branch Fraction	DSR(j,t) (mrem/yr)/(pCi/g)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	3.000E+03	1.000E+04
U-234	U-234	1.000E+00	1.688E-01	1.675E-01	1.648E-01	1.559E-01	1.329E-01	7.594E-02	1.537E-02	5.724E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	2.734E-06	8.058E-06	2.604E-05	7.219E-05	1.862E-04	3.072E-04	3.355E-04	0.000E+00	1.627E-06	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	2.437E-08	2.178E-07	2.365E-06	2.000E-05	1.800E-04	9.516E-04	2.845E-03	0.000E+00	3.734E-03	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	1.921E-10	4.062E-09	1.278E-07	2.763E-06	5.569E-05	4.321E-04	1.467E-03	0.000E+00	1.269E-02	0.000E+00	0.000E+00
U-234	DSR(j)		1.688E-01	1.675E-01	1.648E-01	1.559E-01	1.329E-01	7.636E-02	1.706E-02	4.705E-03	0.000E+00	1.642E-02	0.000E+00	0.000E+00
U-235	U-235	1.000E+00	5.847E-01	5.801E-01	5.709E-01	5.398E-01	4.601E-01	2.631E-01	5.326E-02	1.988E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	2.447E-04	7.230E-04	2.326E-03	6.342E-03	1.532E-02	2.000E-02	7.456E-03	0.000E+00	1.011E-01	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	3.504E-06	2.882E-05	2.830E-04	1.907E-03	9.068E-03	1.497E-02	5.809E-03	0.000E+00	3.466E-01	0.000E+00	0.000E+00
U-235	DSR(j)		5.847E-01	5.803E-01	5.716E-01	5.425E-01	4.684E-01	2.875E-01	8.822E-02	1.346E-02	0.000E+00	4.477E-01	0.000E+00	0.000E+00

U-238	U-238	1.000E+00	2.313E-01	2.294E-01	2.258E-01	2.135E-01	1.820E-01	1.040E-01	2.106E-02	7.863E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	4.814E-07	1.408E-06	4.425E-06	1.130E-05	2.154E-05	1.307E-05	1.625E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	3.927E-12	3.430E-11	3.647E-10	2.949E-09	2.293E-08	8.291E-08	1.189E-07	0.000E+00	1.599E-08	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	2.301E-14	6.153E-13	2.210E-11	5.470E-10	1.507E-08	1.877E-07	9.259E-07	0.000E+00	3.424E-05	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	1.499E-16	9.011E-15	9.225E-13	5.960E-11	3.963E-09	8.001E-08	4.745E-07	0.000E+00	1.162E-04	0.000E+00	0.000E+00
U-238	DSR(j)		2.313E-01	2.294E-01	2.258E-01	2.135E-01	1.820E-01	1.041E-01	2.108E-02	8.031E-05	0.000E+00	1.505E-04	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)*... BRF(j).

The DSR includes contributions from associated (half-life μ 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g

Basic Radiation Dose Limit = 10 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	3.000E+03	1.000E+04
U-234	5.923E-01	5.970E-01	6.066E-01	6.414E-01	7.522E-01	1.310E+02	5.863E+02	2.125E+03	*6.245E+09	6.089E+02	6.089E+02
U-235	1.710E-01	1.723E-01	1.749E-01	1.843E-01	2.135E-01	3.479E-01	1.133E-02	7.427E-02	*2.160E+06	2.234E-01	2.234E-01
U-238	4.324E-01	4.359E-01	4.429E-01	4.684E-01	5.495E-01	9.609E-01	4.744E-02	1.245E-05	*3.360E+05	6.645E-04	6.645E-04

*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)

and Single Radionuclide Soil Guidelines G(i,t) in pCi/g

at tmin = time of minimum single radionuclide soil guideline

and at tmax = time of maximum total dose = 3366 p 3 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
U-234	4.260E+01	3366 p 3	3.328E+00	3.005E+00	3.328E+00	3.005E+00
U-235	8.700E-01	3366 p 3	3.301E+00	3.029E+00	3.301E+00	3.029E+00
U-238	8.700E-01	3366 p 3	3.225E+00	3.100E+00	3.225E+00	3.100E+00

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

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

Nuclide	Parent	BRF(i)	DOSE(j,t), mrem/yr											
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	3.000E+03	1.000E+04	
U-234	U-234	1.000E+00	7.192E+00	7.135E+00	7.022E+00	6.640E+00	5.659E+00	3.235E+00	6.546E-01	2.439E-03	0.000E+00	0.000E+00	0.000E+00	
U-234	U-238	1.000E+00	0.000E+00	4.188E-05	1.225E-04	3.850E-04	9.835E-04	1.874E-03	1.137E-03	1.414E-05	0.000E+00	0.000E+00	0.000E+00	
U-234	ADOSE(j):		7.192E+00	7.135E+00	7.022E+00	6.640E+00	5.660E+00	3.237E+00	6.557E-01	2.453E-03	0.000E+00	0.000E+00	0.000E+00	
Th-230	U-234	1.000E+00	0.000E+00	1.165E-04	3.433E-04	1.109E-03	3.075E-03	7.933E-03	1.308E-02	1.429E-02	0.000E+00	6.933E-05	0.000E+00	
Th-230	U-238	1.000E+00	0.000E+00	3.417E-10	2.984E-09	3.173E-08	2.565E-07	1.995E-06	7.213E-06	1.034E-05	0.000E+00	1.391E-06	0.000E+00	
Th-230	ADOSE(j):		0.000E+00	1.165E-04	3.433E-04	1.109E-03	3.075E-03	7.935E-03	1.309E-02	1.430E-02	0.000E+00	7.072E-05	0.000E+00	
Ra-226	U-234	1.000E+00	0.000E+00	1.038E-06	9.279E-06	1.008E-04	8.521E-04	7.669E-03	4.054E-02	1.212E-01	0.000E+00	1.591E-01	0.000E+00	
Ra-226	U-238	1.000E+00	0.000E+00	2.002E-12	5.353E-11	1.922E-09	4.758E-08	1.311E-06	1.633E-05	8.056E-05	0.000E+00	2.979E-03	0.000E+00	
Ra-226	ADOSE(j):		0.000E+00	1.038E-06	9.279E-06	1.008E-04	8.521E-04	7.670E-03	4.055E-02	1.213E-01	0.000E+00	1.620E-01	0.000E+00	
Pb-210	U-234	1.000E+00	0.000E+00	8.183E-09	1.730E-07	5.446E-06	1.177E-04	2.373E-03	1.841E-02	6.250E-02	0.000E+00	5.405E-01	0.000E+00	
Pb-210	U-238	1.000E+00	0.000E+00	1.304E-14	7.839E-13	8.025E-11	5.185E-09	3.448E-07	6.961E-06	4.128E-05	0.000E+00	1.011E-02	0.000E+00	
Pb-210	ADOSE(j):		0.000E+00	8.183E-09	1.730E-07	5.446E-06	1.177E-04	2.373E-03	1.841E-02	6.254E-02	0.000E+00	5.506E-01	0.000E+00	
U-235	U-235	1.000E+00	5.087E-01	5.047E-01	4.967E-01	4.697E-01	4.003E-01	2.289E-01	4.634E-02	1.730E-04	0.000E+00	0.000E+00	0.000E+00	
Pa-231	U-235	1.000E+00	0.000E+00	2.129E-04	6.290E-04	2.023E-03	5.517E-03	1.333E-02	1.740E-02	6.487E-03	0.000E+00	8.795E-02	0.000E+00	
Ac-227	U-235	1.000E+00	0.000E+00	3.048E-06	3.508E-05	2.462E-04	1.659E-03	7.889E-03	1.302E-02	5.054E-03	0.000E+00	3.015E-01	0.000E+00	
U-238	U-238	1.000E+00	2.012E+01	1.996E+01	1.964E+01	1.857E+01	1.583E+01	9.052E+00	1.833E+00	6.841E-03	0.000E+00	0.000E+00	0.000E+00	

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

Summary : Post-closure Pathways analysis - WELL DEPTH IMPACTS

File : BERUS3.DAT

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t), pCi/g										
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	3.000E+03	1.000E+04
U-234	U-234	1.000E+00	4.260E+01	4.226E+01	4.159E+01	3.933E+01	3.352E+01	1.916E+01	3.877E+00	1.444E-02	1.660E-09	8.552E-34	
U-234	U-238	1.000E+00	0.000E+00	2.447E-04	7.224E-04	2.277E-03	5.823E-03	1.110E-02	6.737E-03	8.374E-05	2.896E-11	5.022E-35	
U-234	ΔS(j):		4.260E+01	4.226E+01	4.159E+01	3.933E+01	3.353E+01	1.917E+01	3.884E+00	1.453E-02	1.689E-09	9.054E-34	
Th-230	U-234	1.000E+00	0.000E+00	3.820E-04	1.137E-03	3.685E-03	1.023E-02	2.639E-02	4.354E-02	4.755E-02	4.659E-02	4.333E-02	
Th-230	U-238	1.000E+00	0.000E+00	1.104E-09	9.833E-09	1.053E-07	8.529E-07	6.636E-06	2.400E-05	3.442E-05	3.382E-05	3.146E-05	
Th-230	ΔS(j):		0.000E+00	3.820E-04	1.137E-03	3.686E-03	1.023E-02	2.640E-02	4.356E-02	4.758E-02	4.663E-02	4.337E-02	
Ra-226	U-234	1.000E+00	0.000E+00	8.280E-08	7.405E-07	8.046E-06	6.801E-05	6.122E-04	3.237E-03	9.700E-03	1.265E-02	1.190E-02	
Ra-226	U-238	1.000E+00	0.000E+00	1.596E-13	4.272E-12	1.534E-10	3.798E-09	1.047E-07	1.304E-06	6.447E-06	9.158E-06	8.635E-06	
Ra-226	ΔS(j):		0.000E+00	8.280E-08	7.405E-07	8.047E-06	6.802E-05	6.123E-04	3.238E-03	9.705E-03	1.266E-02	1.191E-02	
Pb-210	U-234	1.000E+00	0.000E+00	8.518E-10	2.253E-08	7.771E-07	1.727E-05	3.514E-04	2.733E-03	9.287E-03	1.233E-02	1.160E-02	
Pb-210	U-238	1.000E+00	0.000E+00	1.233E-15	9.796E-14	1.130E-11	7.570E-10	5.100E-08	1.033E-06	6.133E-06	8.922E-06	8.419E-06	
Pb-210	ΔS(j):		0.000E+00	8.518E-10	2.253E-08	7.771E-07	1.727E-05	3.515E-04	2.734E-03	9.293E-03	1.234E-02	1.161E-02	
U-235	U-235	1.000E+00	8.700E-01	8.631E-01	8.494E-01	8.032E-01	6.846E-01	3.914E-01	7.924E-02	2.958E-04	3.420E-11	1.797E-35	
Pa-231	U-235	1.000E+00	0.000E+00	1.832E-05	5.443E-05	1.755E-04	4.787E-04	1.157E-03	1.510E-03	5.630E-04	2.135E-05	2.252E-10	
Ac-227	U-235	1.000E+00	0.000E+00	2.886E-07	2.520E-06	2.525E-05	1.714E-04	8.168E-04	1.349E-03	5.236E-04	1.986E-05	2.095E-10	
U-238	U-238	1.000E+00	8.700E+01	8.631E+01	8.494E+01	8.032E+01	6.846E+01	3.914E+01	7.924E+00	2.958E-02	3.420E-09	1.797E-33	
U-238	U-238	1.000E+00	8.700E+01	8.631E+01	8.494E+01	8.032E+01	6.846E+01	3.914E+01	7.924E+00	2.958E-02	3.420E-09	1.797E-33	

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