Table F.50. Dose-Rate-per-Unit Waste Concentration Factors (mrem/yr per Ci/m^3) for the Excavation Scenario, Time Since Year 2046

Nuclide	Without Soil Leaching			Dominant Exposure Pathway
	100 yr	300 yr	500 yr	
Tritium	1.09E-03	1.37E-08	1.71E-13	Soil Ing.
Carbon-14	1.10E+03	1.07E+03	1.05E+03	Vegetable
Cobalt-60	1.34E+0	5.07E-12	1.92E-023	External
Nickel-59	2.53E+03	2.53E+01	2.53E+01	External
Nickel-63	1.68E+01	4.21E+0	1.05E+0	Vegetable
Strontium-90	6.43E+03	5.05E+01	3.96E-01	Vegetable
Technetium-99	4.28E+03	4.27E+03	4.27E+03	Vegetable
Iodine-129	1.17E+04	1.17E+04	1.17E+04	Vegetable
Cesium-137	1.81E+04	1.83E+02	1.85E+0	External
Uranium-234	1.13E+04	1.12E+04	1.12E+04	Inhalation
Uranium-235	3.63E+04	3.94E+04	4.25E+04	External
Uranium-236	1.05E+04	1.05E+04	1.05E+04	Inhalation
Uranium-238	1.75E+04	1.75E+04	1.75E+04	Inhalation

ingrowth. These dose factors generally decrease with time as the parent decays, although progeny ingrowth may cause an increase with time. For example, the uranium-235 dose-rate–per-unit waste concentration factors increase with time because of the ingrowth of protactinium-231. The dose-rate-per-unit waste concentration factors for *with soil leaching* are impacted by decay and leaching and are less than or equal to the corresponding value for no leaching.

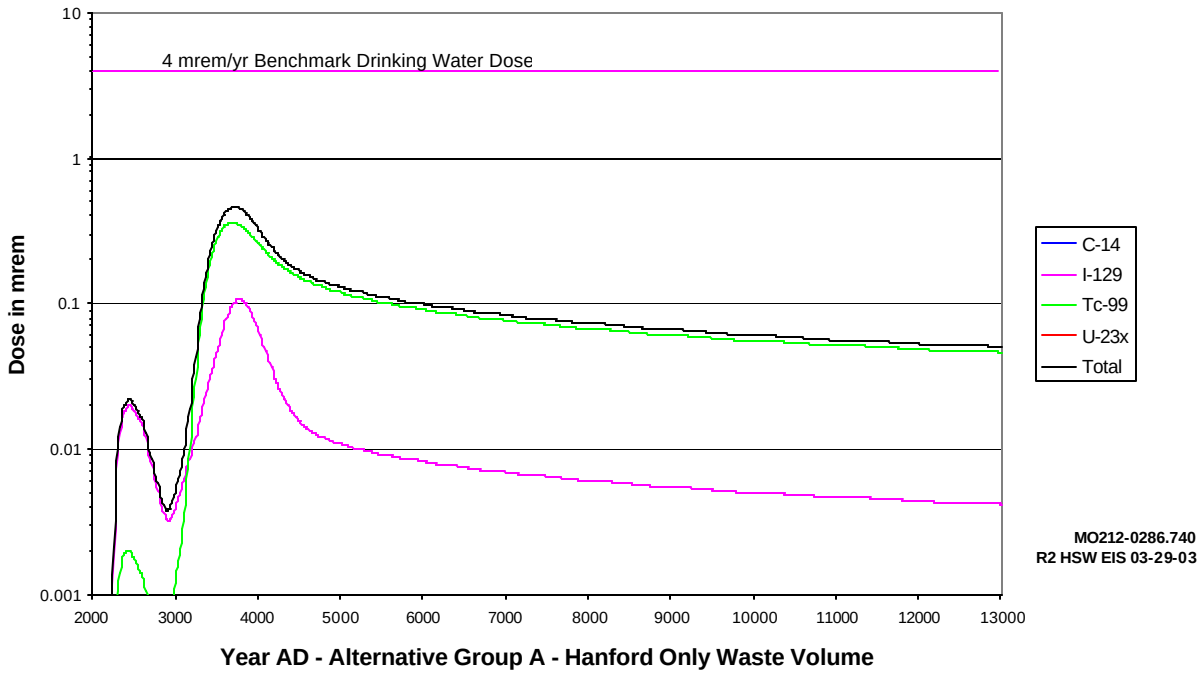
F.4 Impacts from Waterborne Pathways

This section presents additional results to those presented in Section 5.11 for the groundwater analyses, including examples of contributions to impacts by waste type and radionuclide and summaries of potential impacts to the resident gardener at the 1-km points of analysis and the Columbia River point of analysis for all alternative groups.

Graphs of contributions to drinking water dose by radionuclide are presented in the following figures for all alternative groups and for the Hanford Only and Upper Bound waste volumes. For the No Action Alternative, the results are presented only for only for the Hanford Only waste volume, as the results are very similar to those for the Lower Bound waste volume. The content for each figure is indicated in Table F.51.

Table F.51. Content of Figures for Groundwater Analysis Results

Alternative Group	Line of Analysis				
	200 West	ERDF	200 East NW	200 East SE	Columbia River
Group A	F.1	N/A	F.2	F.3	F.4
Group B	F.5	N/A	F.6	N/A	F.7
Group C	F.8	N/A	F.9	F.10	F.11
Group D_1	F.12	N/A	F.13	F.14	F.15
Group D_2	F.16	N/A	F.17	N/A	F.18
Group D_3	F.19	F.20	F.21	N/A	F.22
Group E_1	F.23	F.24	F.25	N/A	F.26
Group E_2	F.27	F.28	F.29	F.30	F.31
Group E_3	F.32	F.33	F.34	F.35	F.36
No Action	F.37	N/A	F.38	N/A	F.39
N/A = not applicable.					



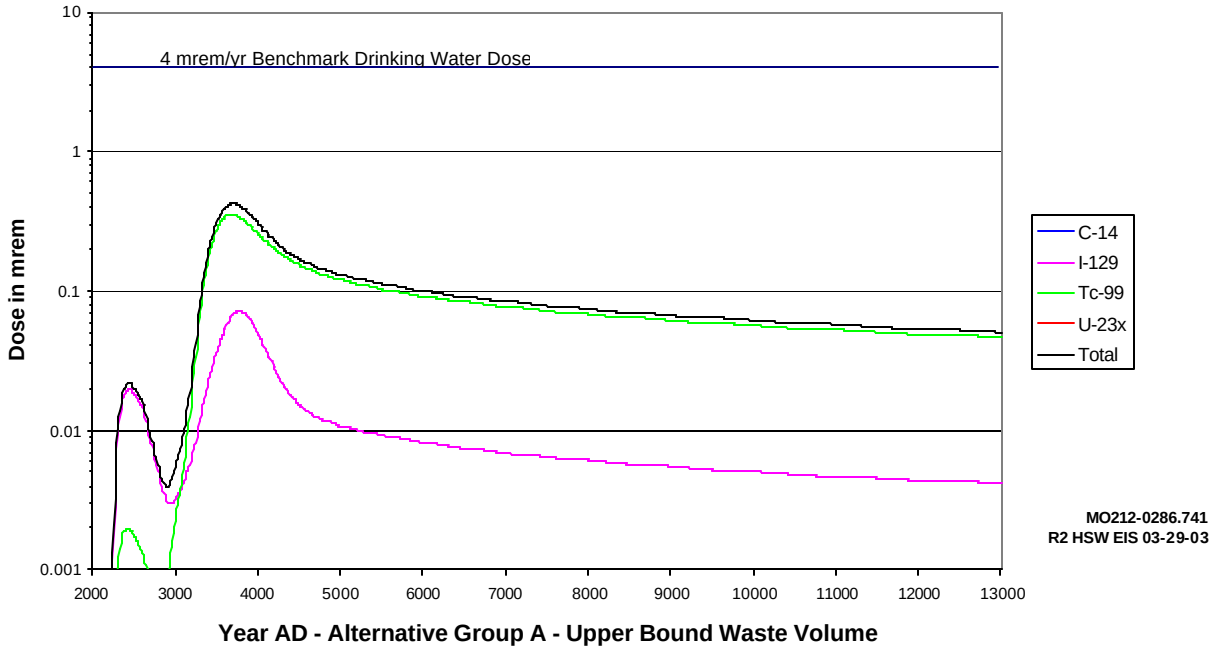
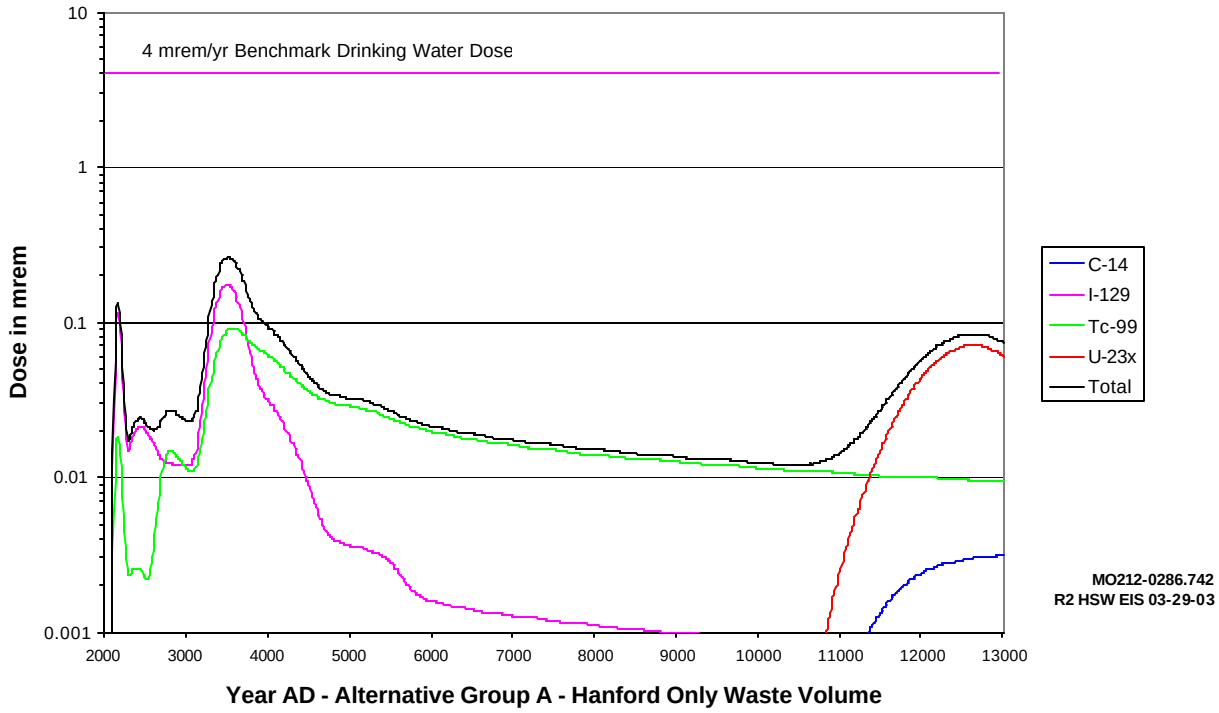


Figure F.1. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from the 200 West Area, Alternative Group A



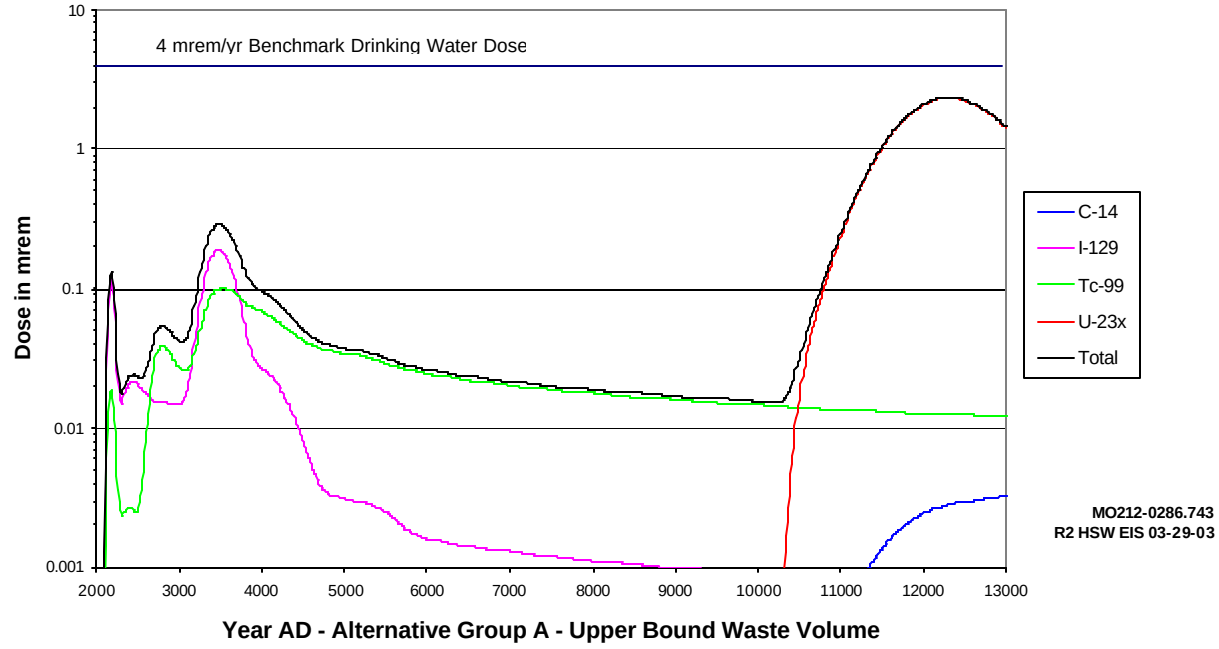
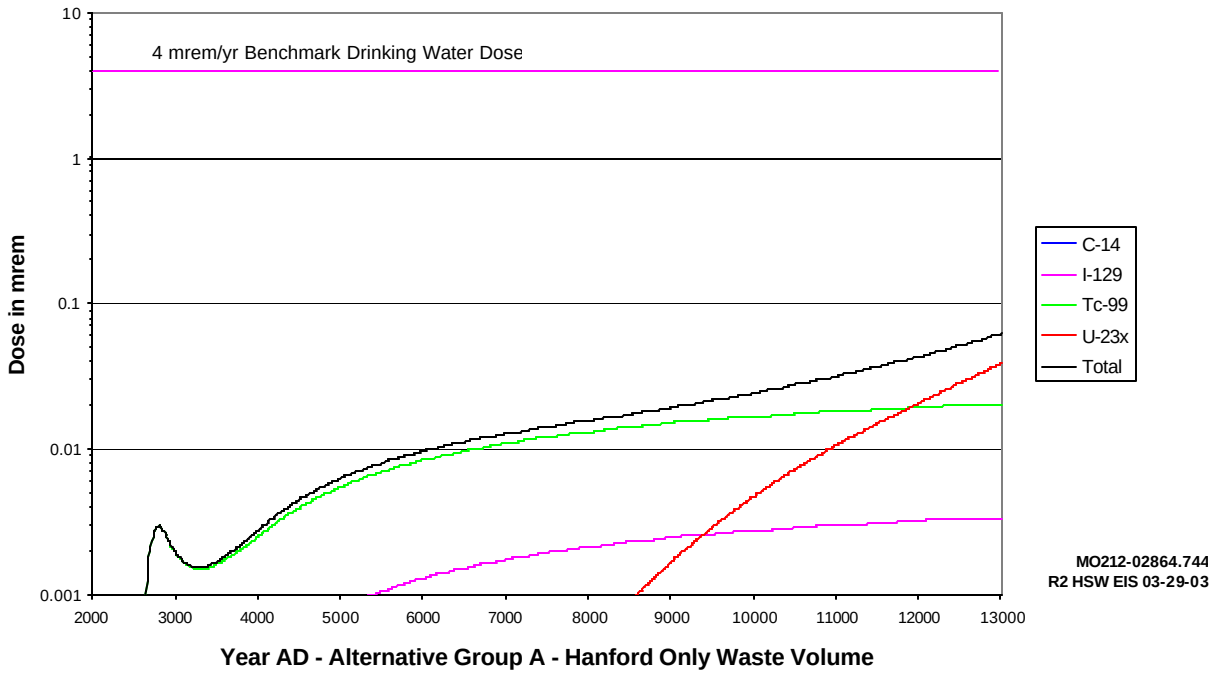


Figure F.2. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group A



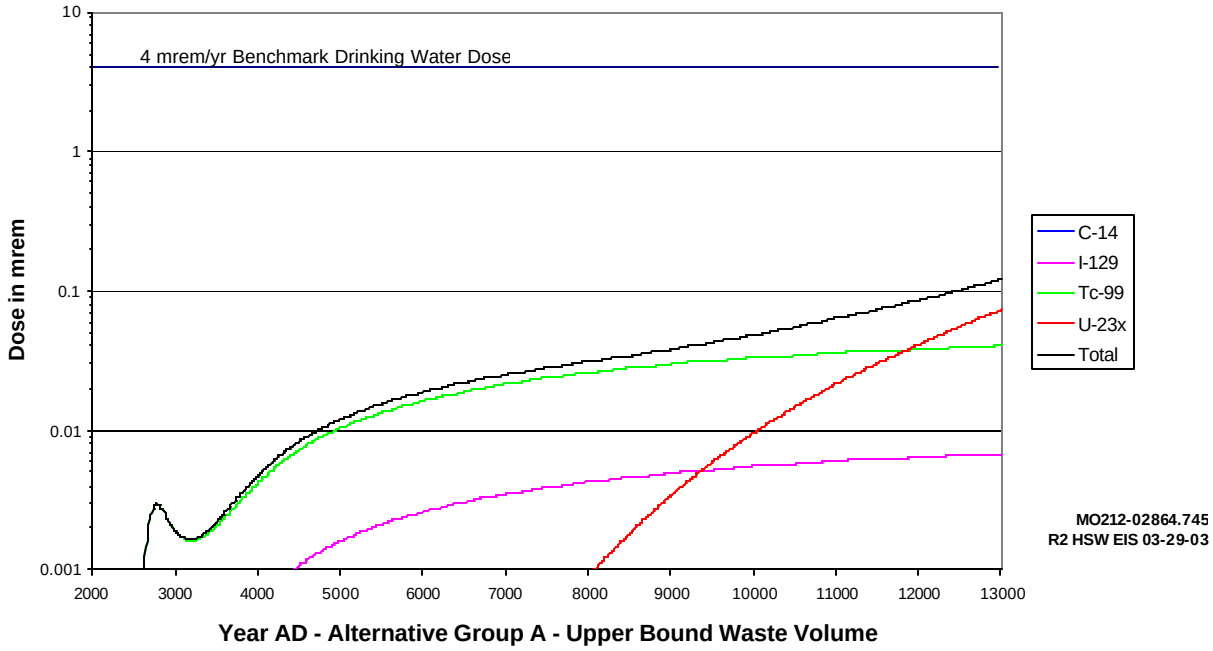
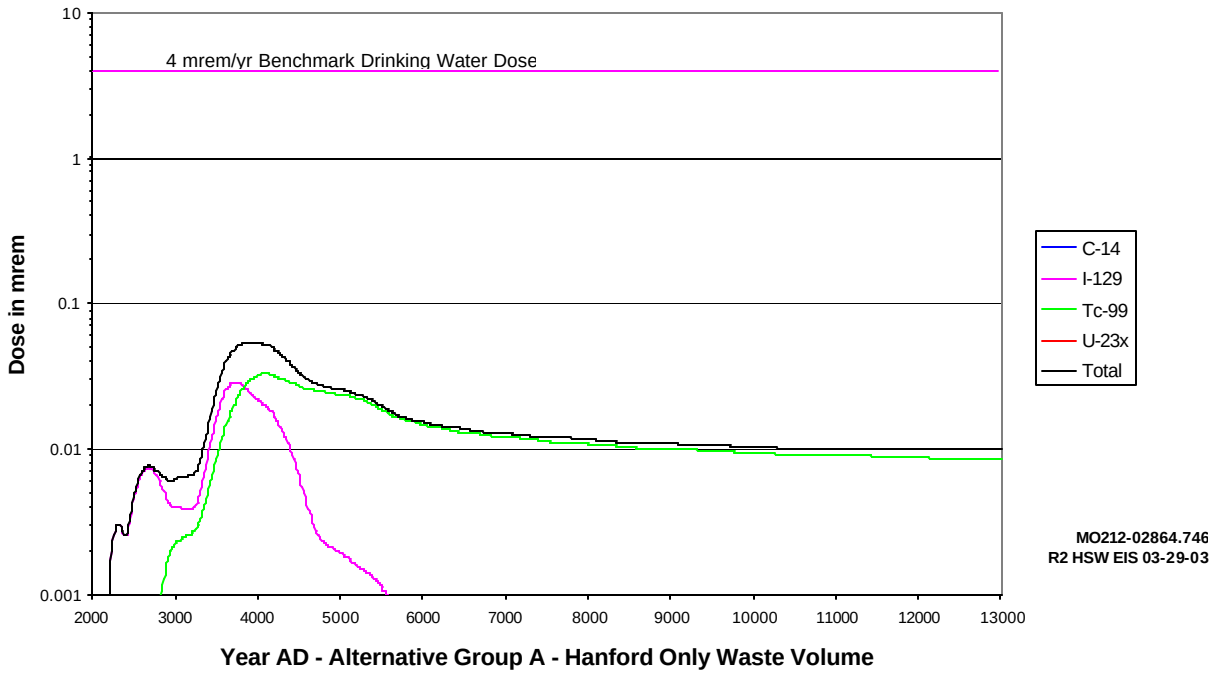


Figure F.3. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Southeast of 200 East Area, Alternative Group A



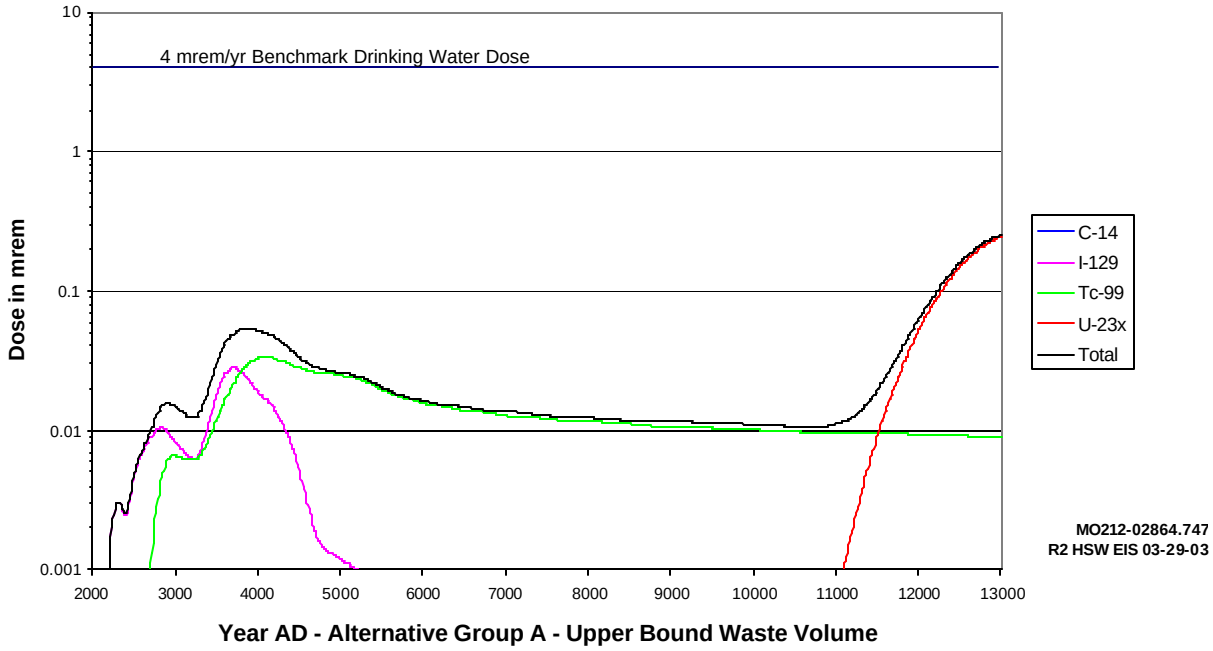
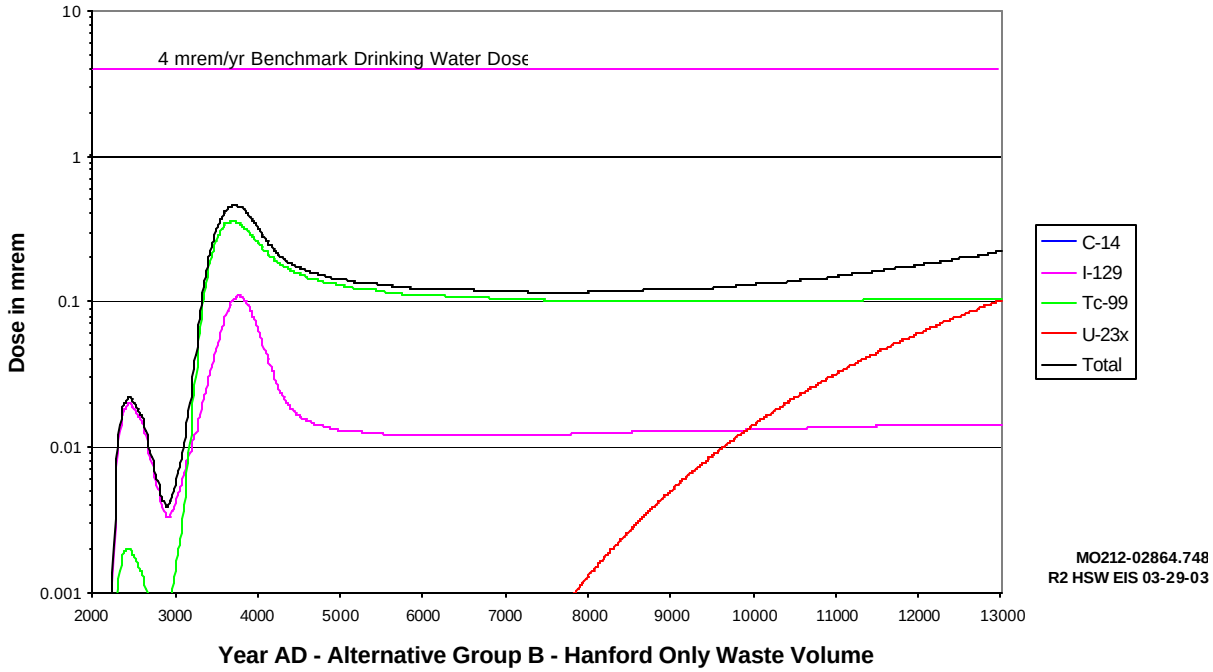


Figure F.4. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River Alternative Group A



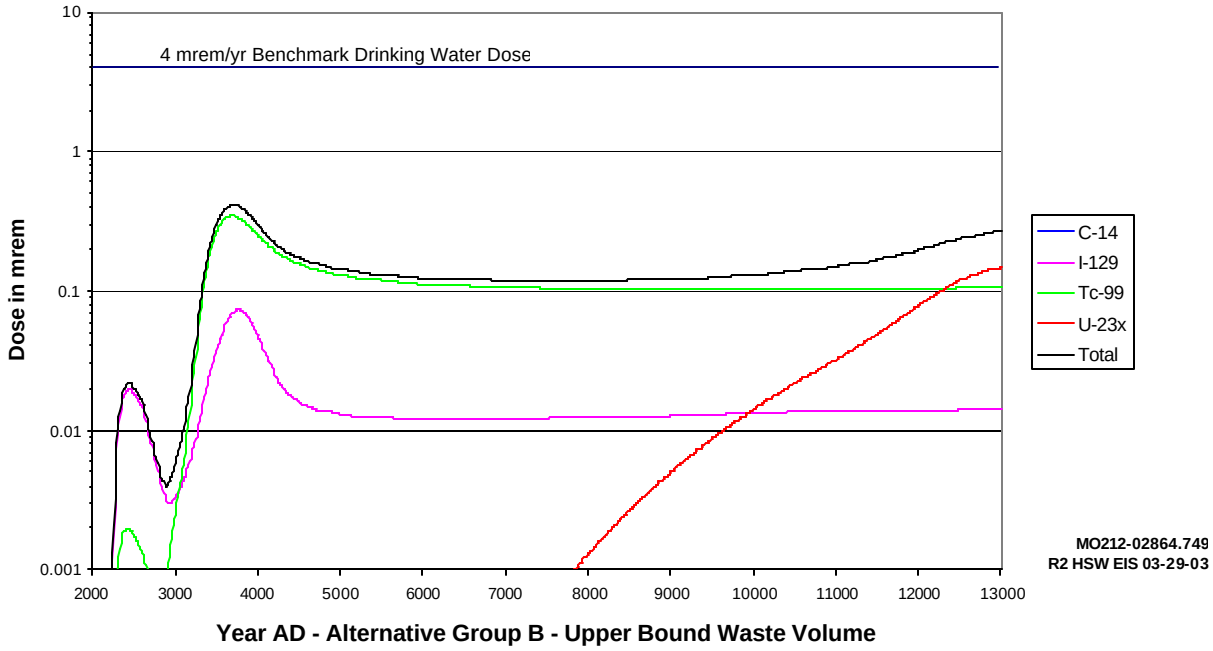
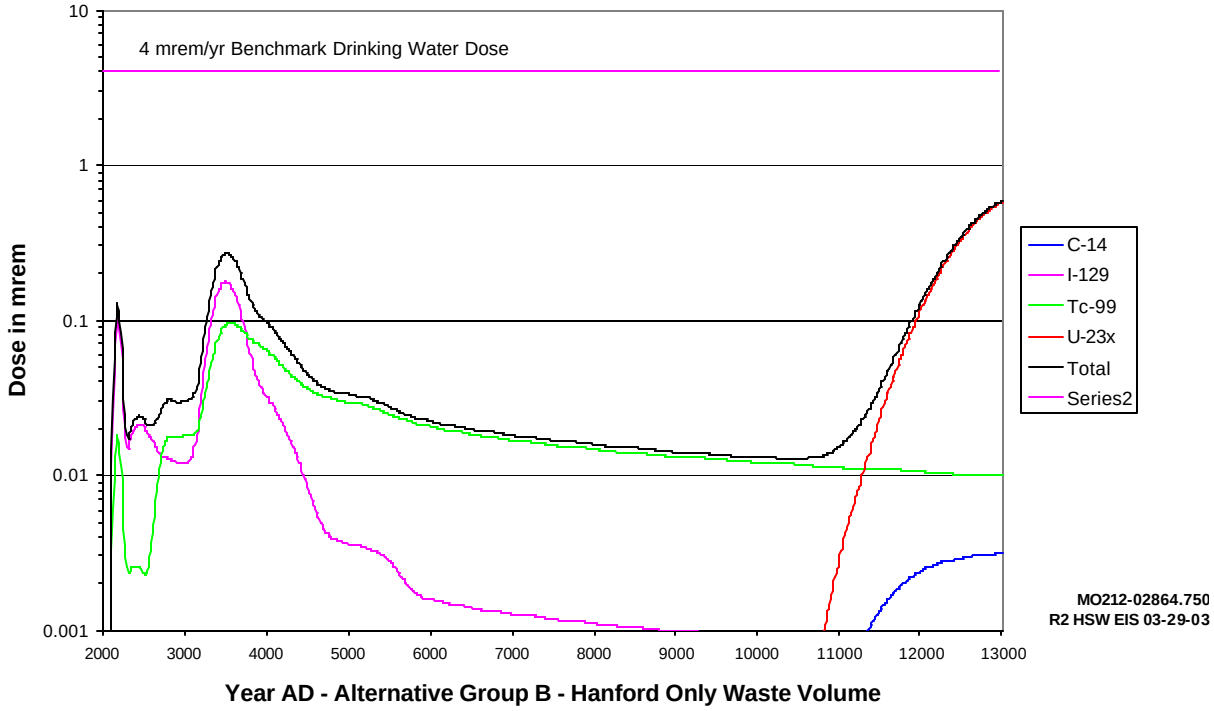


Figure F.5. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group B



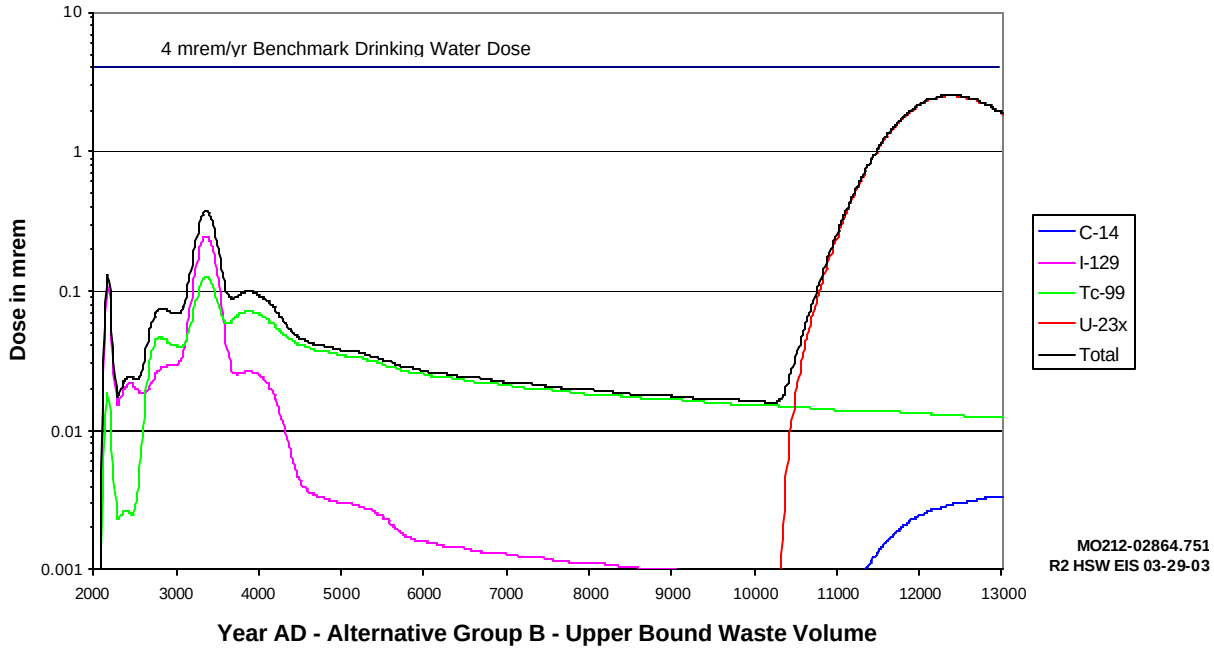
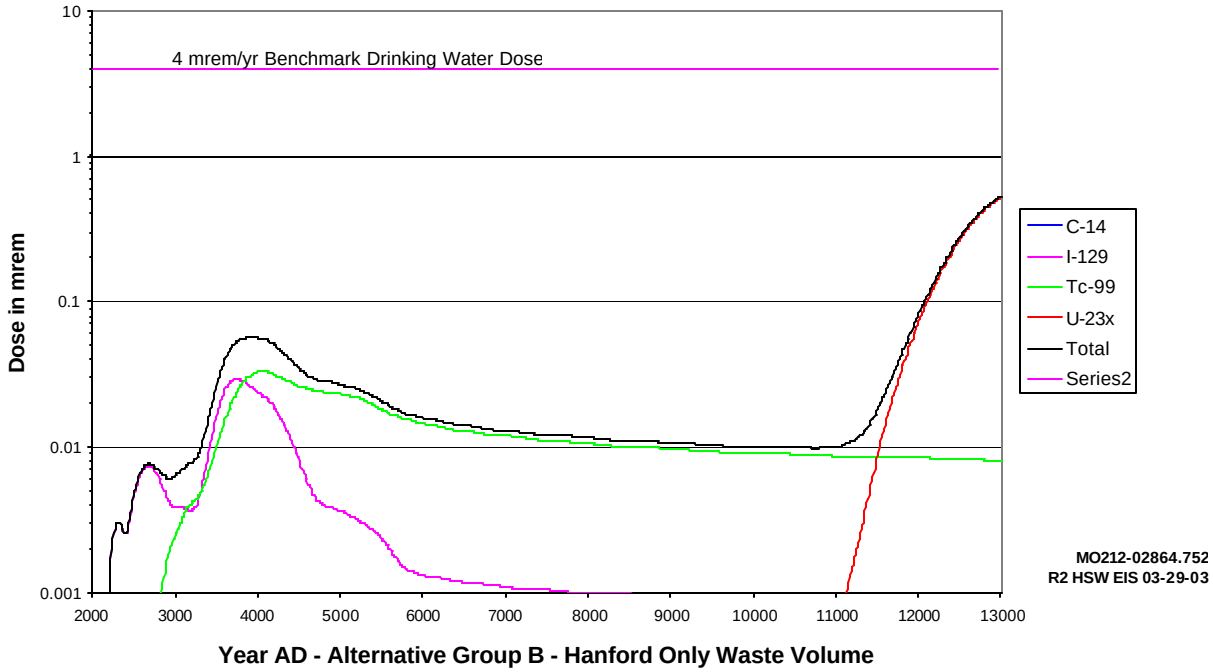


Figure F.6. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group B



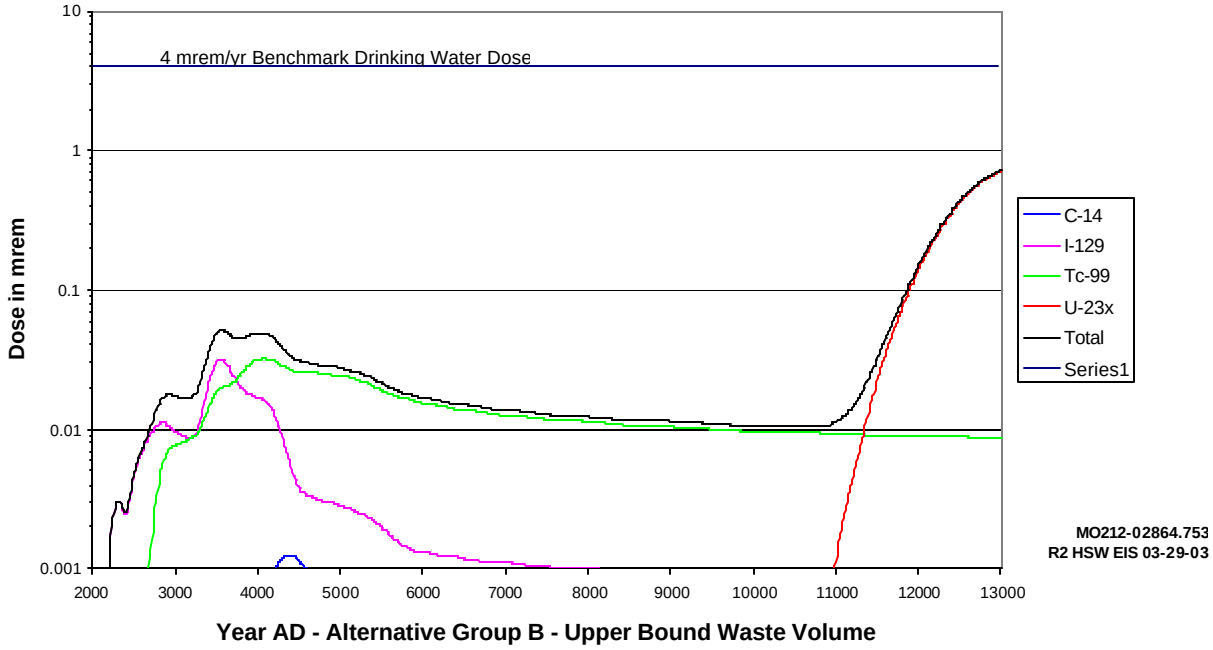
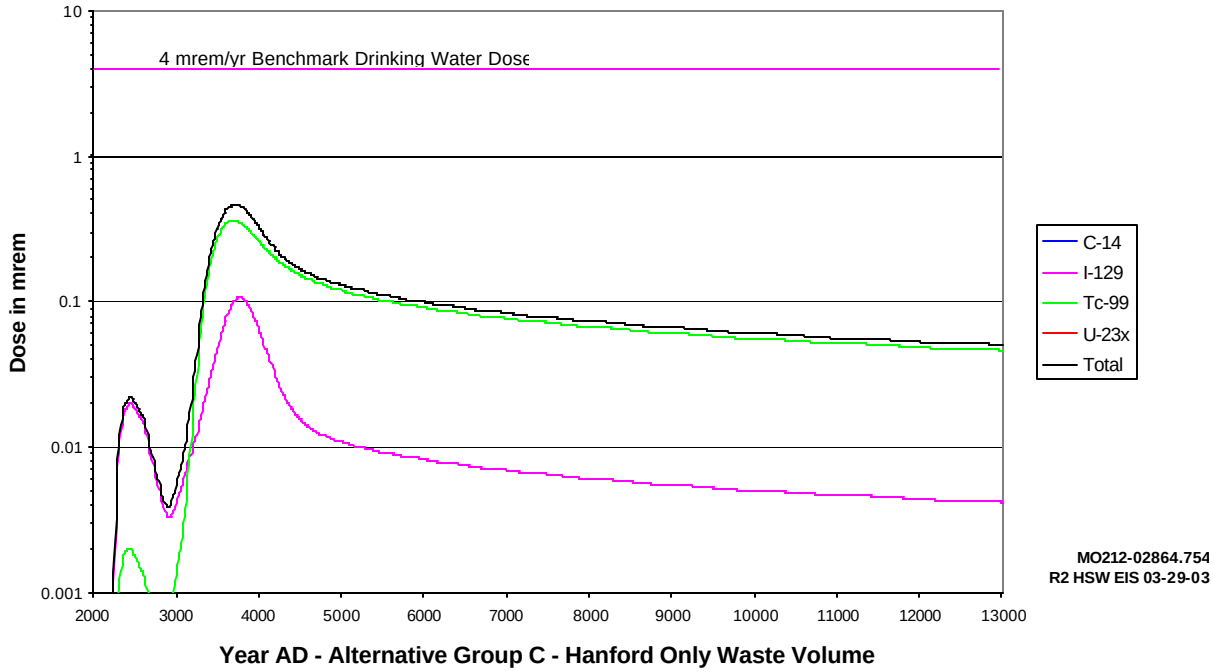


Figure F.7. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group B



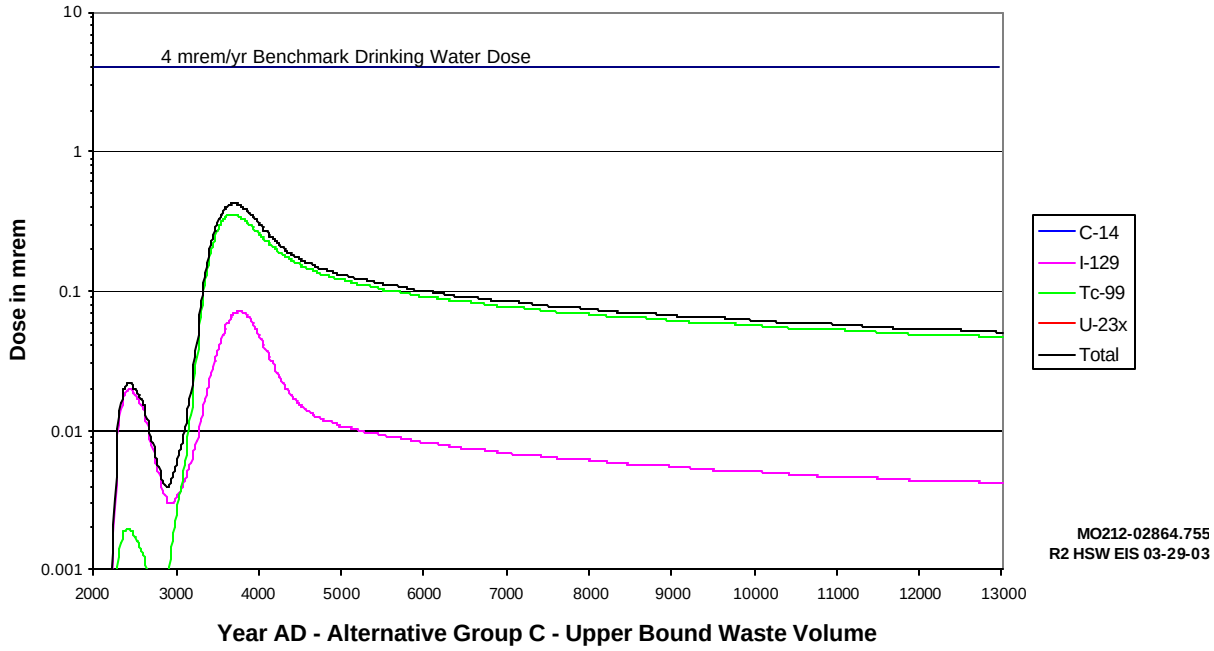
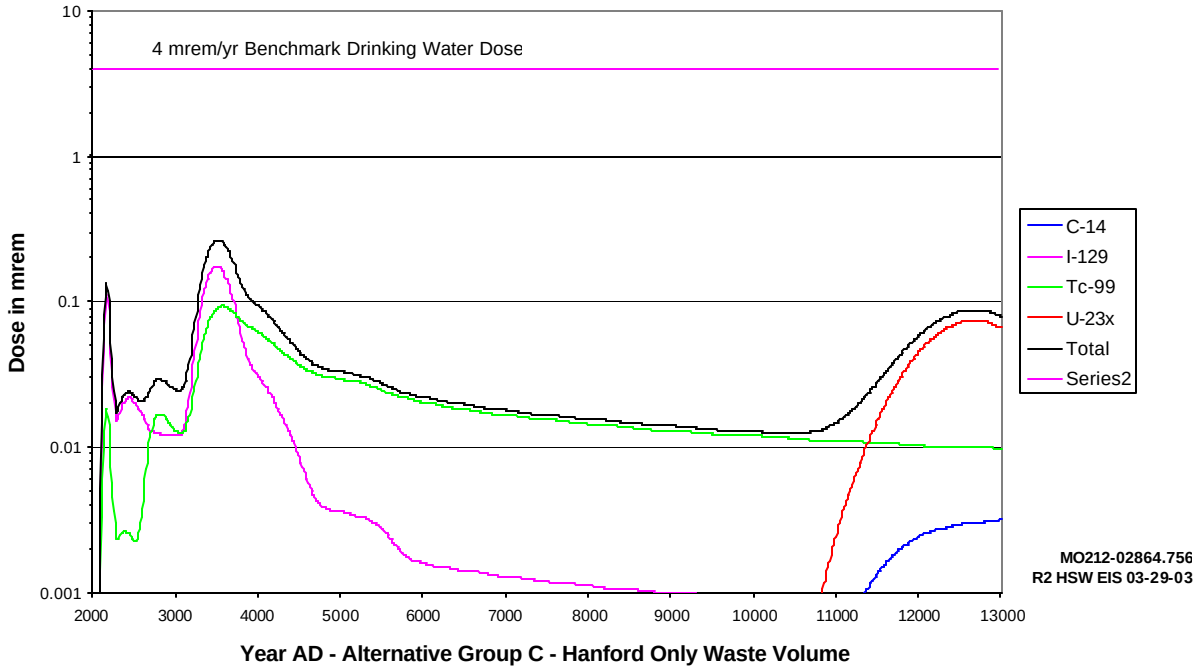


Figure F.8. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group C



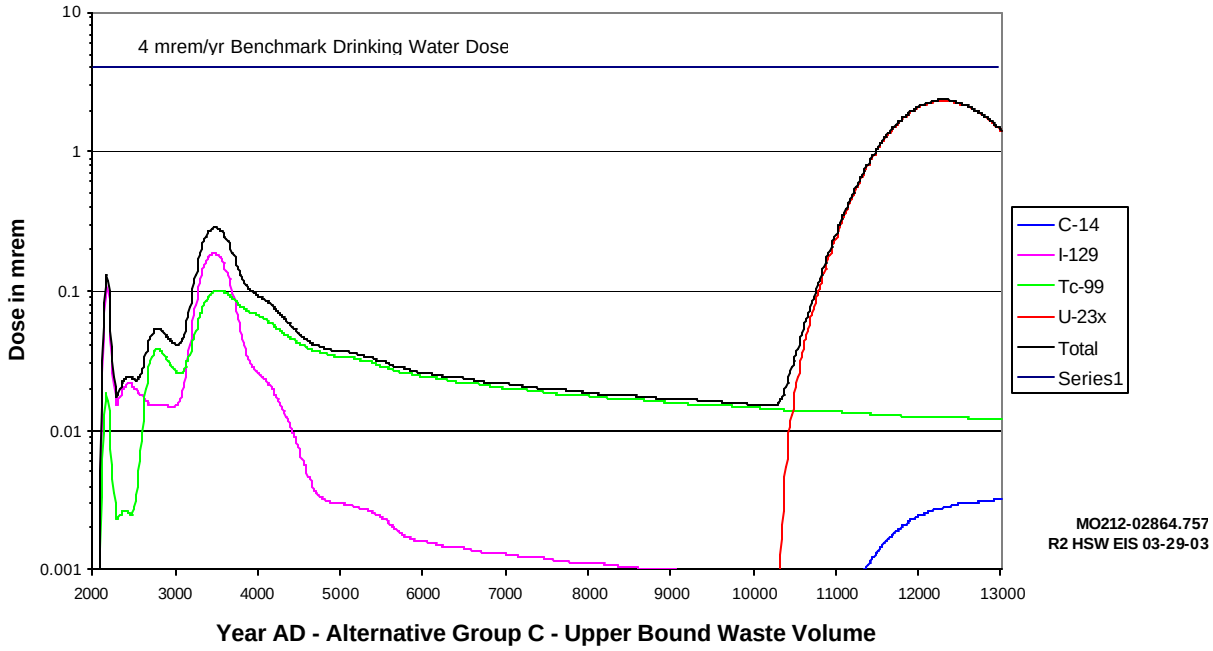
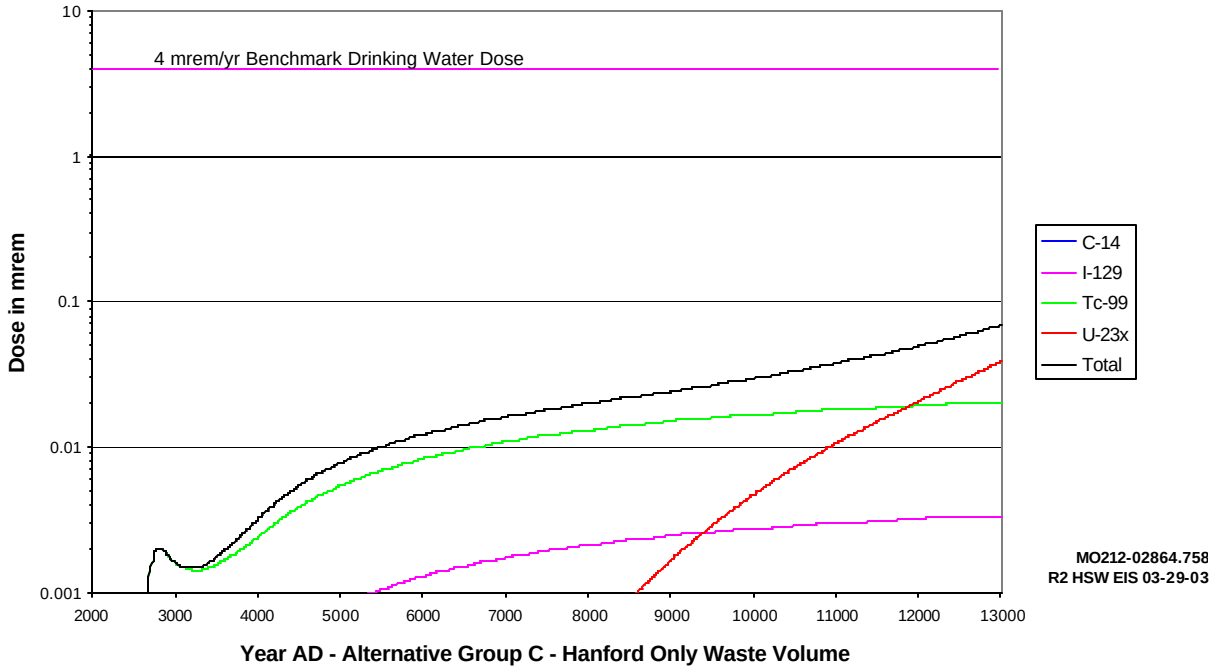


Figure F.9. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group C



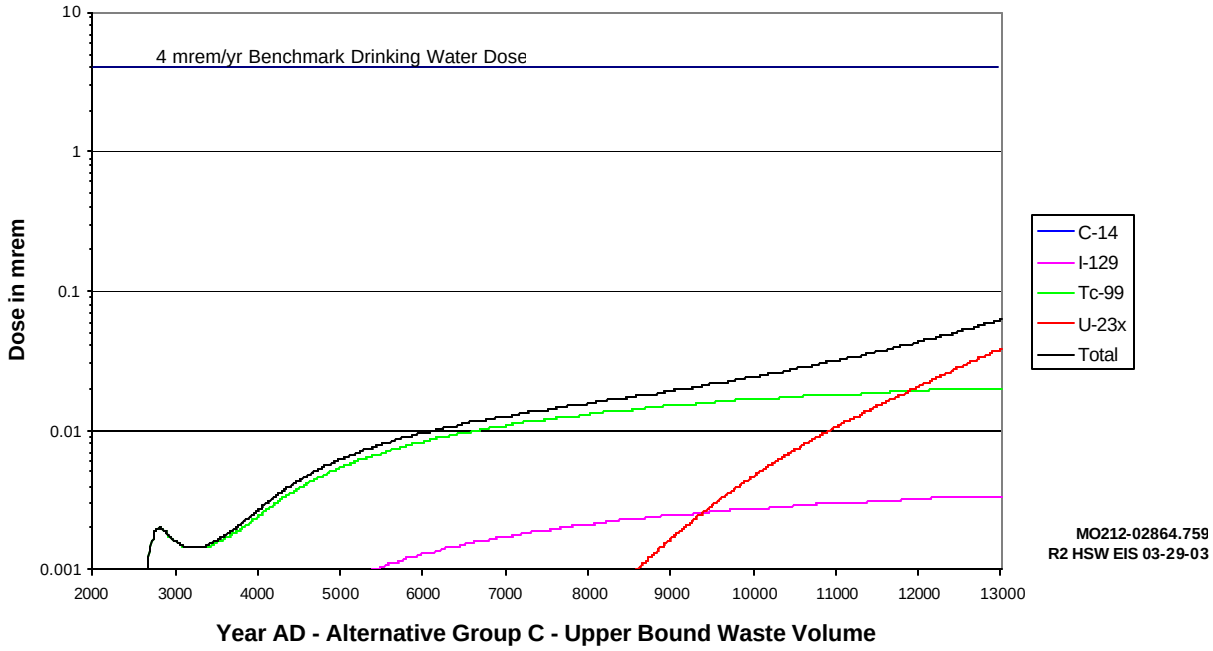
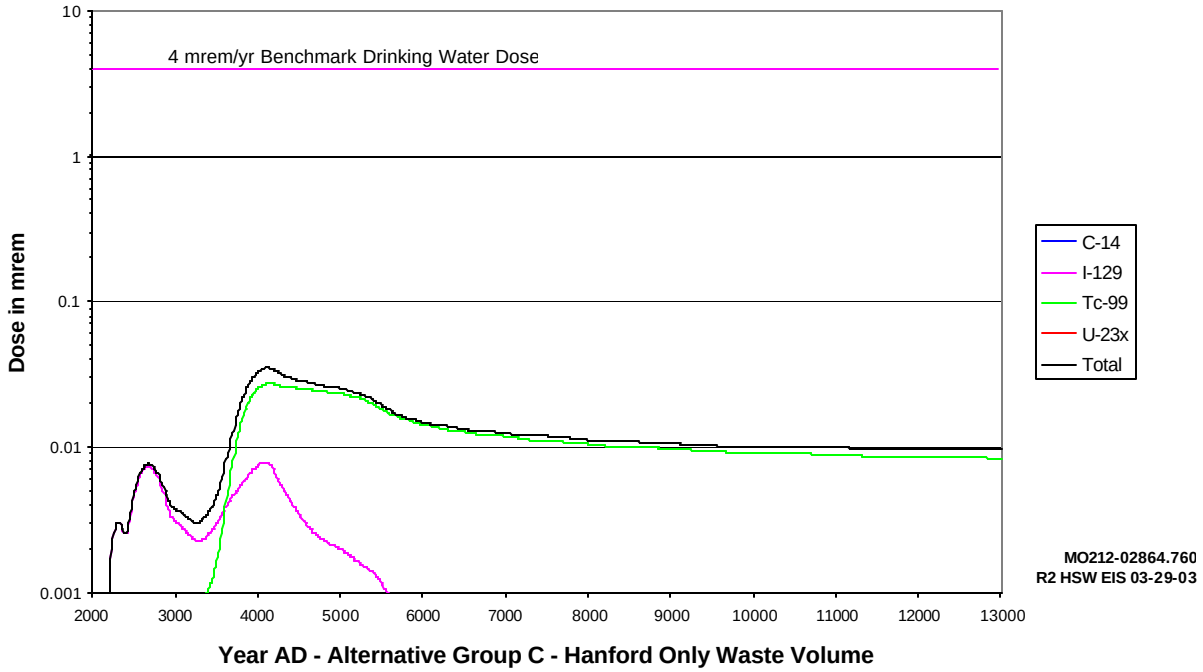


Figure F.10. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Southeast of 200 East Area, Alternative Group C



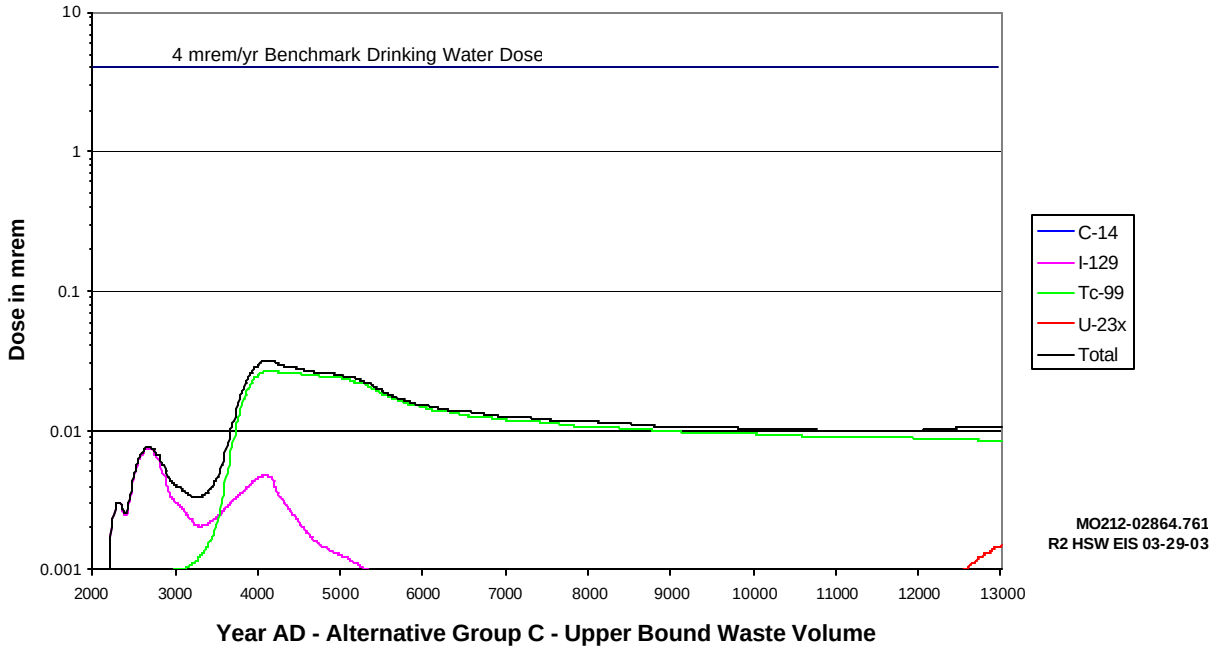
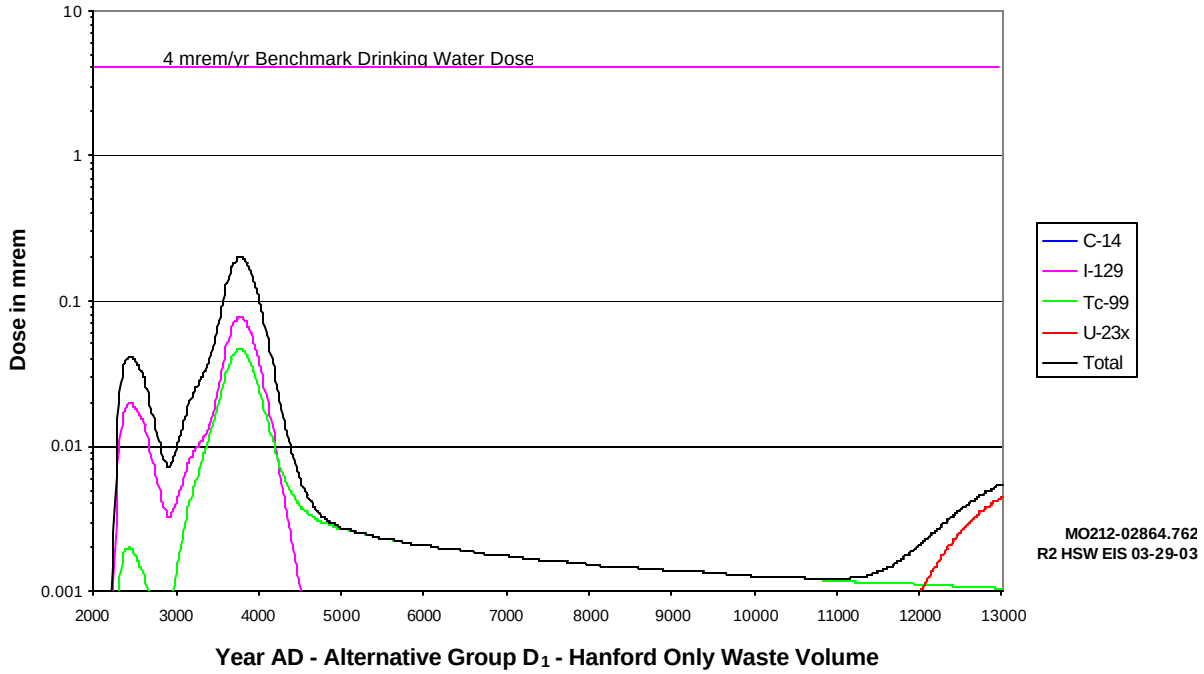


Figure F.11. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group C



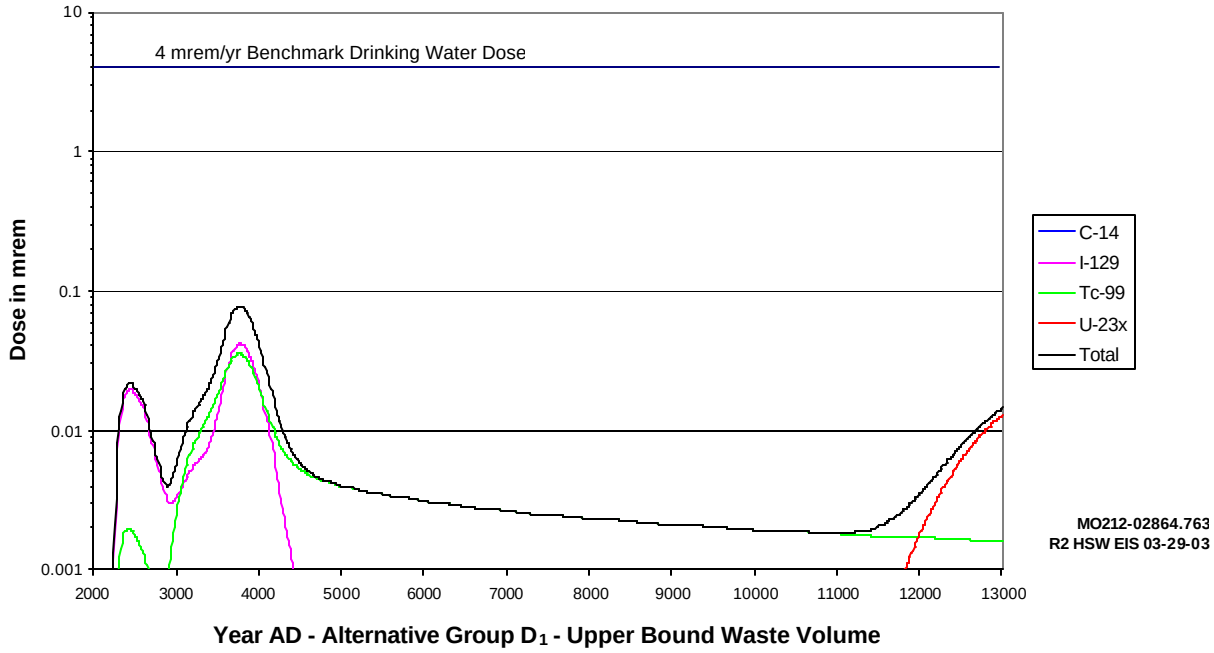
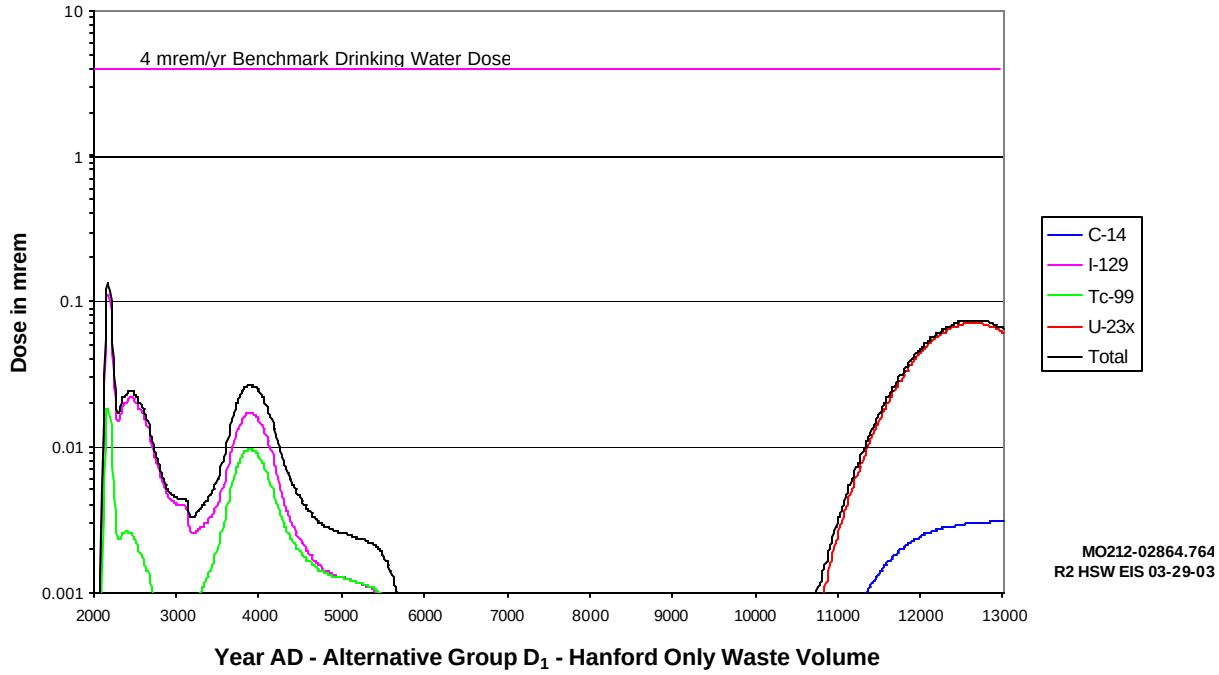


Figure F.12. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group D_1



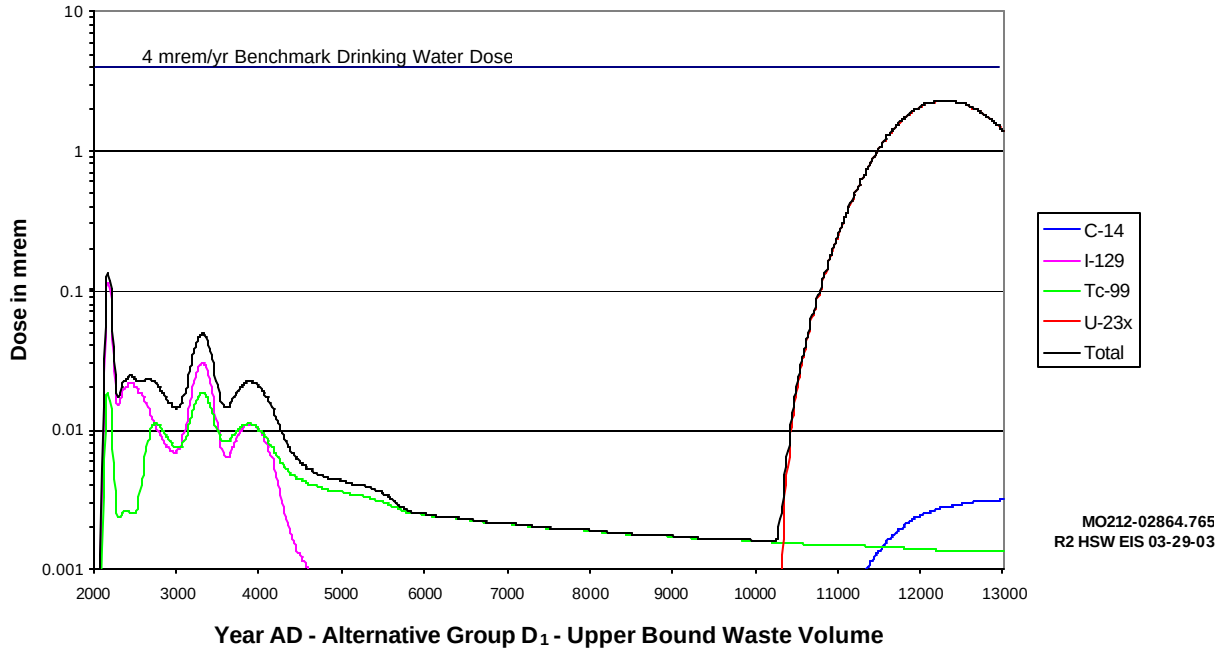
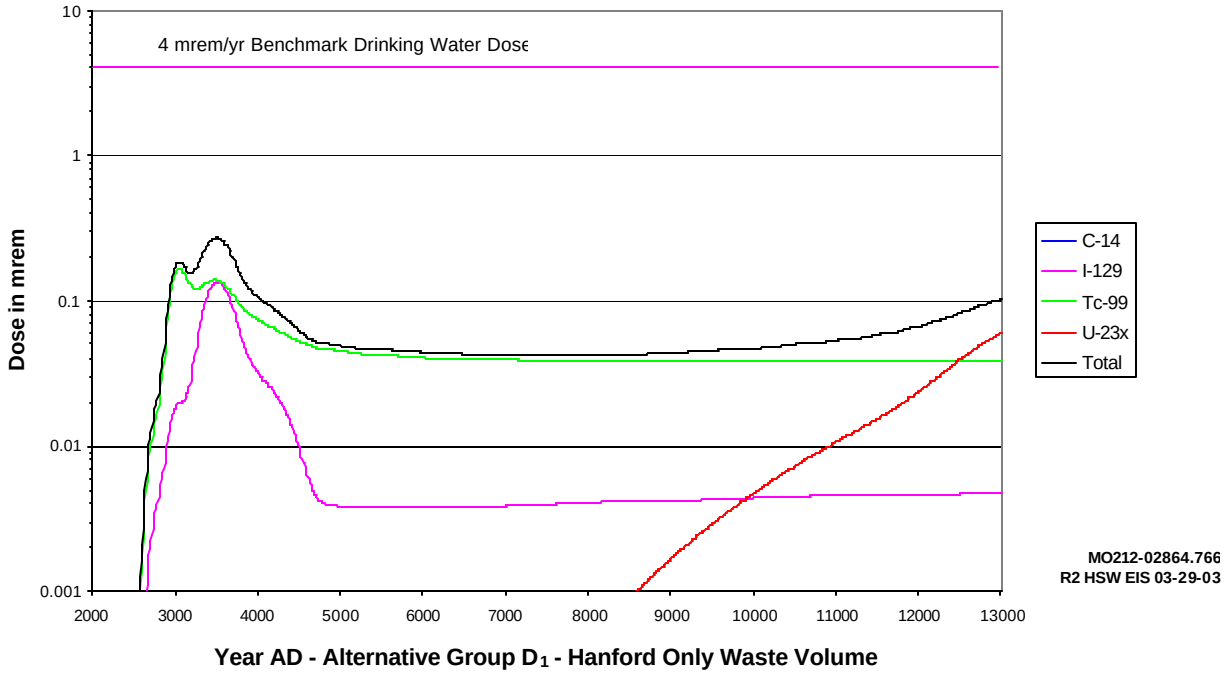


Figure F.13. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group D_1



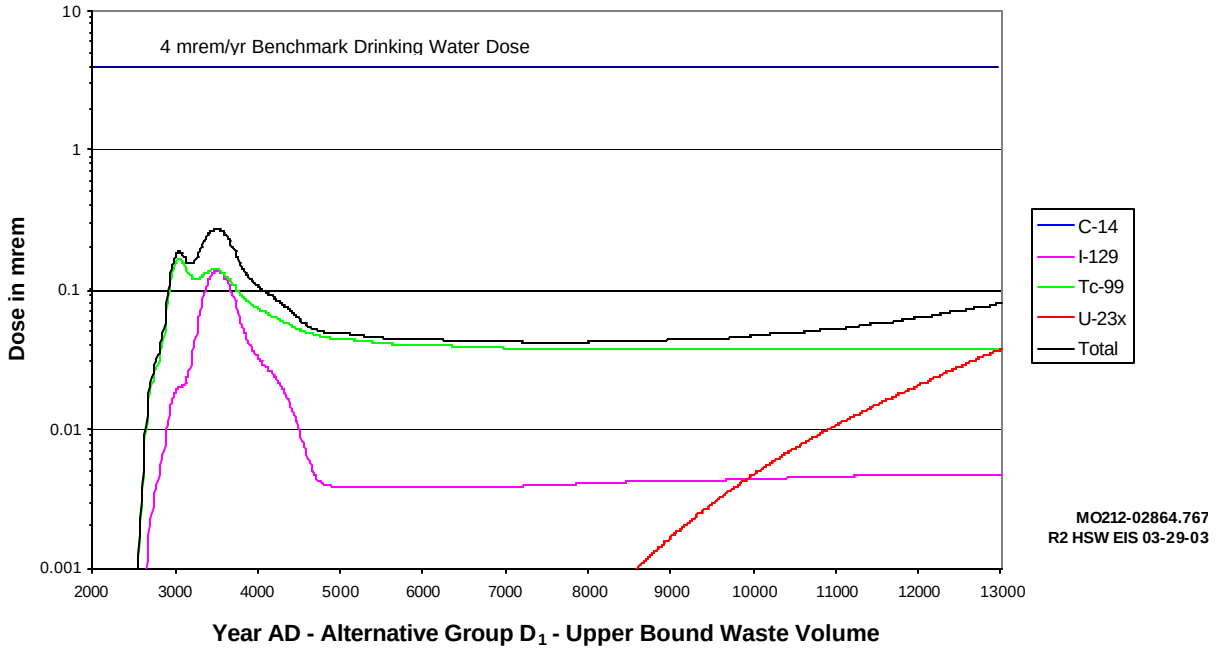
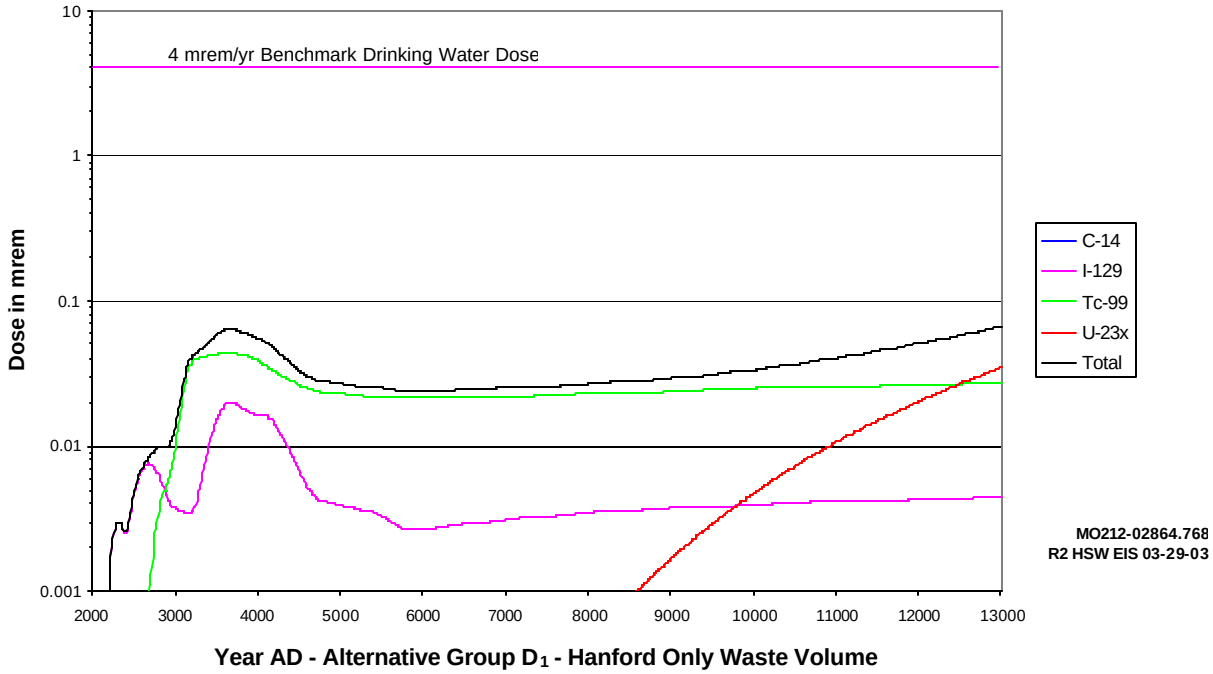


Figure F.14. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Southeast of 200 East Area, Alternative Group D_1



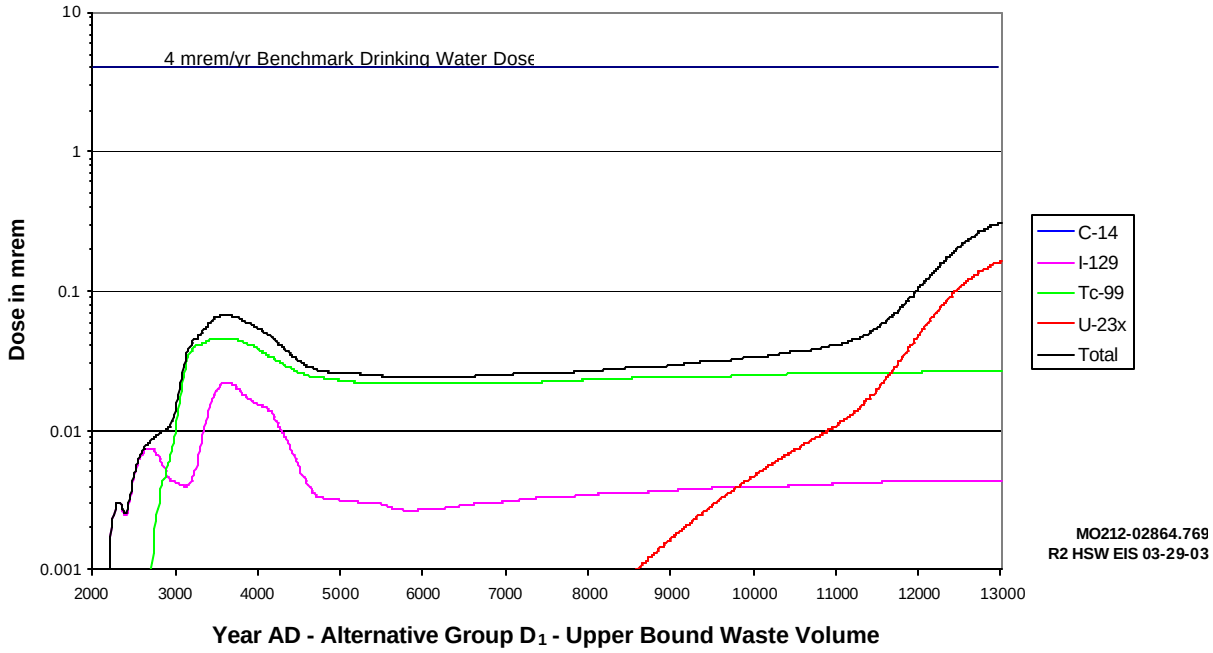
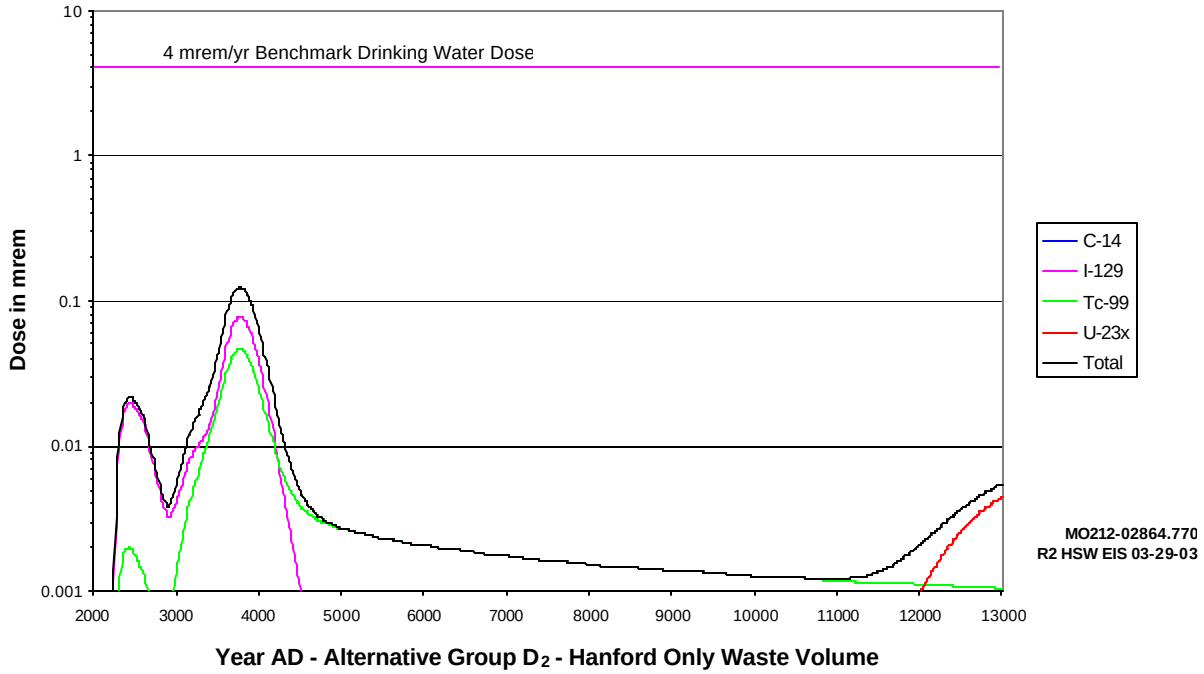


Figure F.15. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group D_1



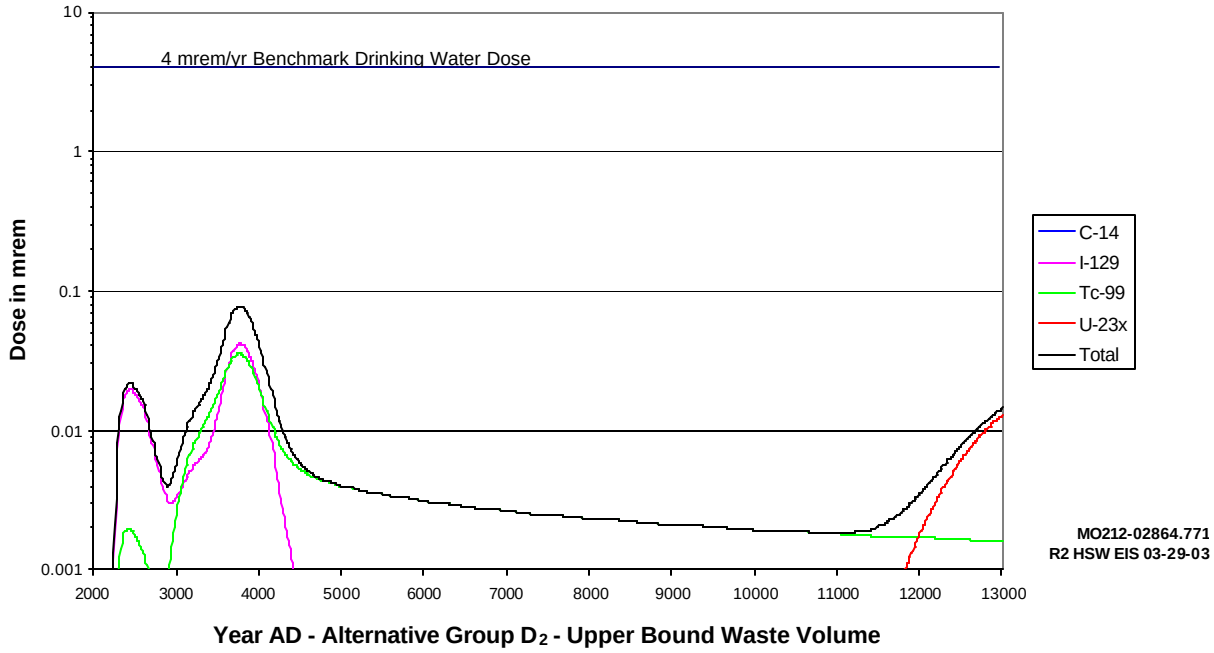
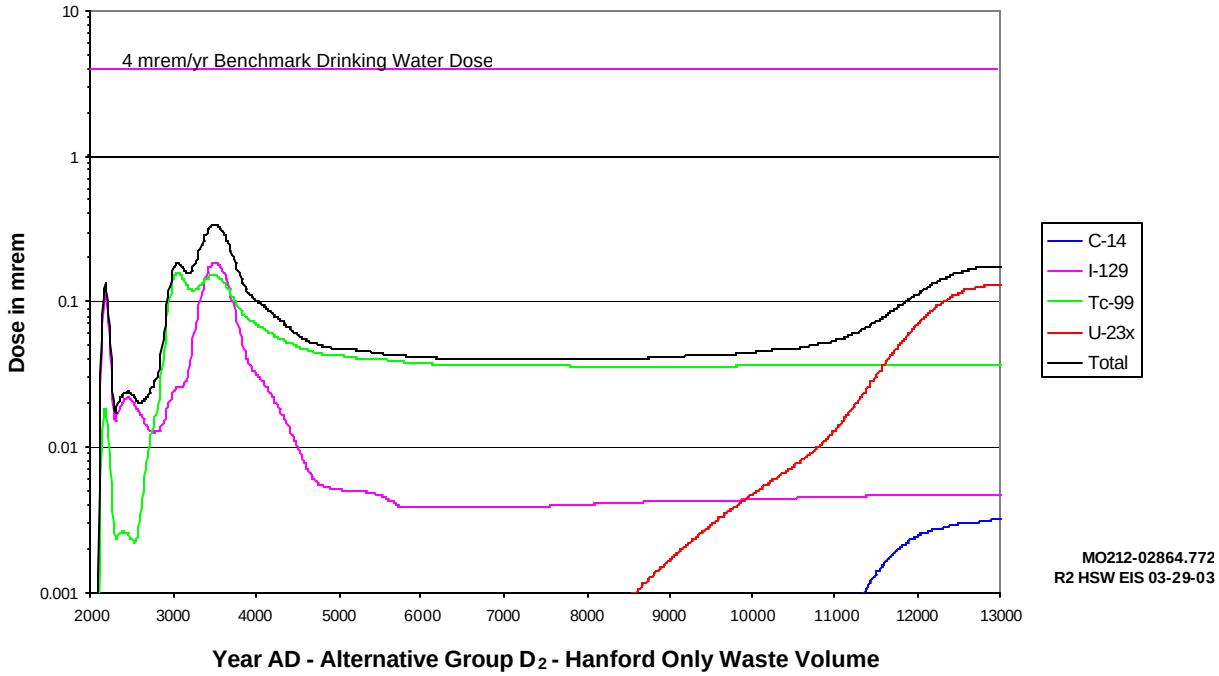


Figure F.16. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group D_2



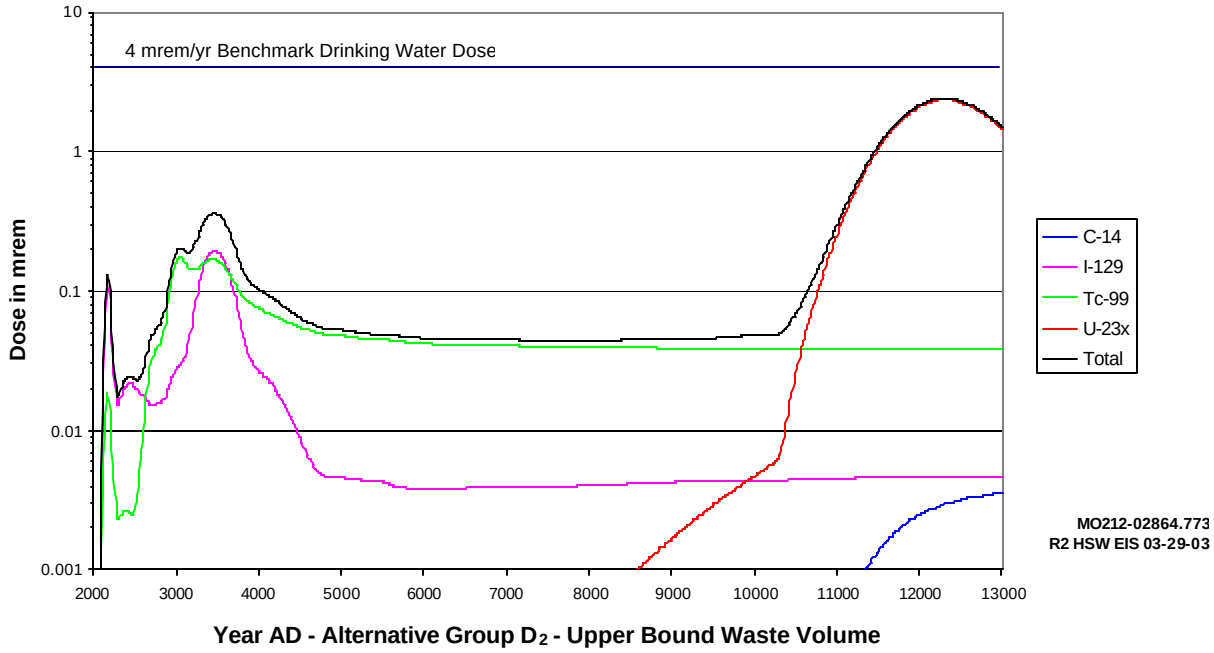
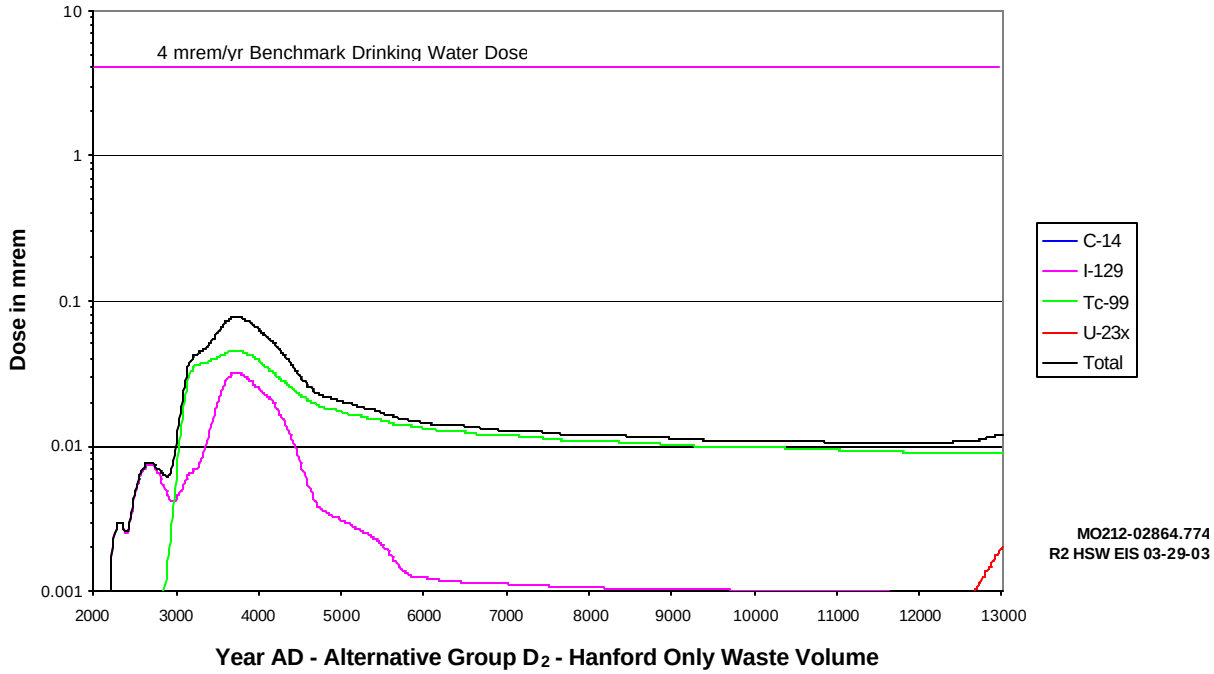


Figure F.17. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group D_2



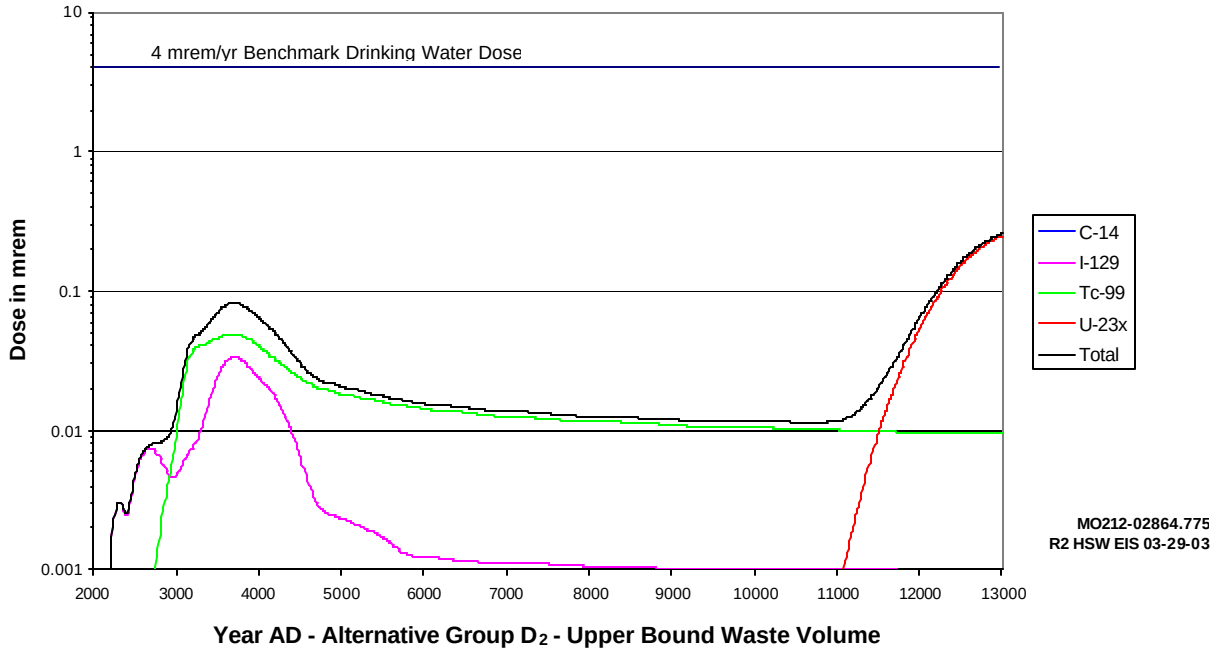
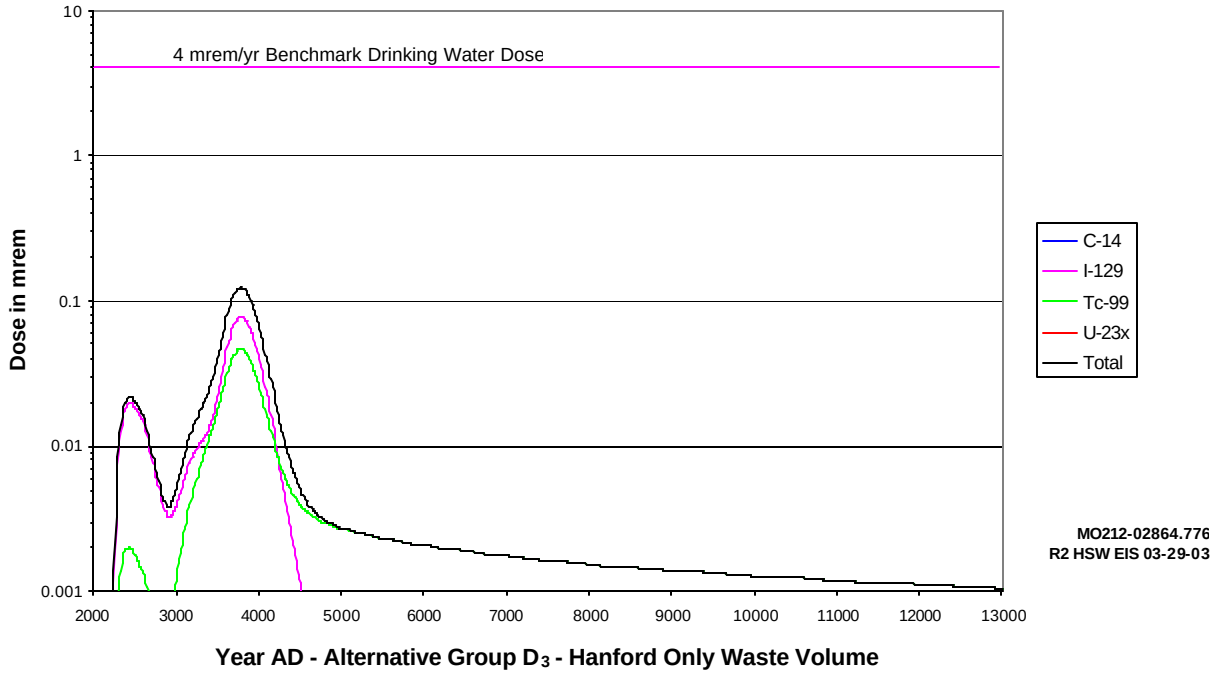


Figure F.18. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group D_2



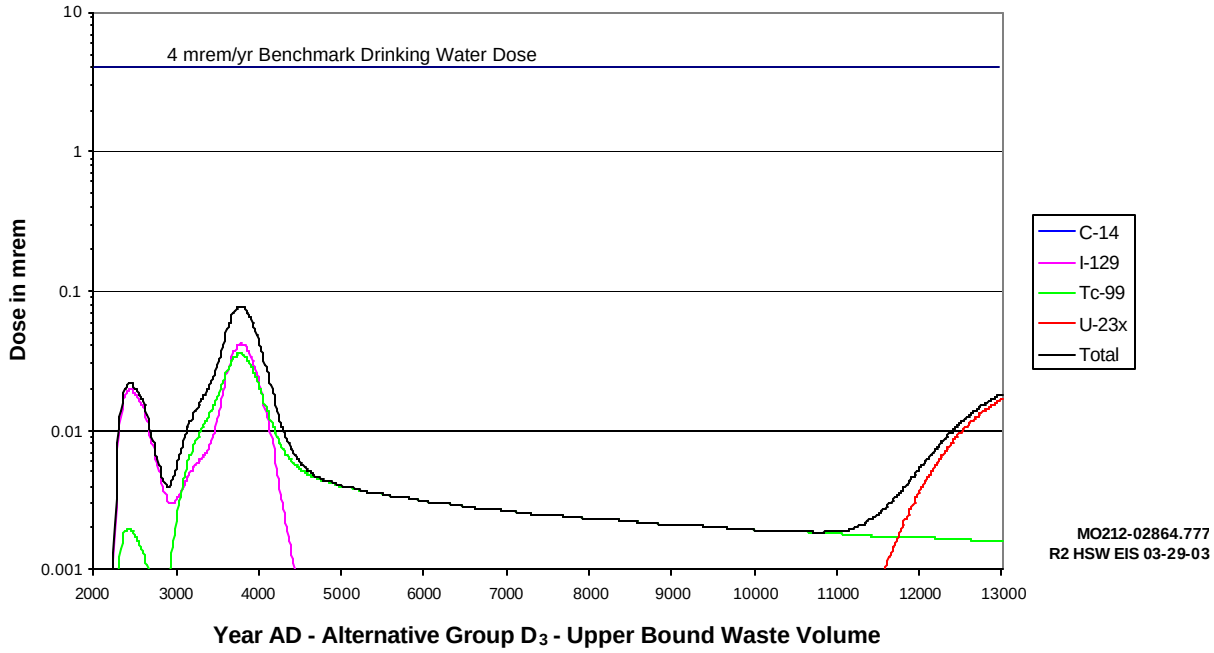
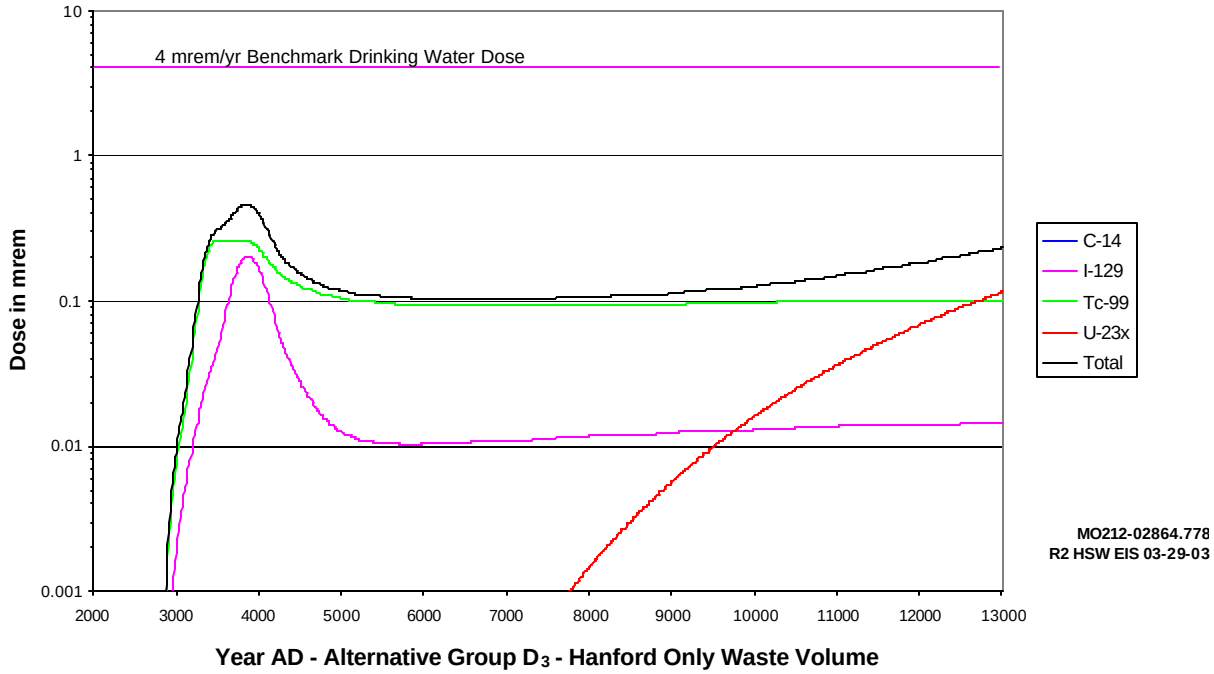


Figure F.19. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group D_3



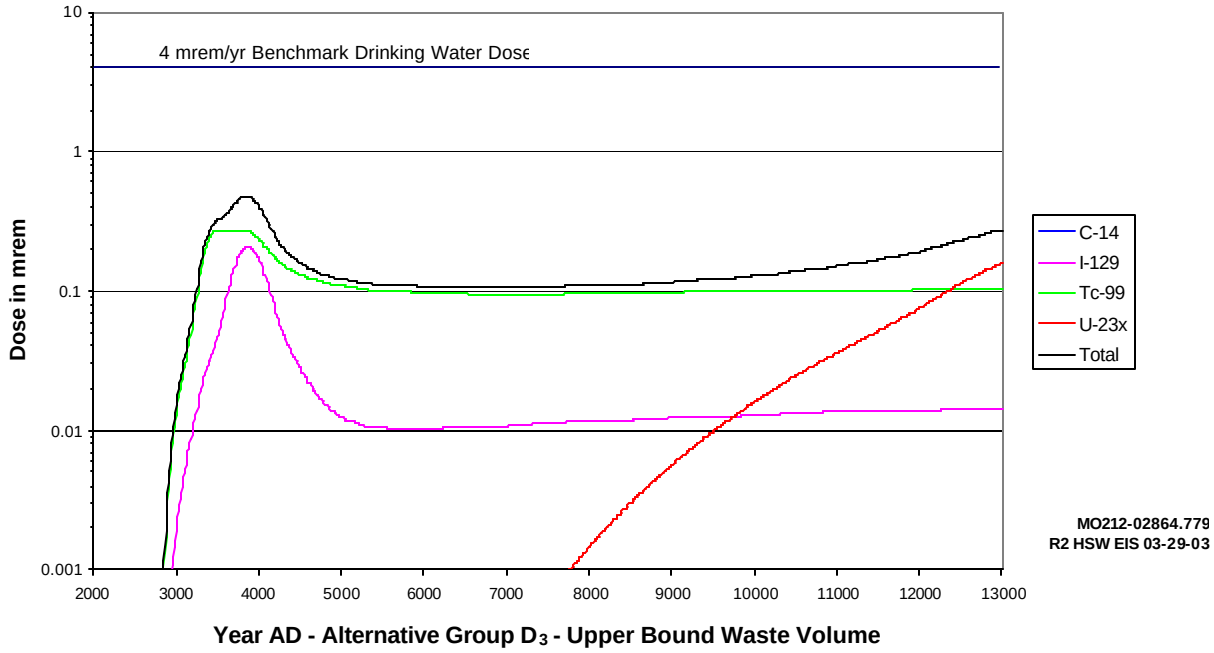
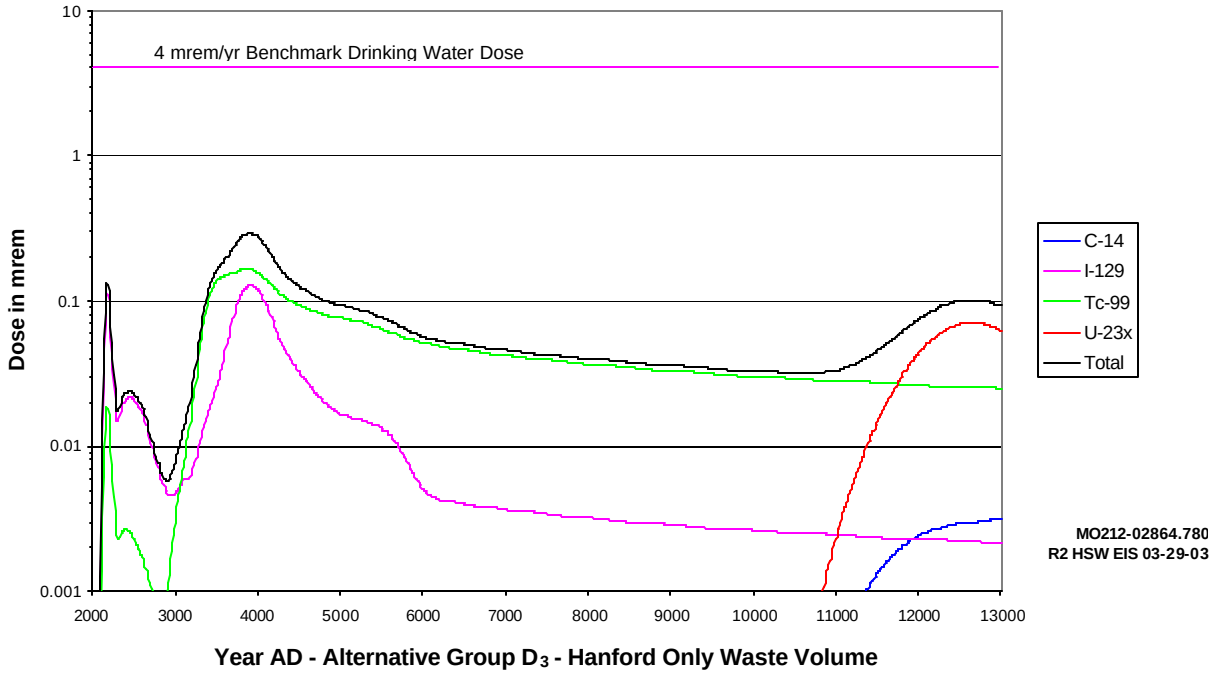


Figure F.20. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from ERDF, Alternative Group D_3



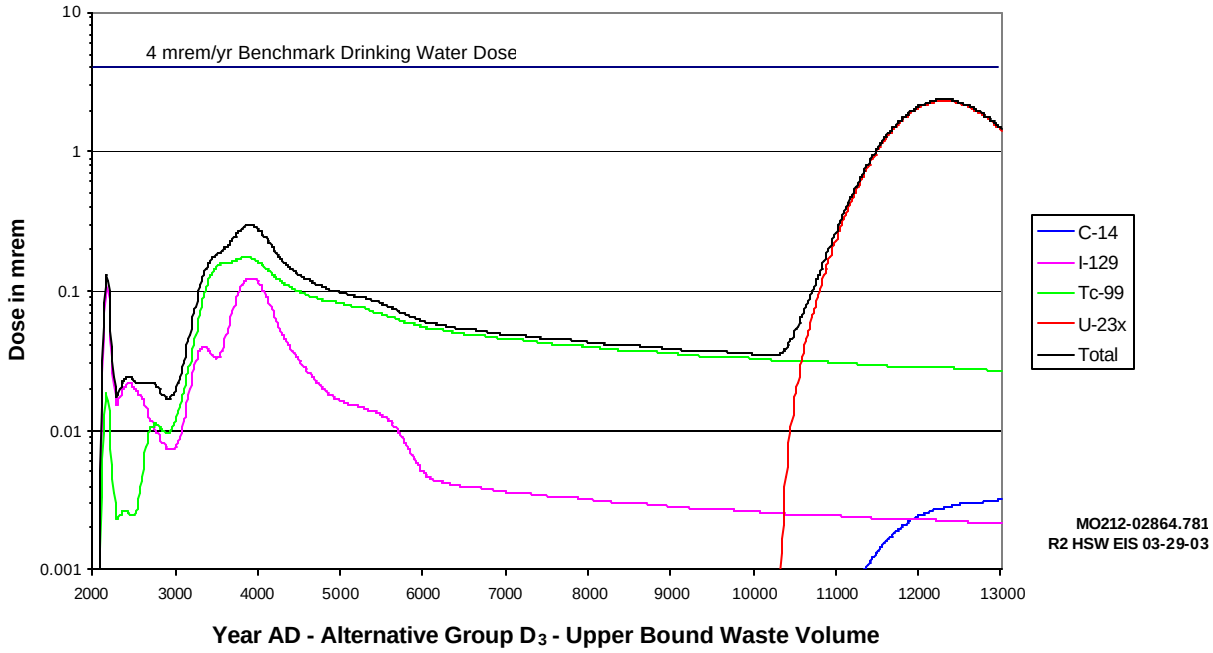
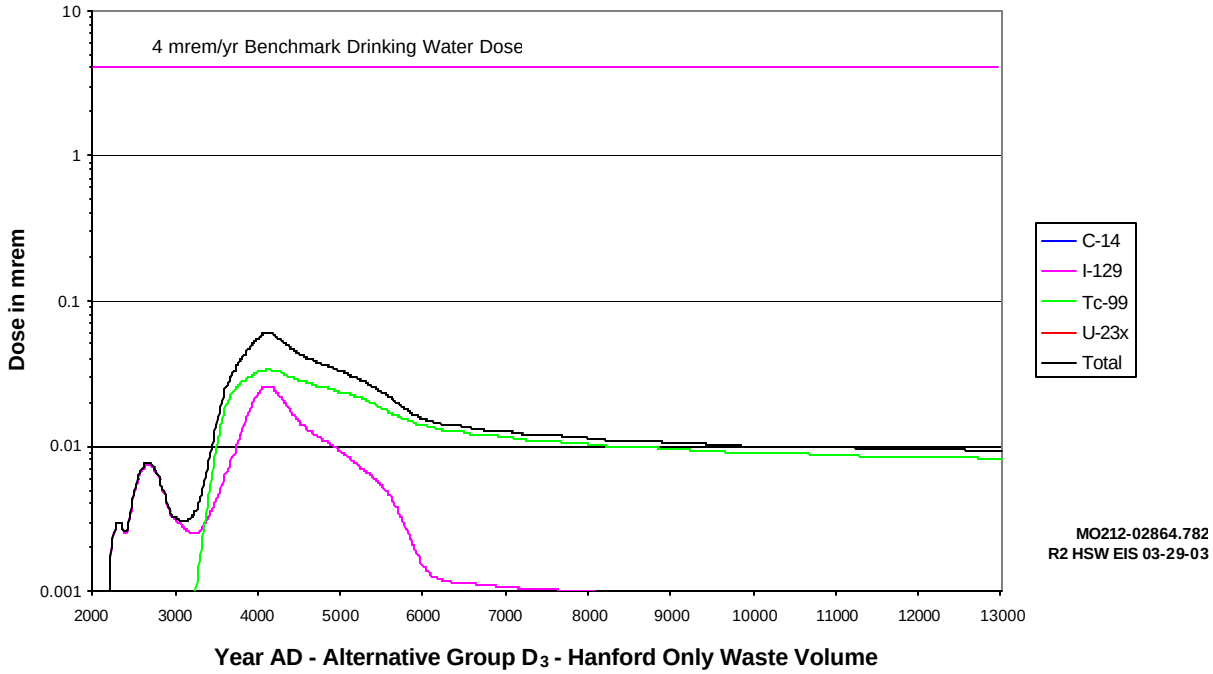


Figure F.21. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group D_3



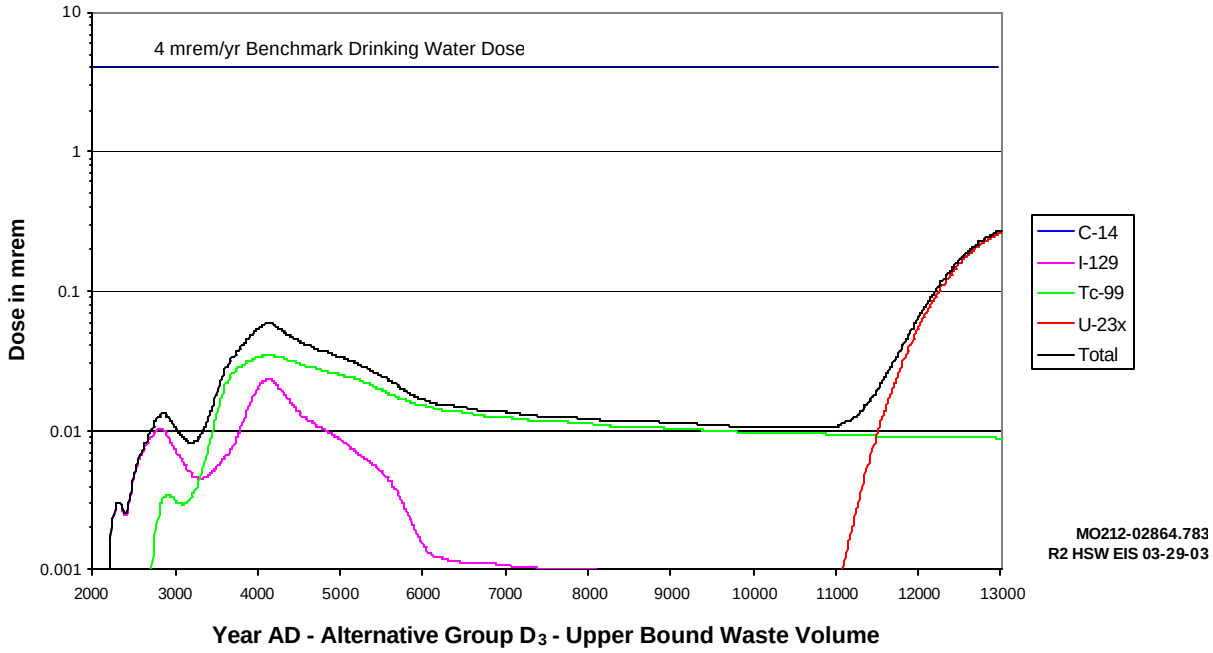
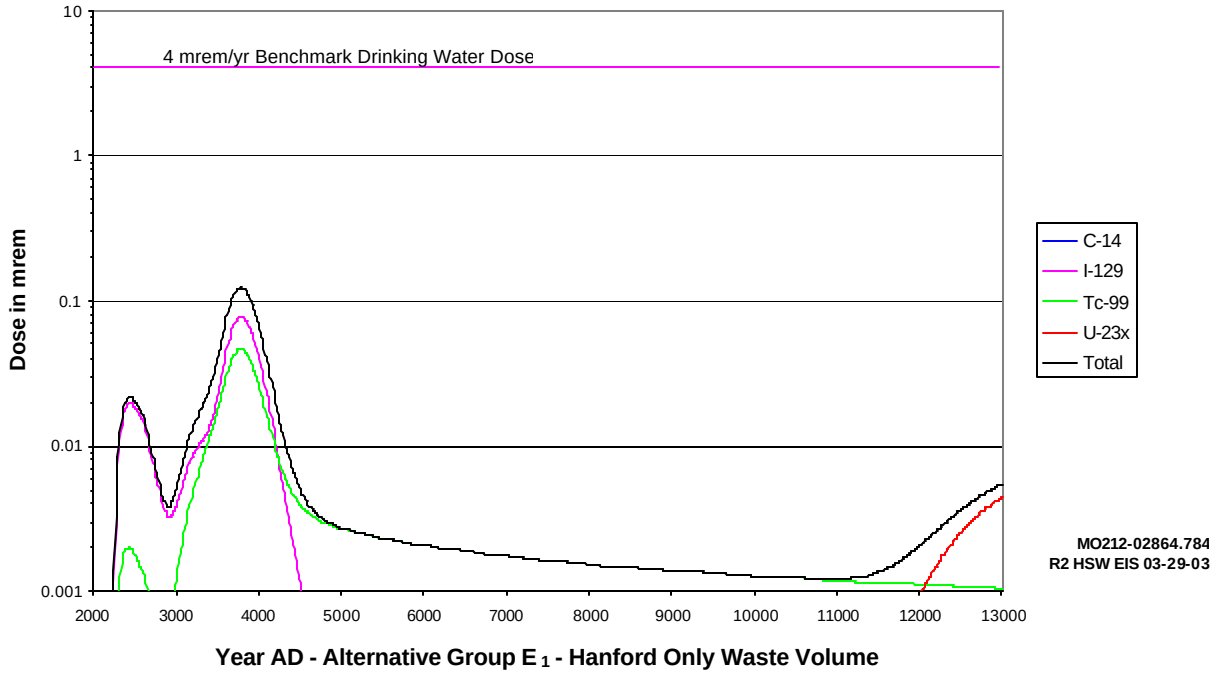


Figure F.22. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group D_3



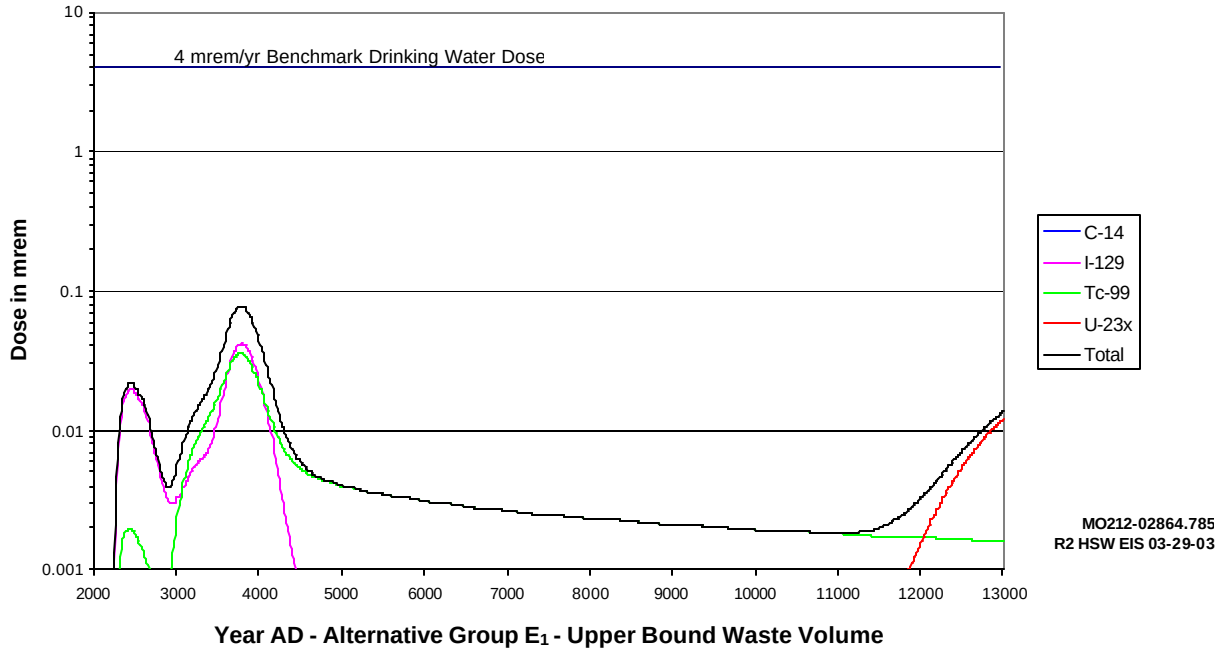
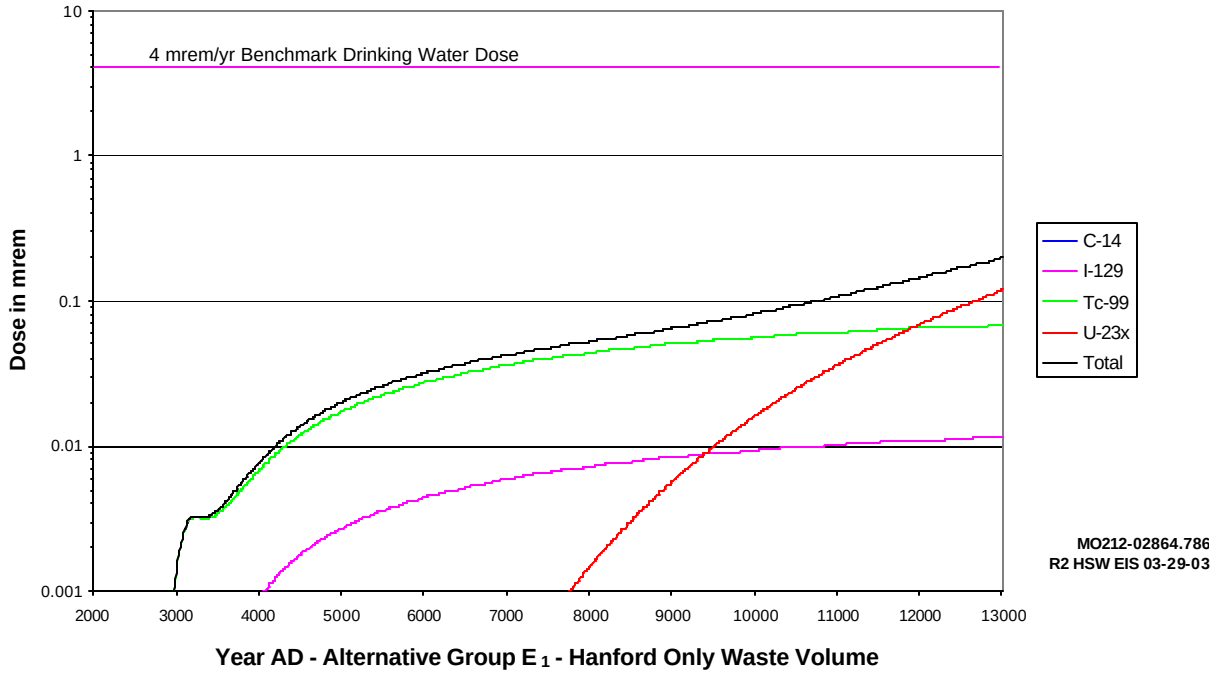


Figure F.23. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group E_1



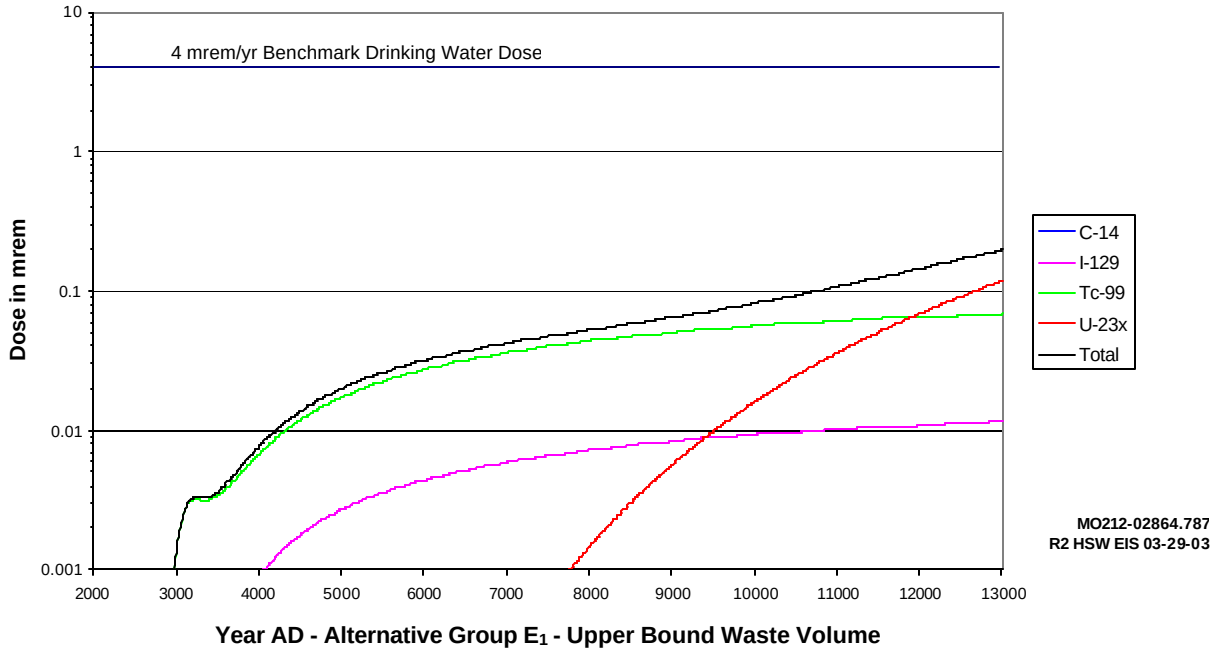
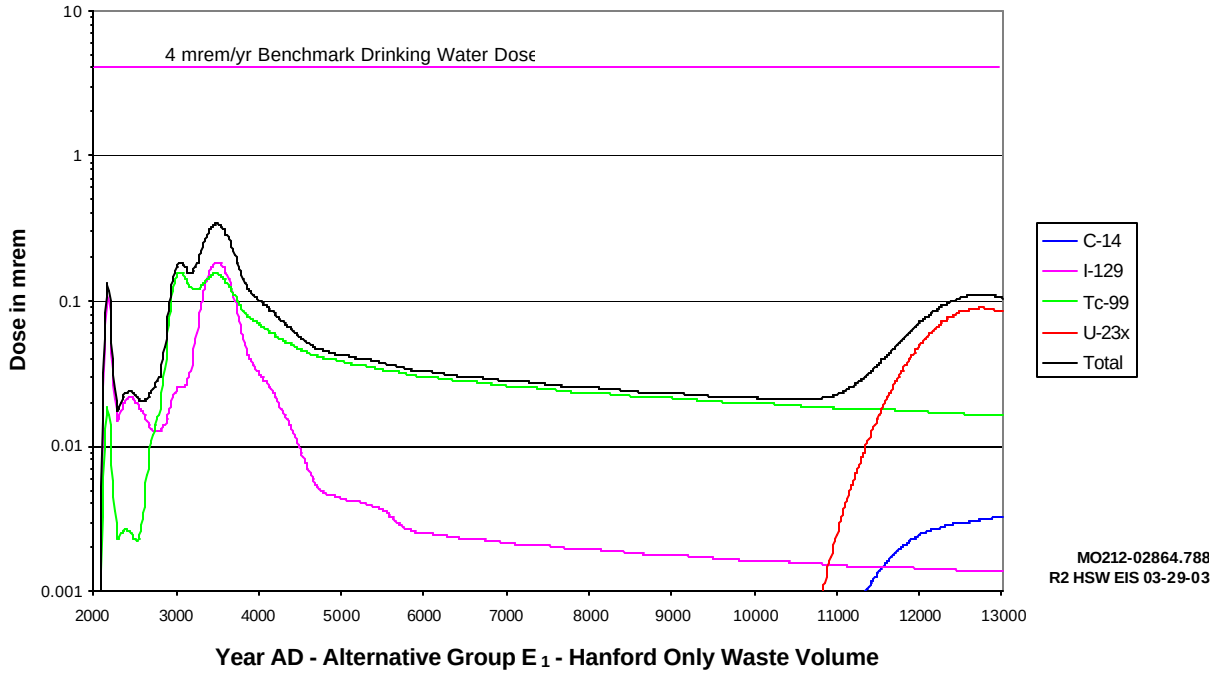


Figure F.24. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from ERDF, Alternative Group E_1



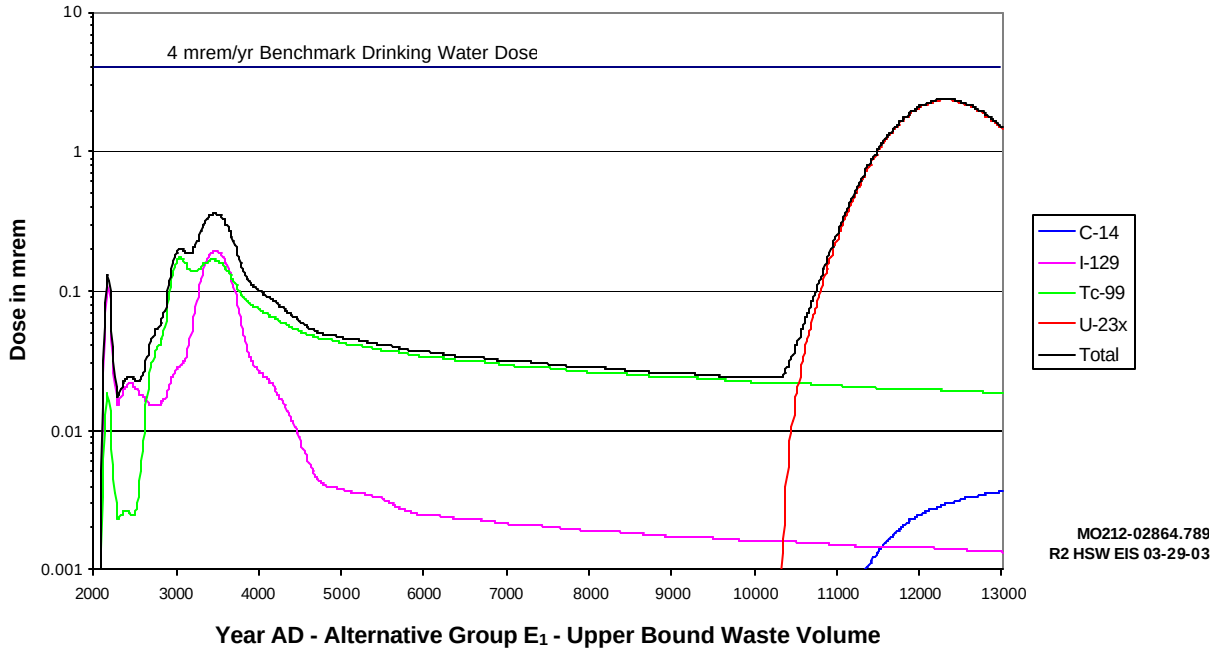
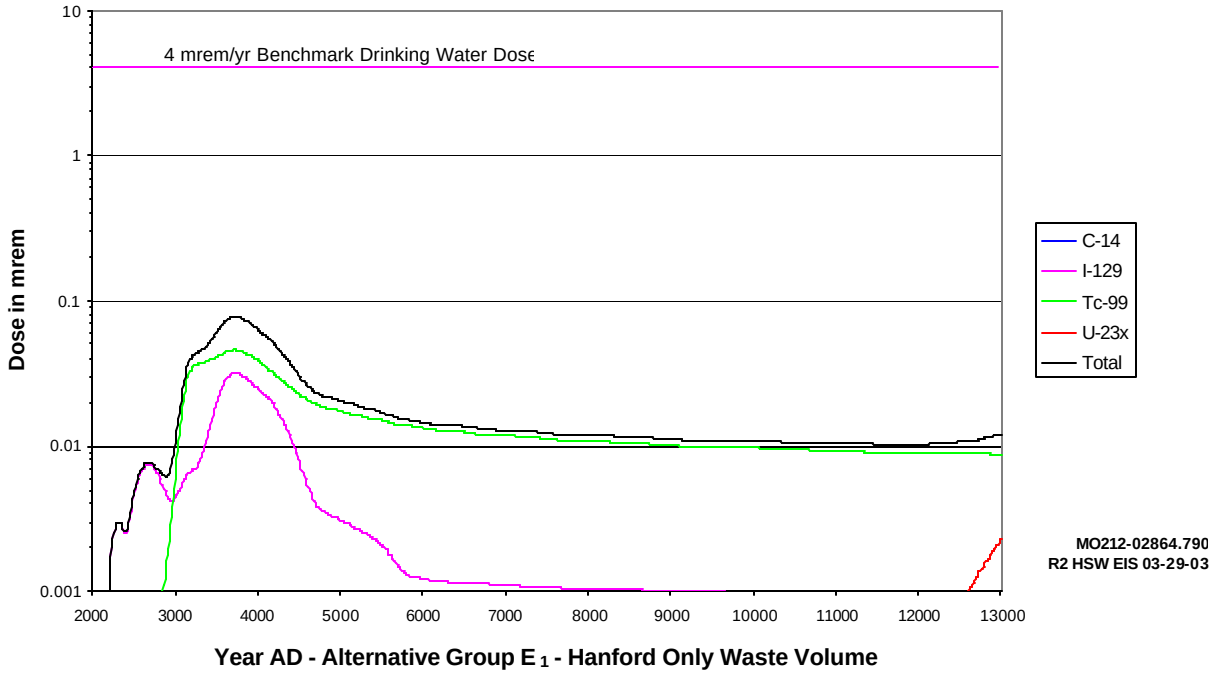


Figure F.25. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group E_1



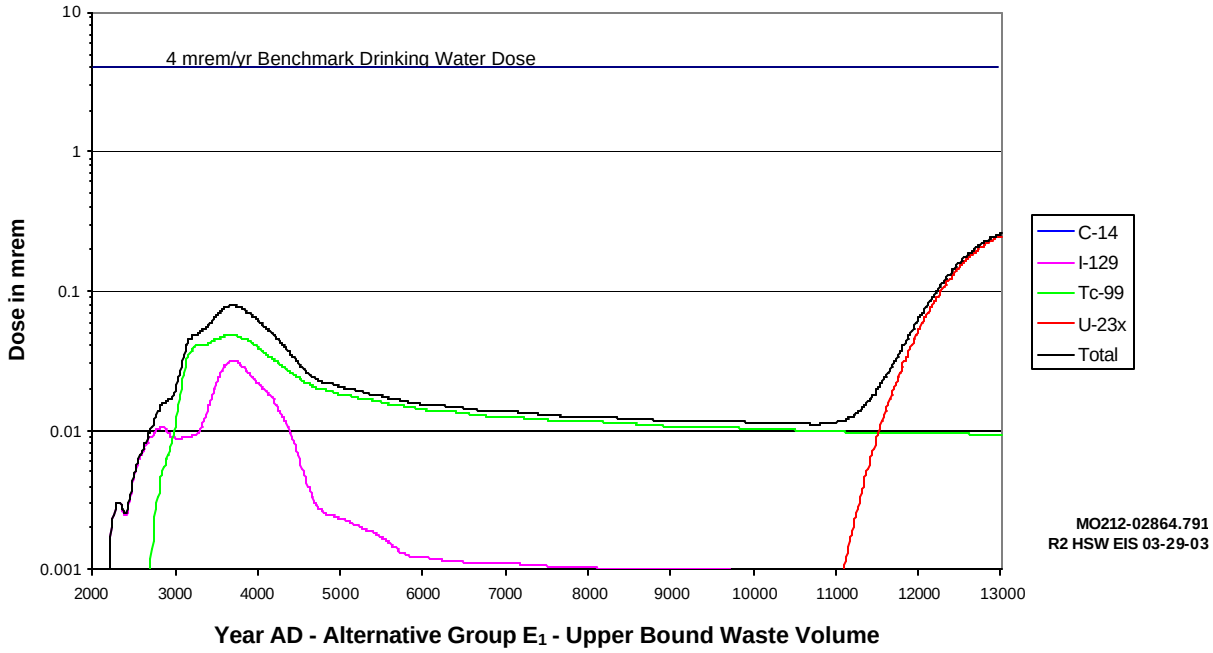
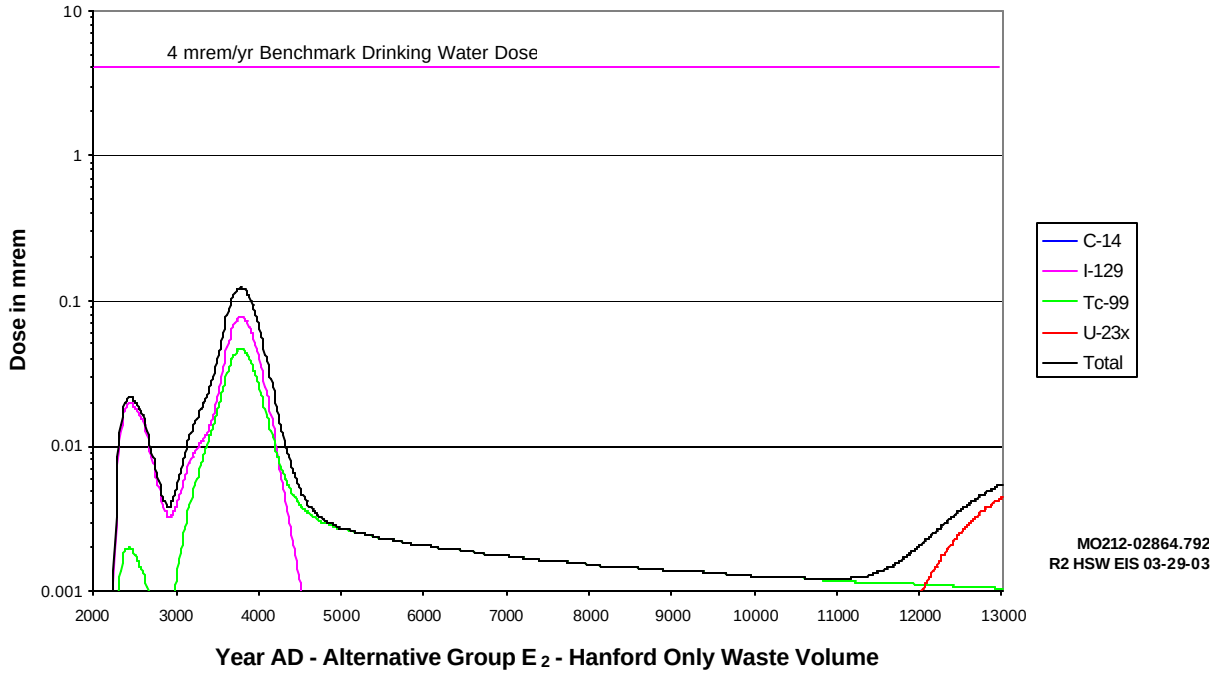


Figure F.26. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group E_1



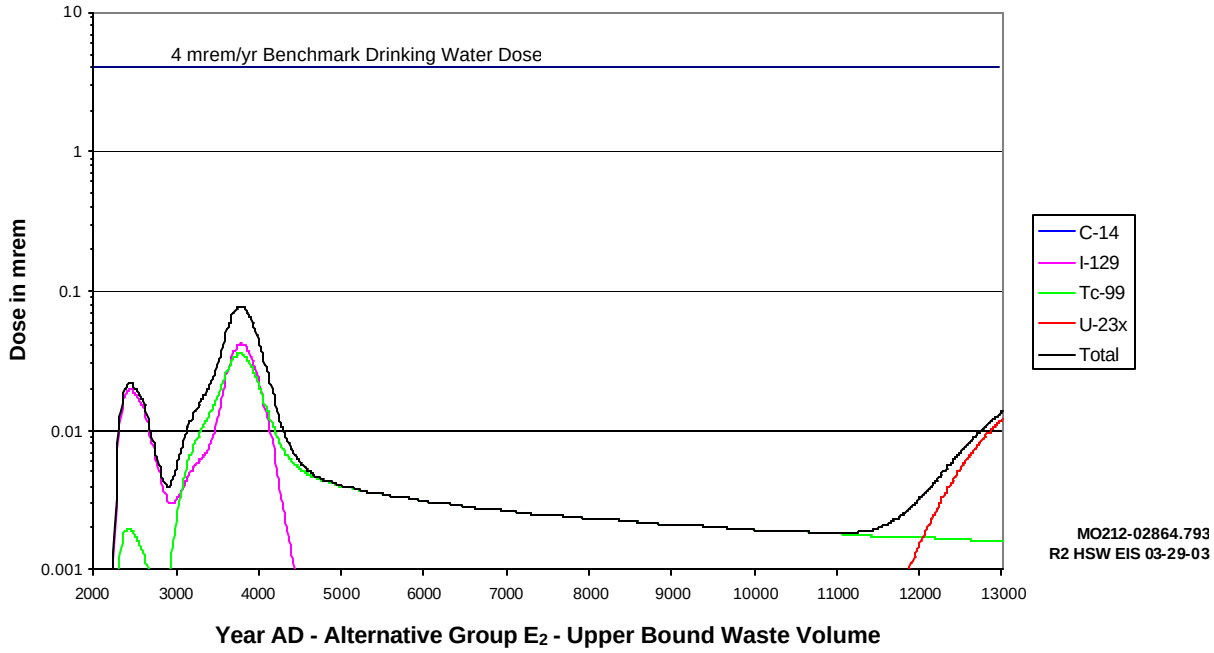
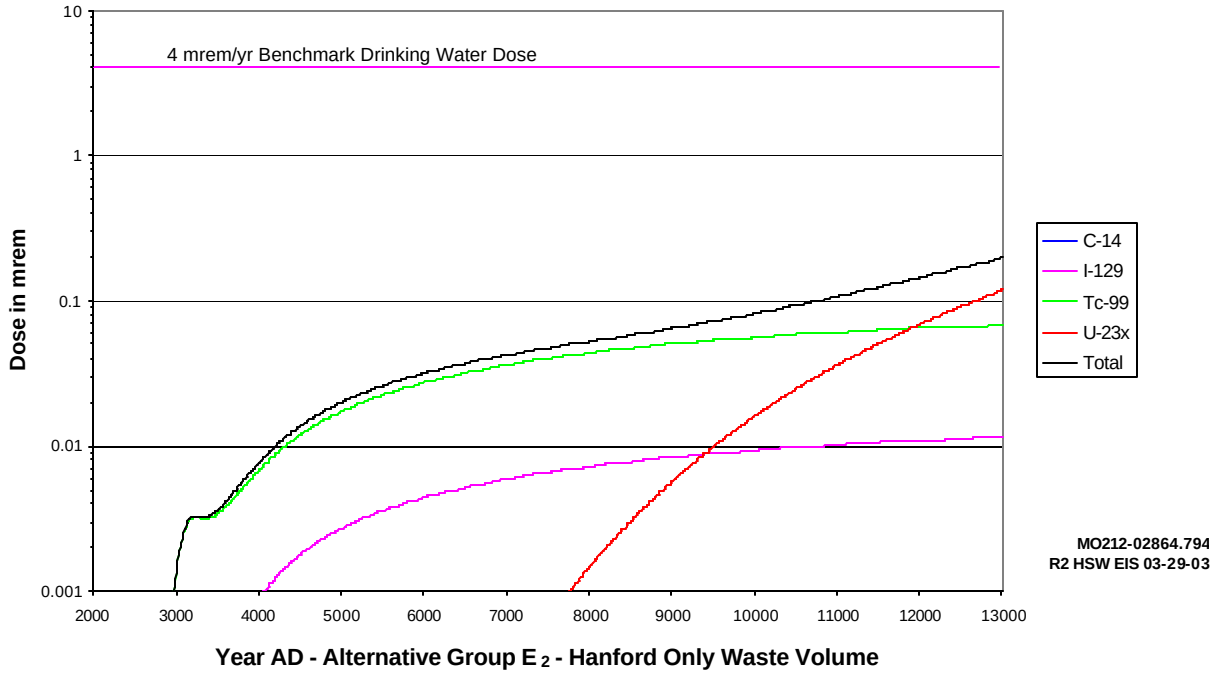


Figure F.27. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group E_2



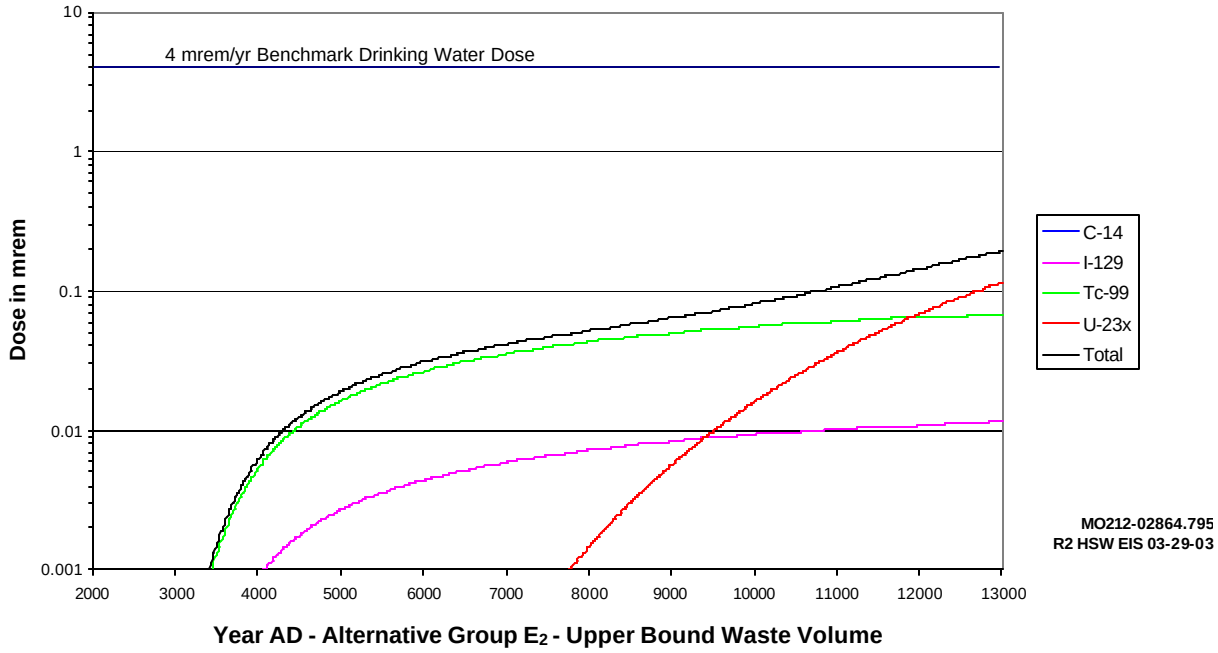
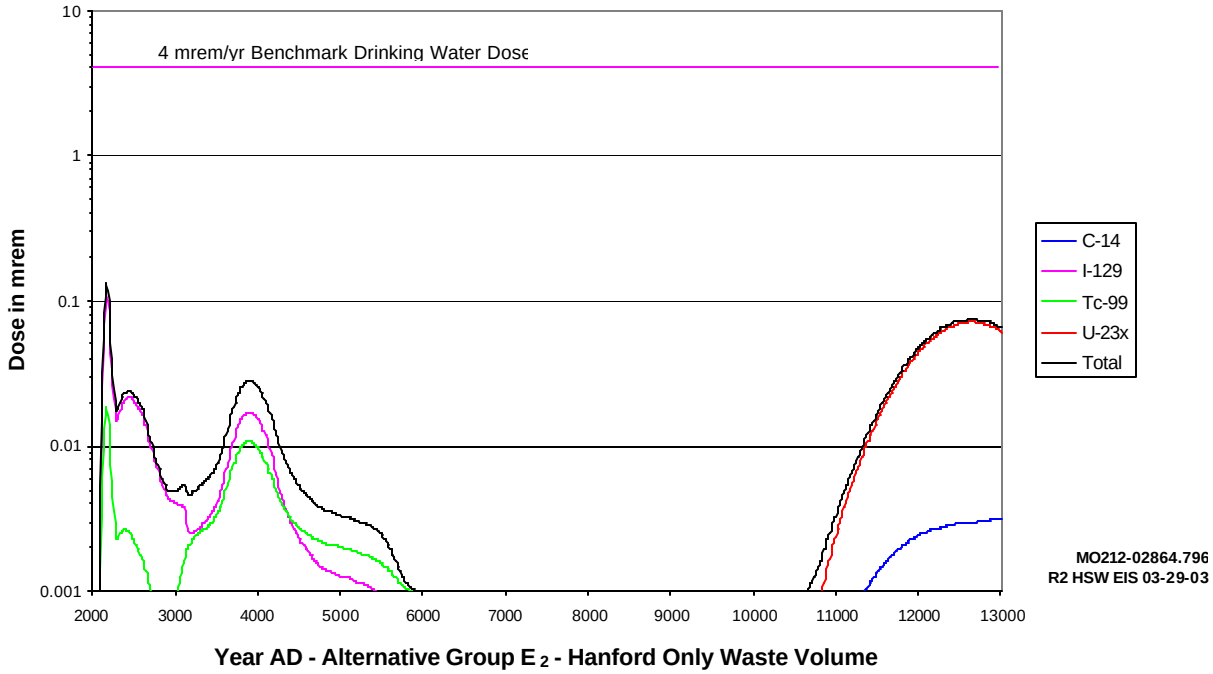


Figure F.28. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from ERDF, Alternative Group E_2



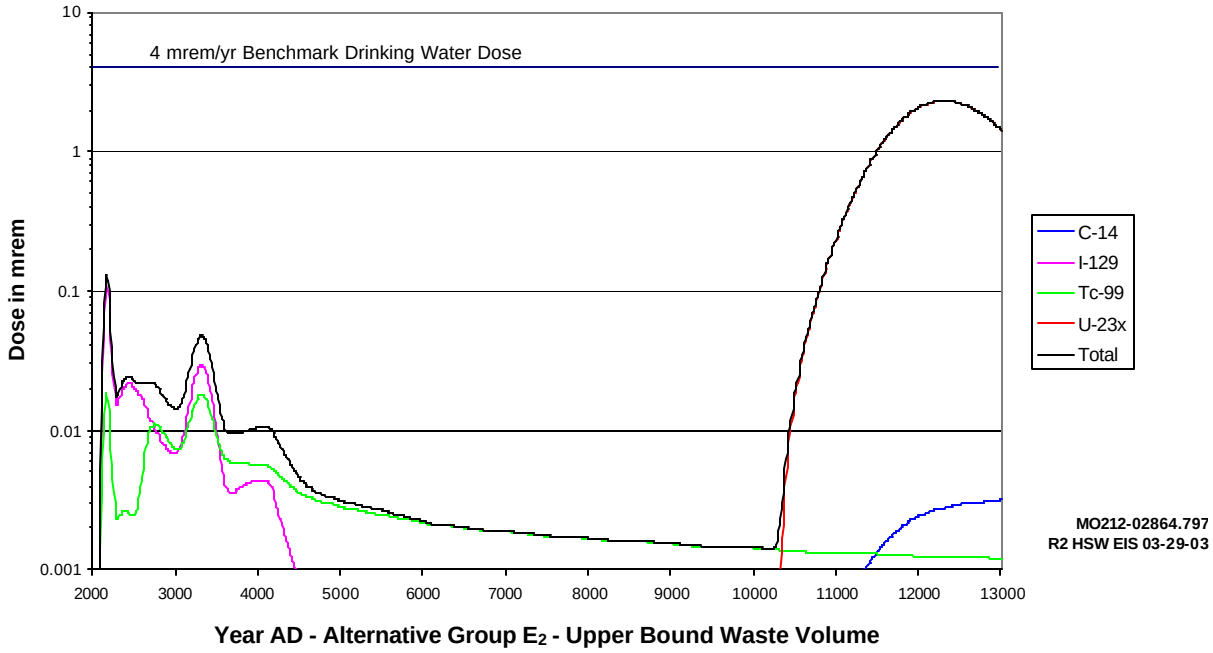
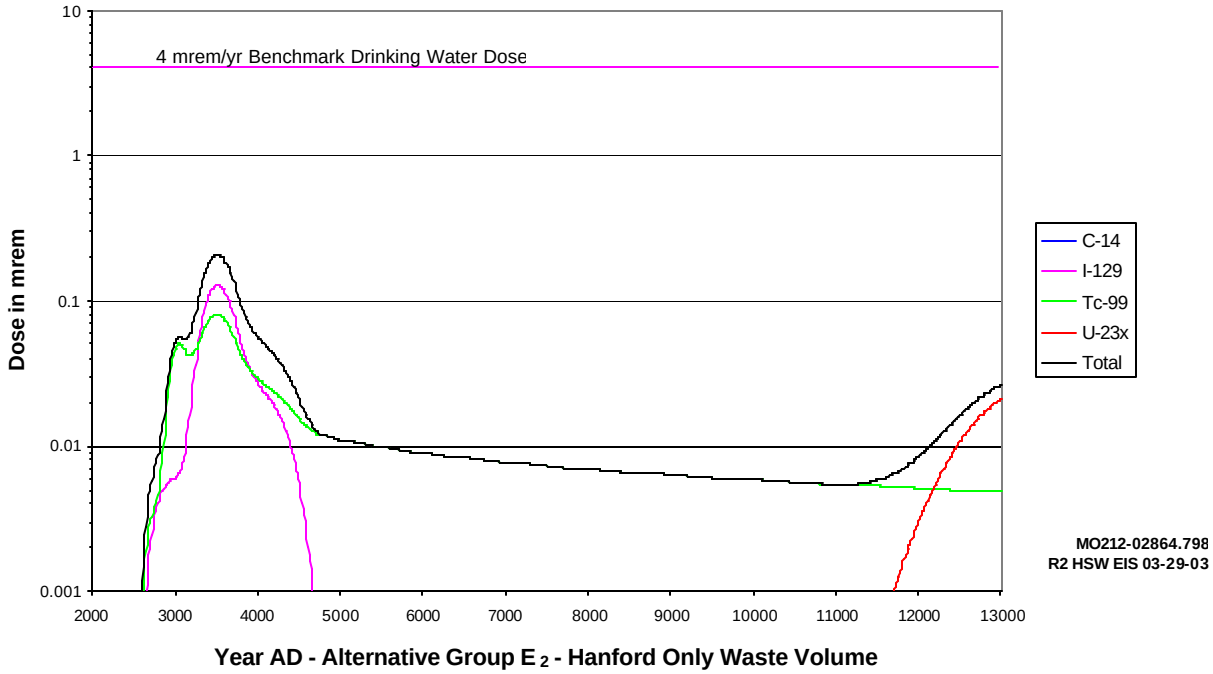


Figure F.29. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group E_2



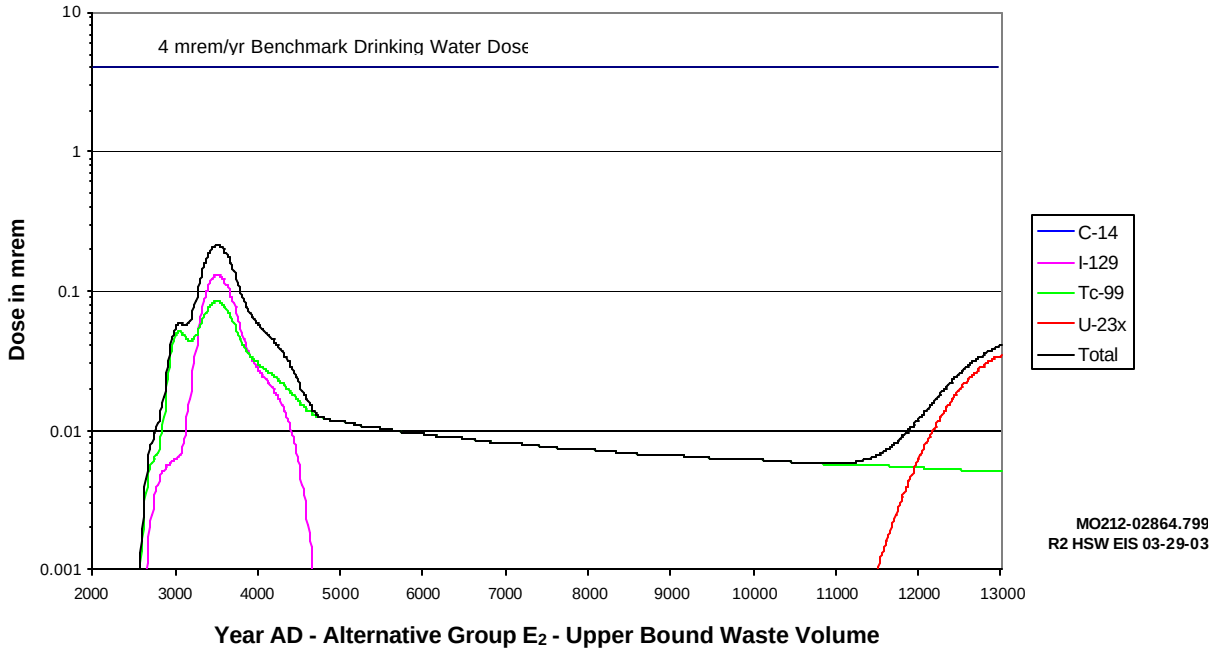
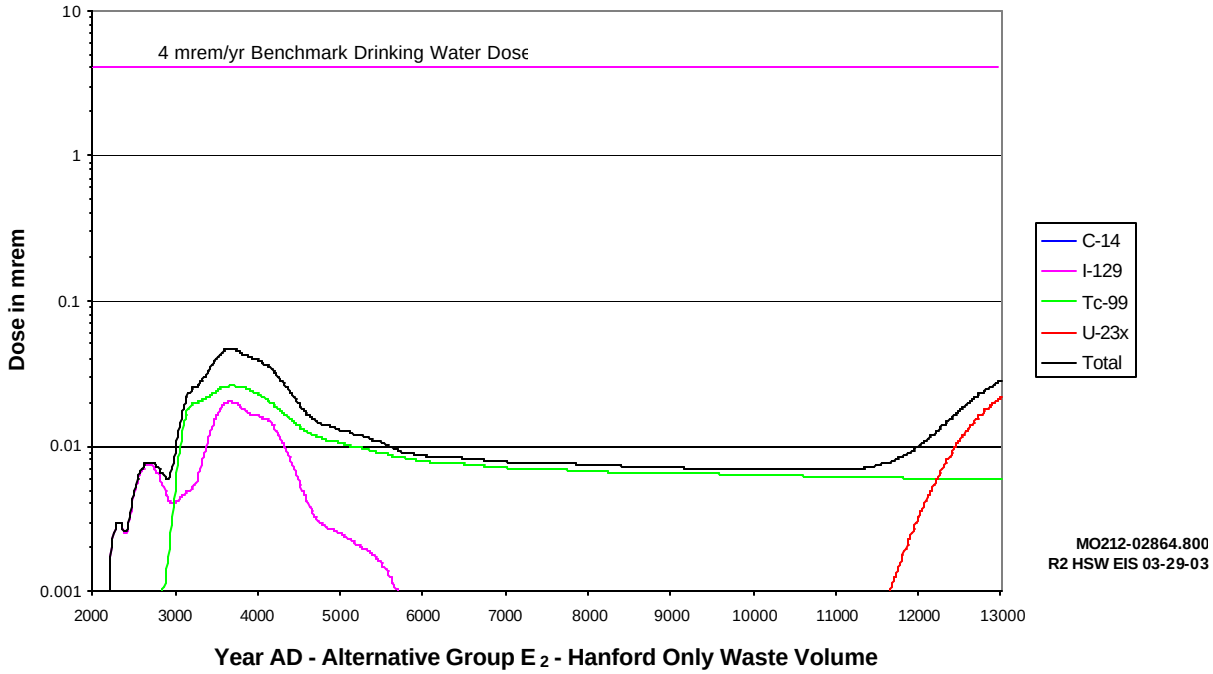


Figure F.30. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Southeast of 200 East Area, Alternative Group E_2



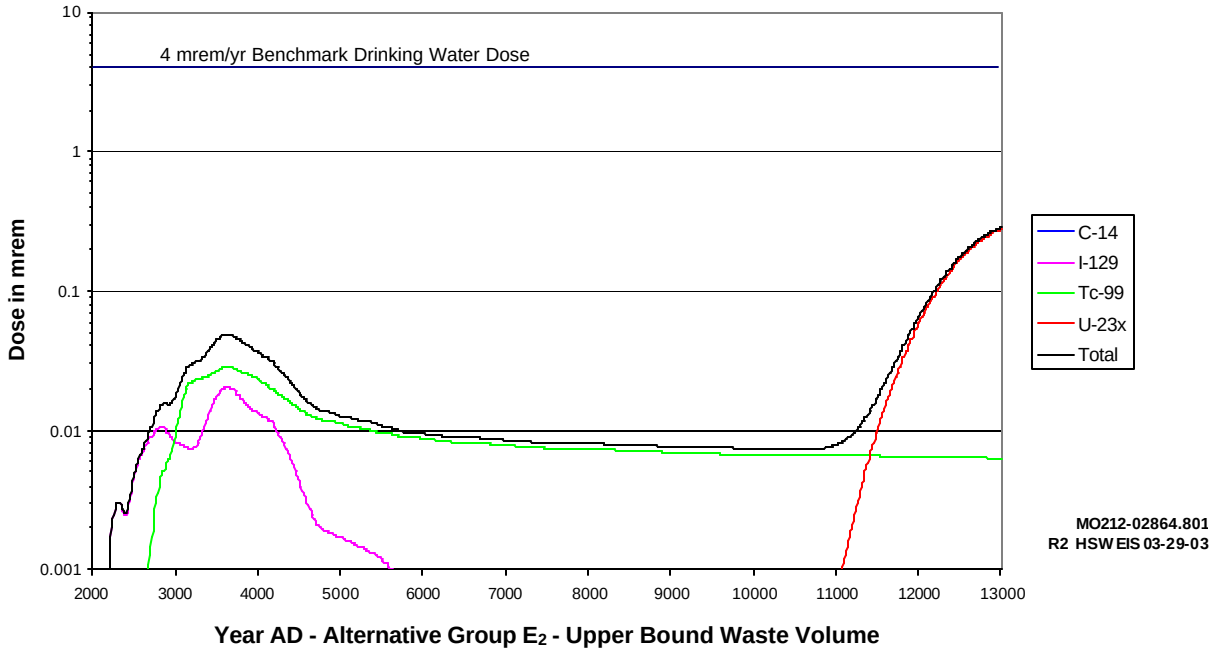
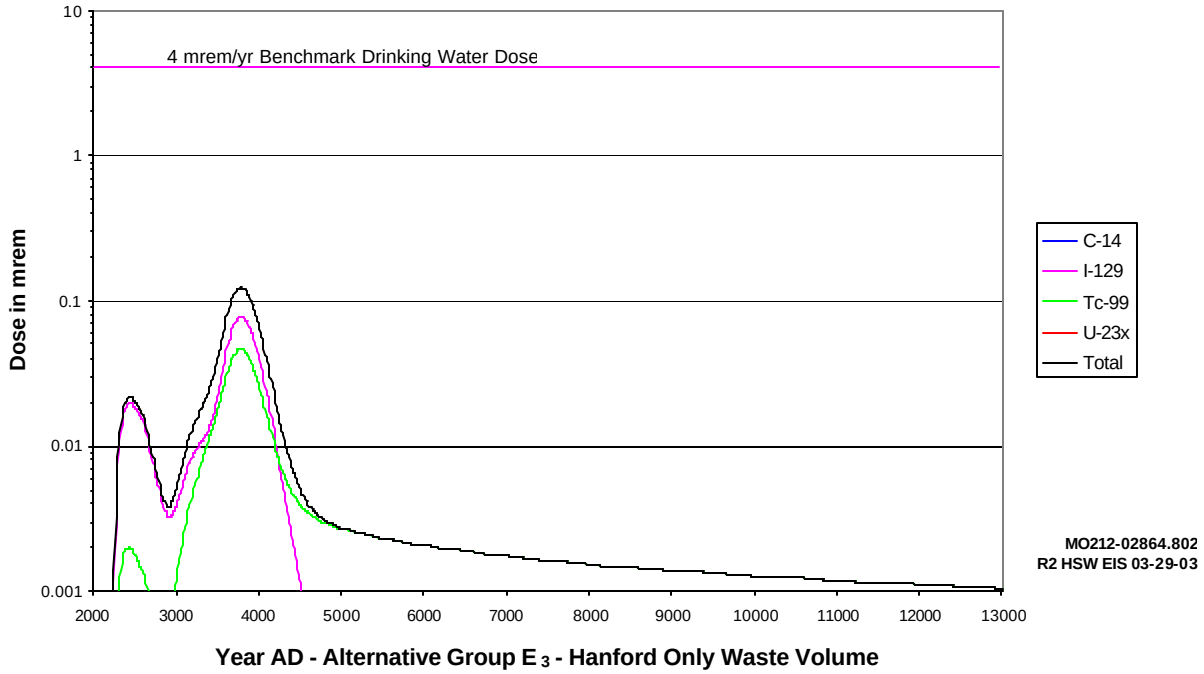


Figure F.31. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group E_2



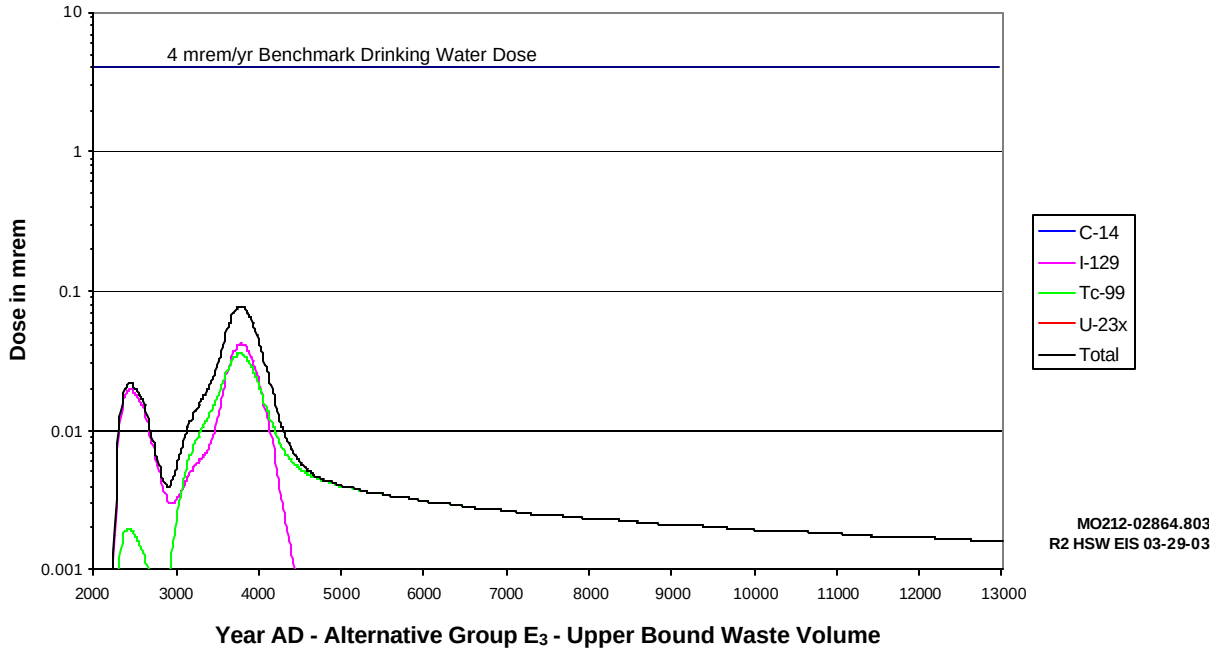
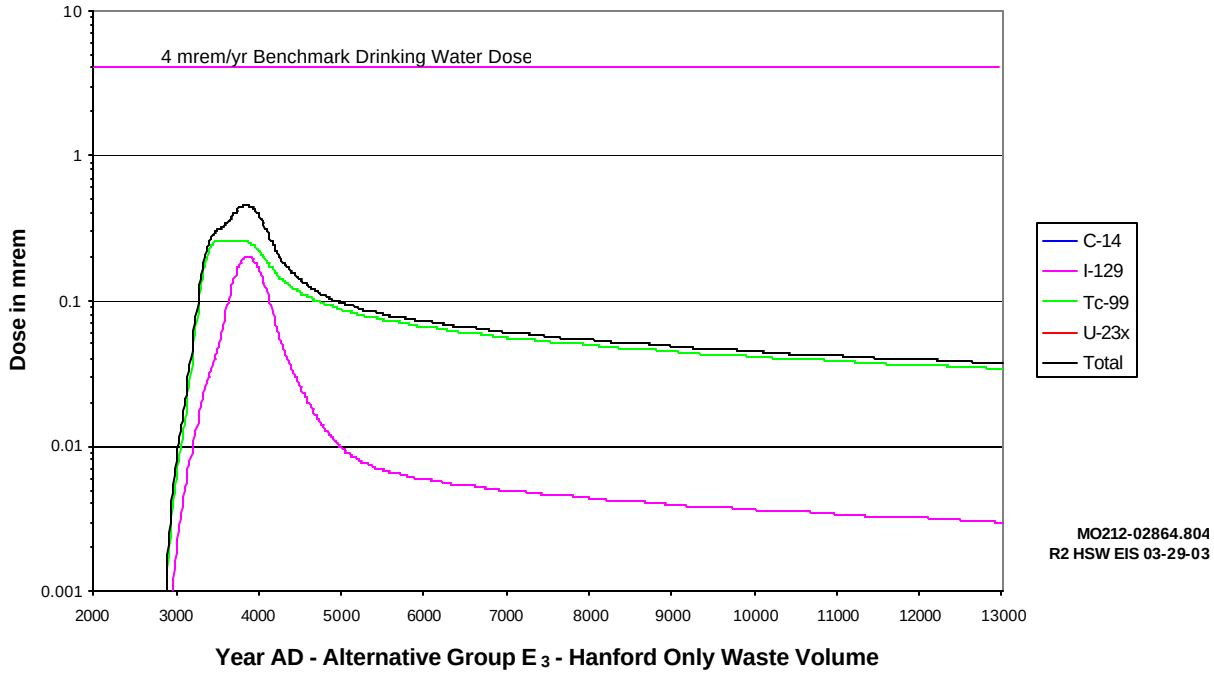


Figure F.32. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, Alternative Group E_3



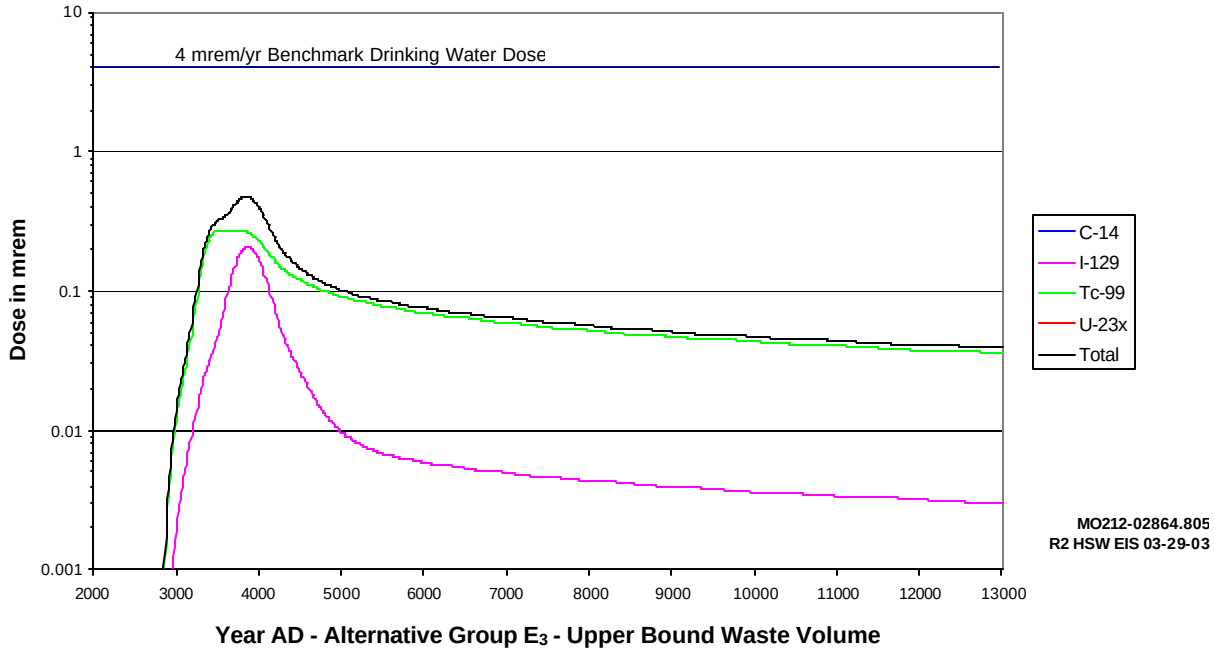
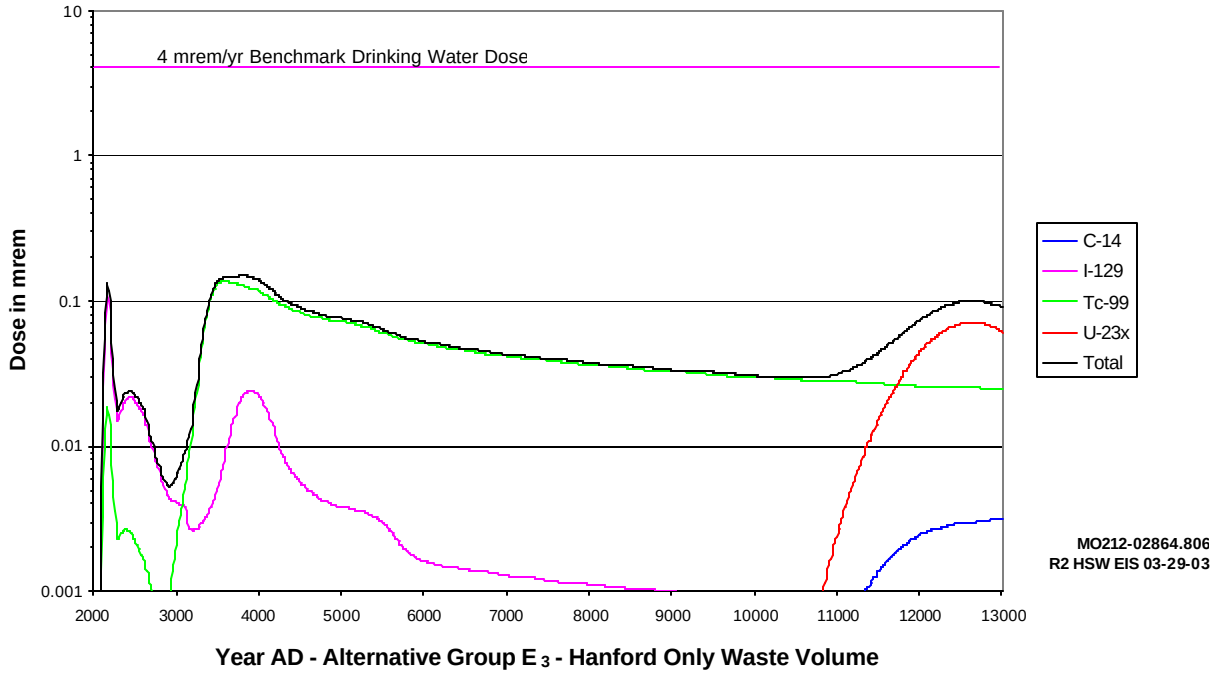


Figure F.33. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from ERDF, Alternative Group E_3



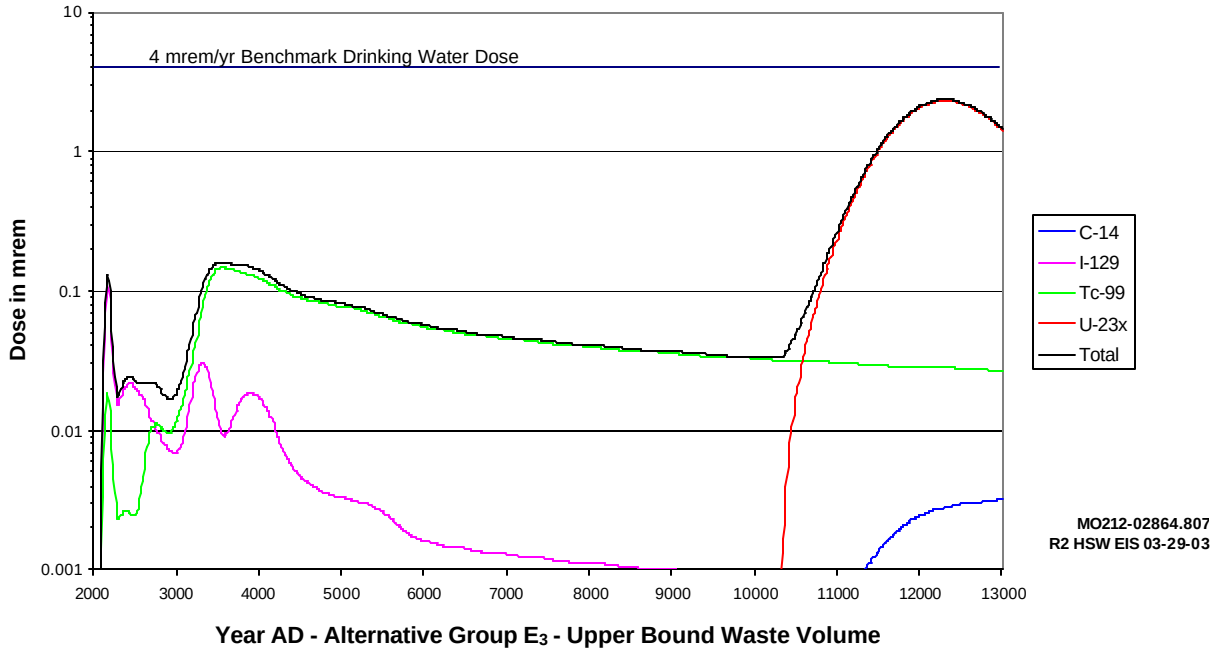
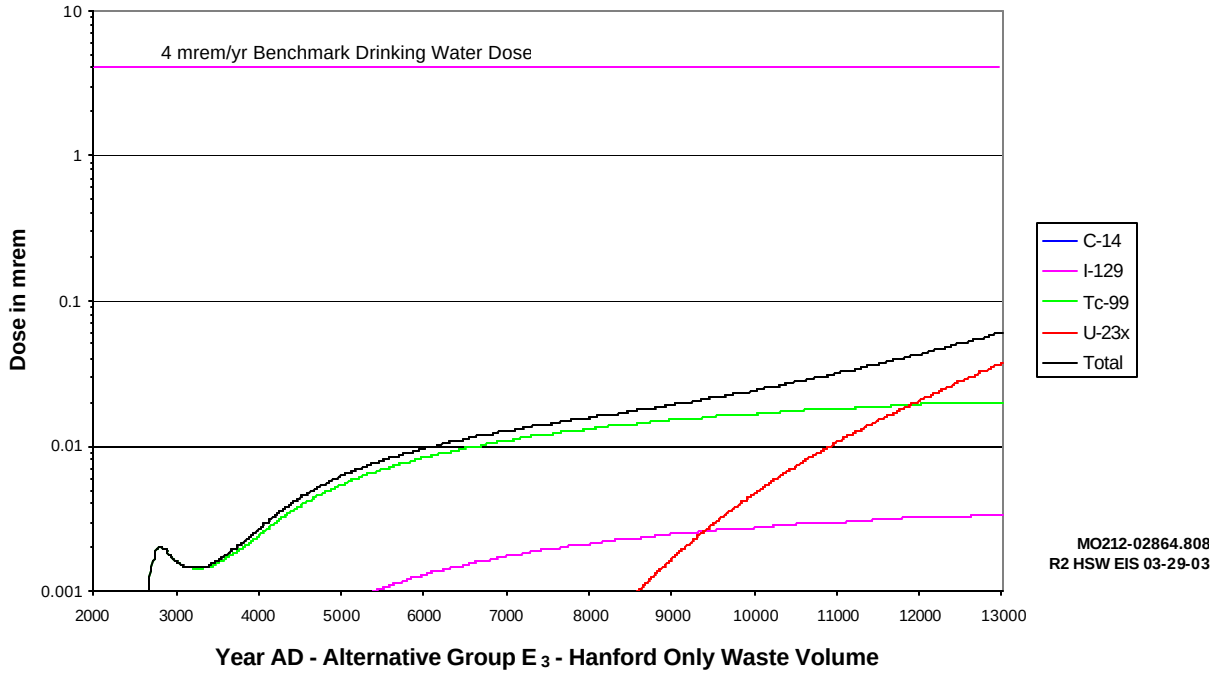


Figure F.34. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, Alternative Group E_3



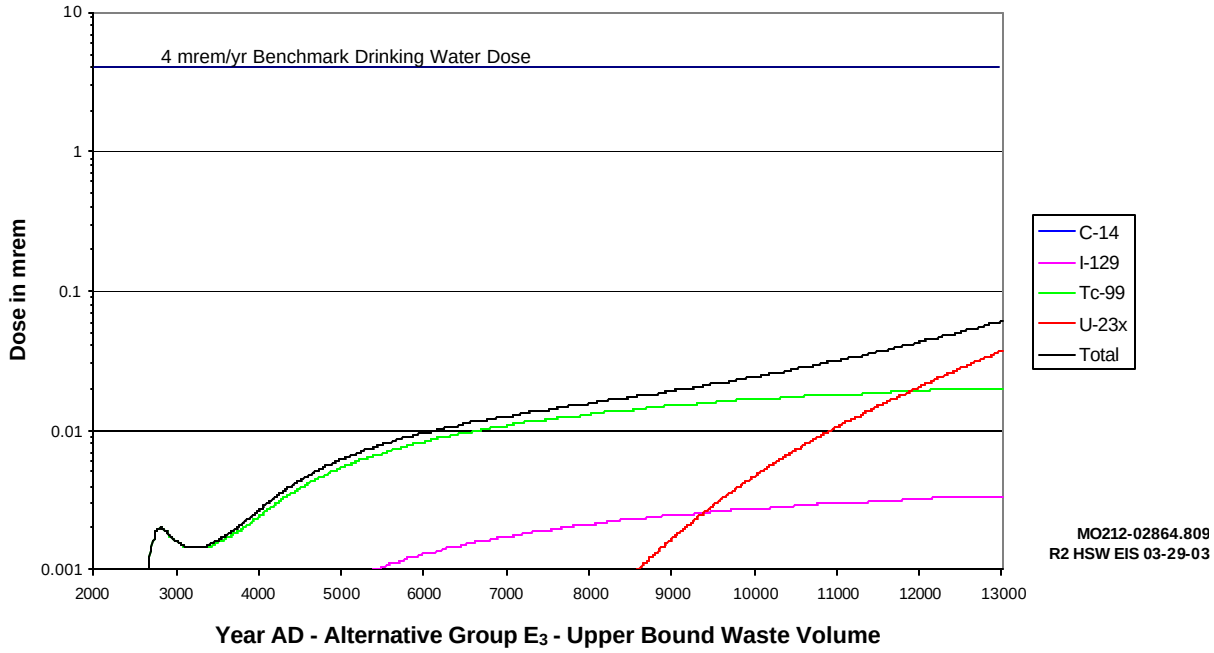
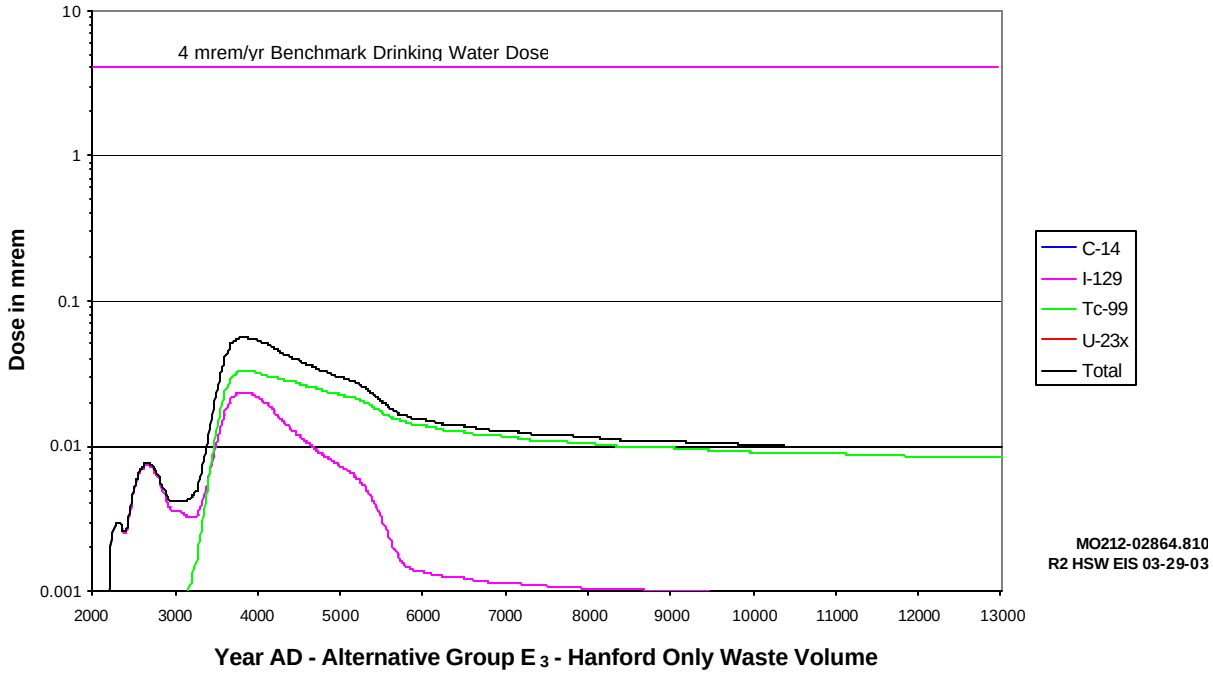


Figure F.35. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Southeast of 200 East Area, Alternative Group E_3



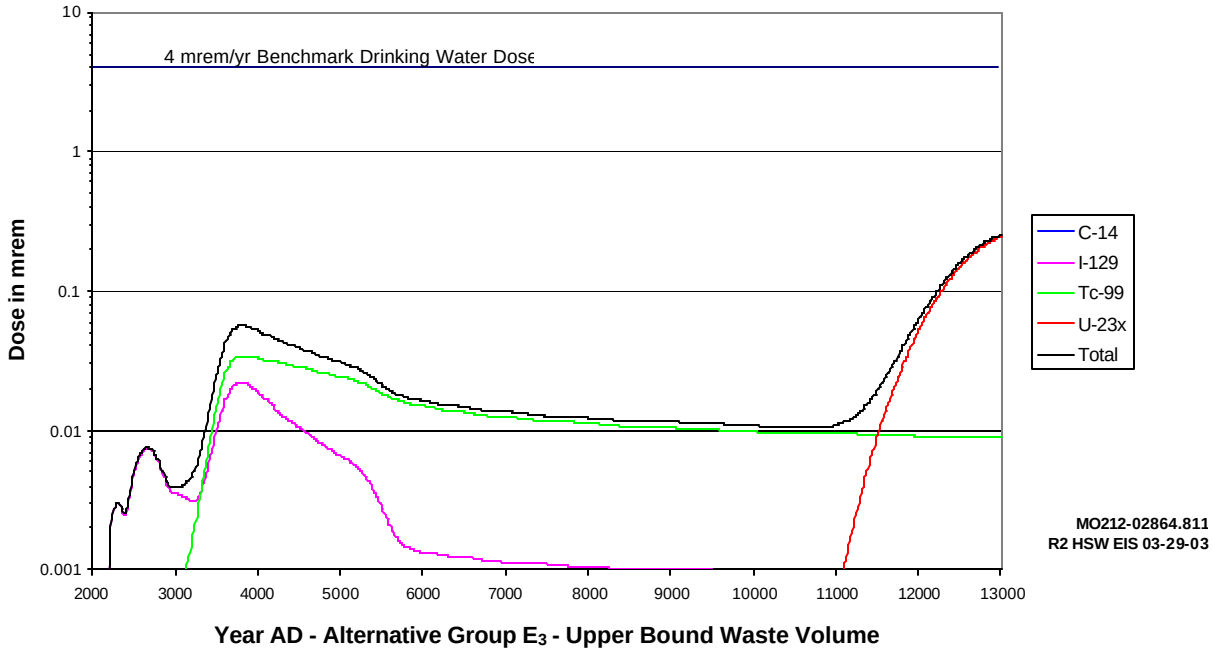


Figure F.36. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, Alternative Group E_3

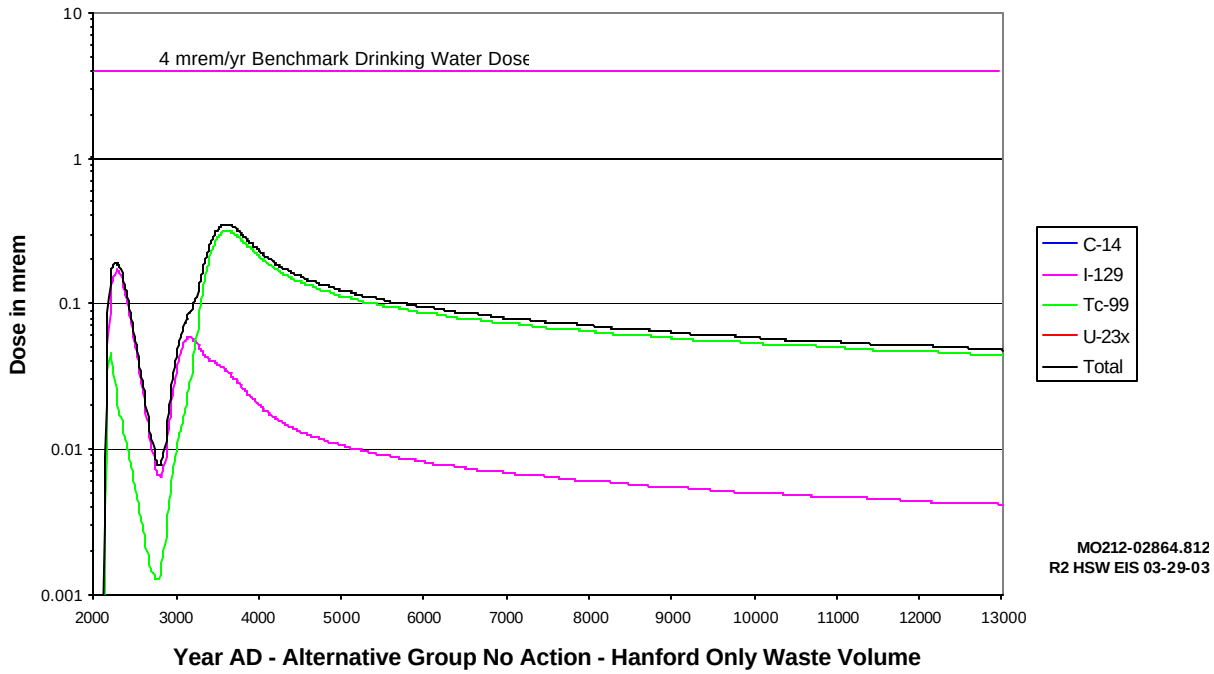


Figure F.37. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient from 200 West Area, No Action Alternative

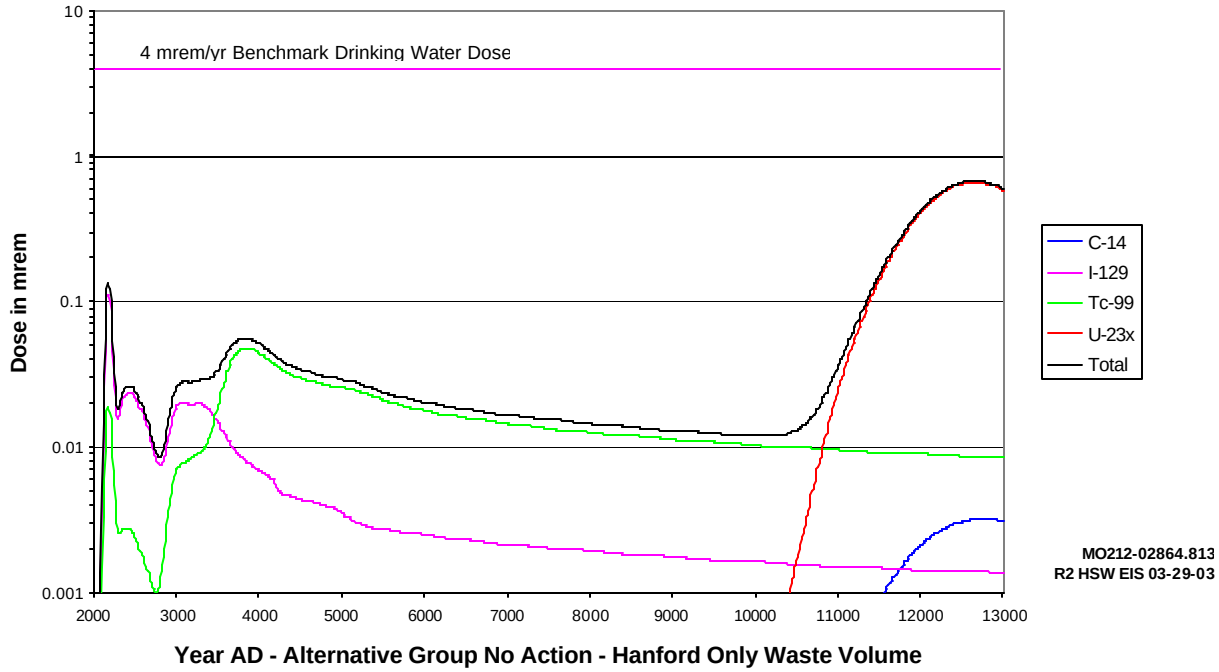


Figure F.38. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well 1 km Down-Gradient Northwest from 200 East Area, No Action Alternative

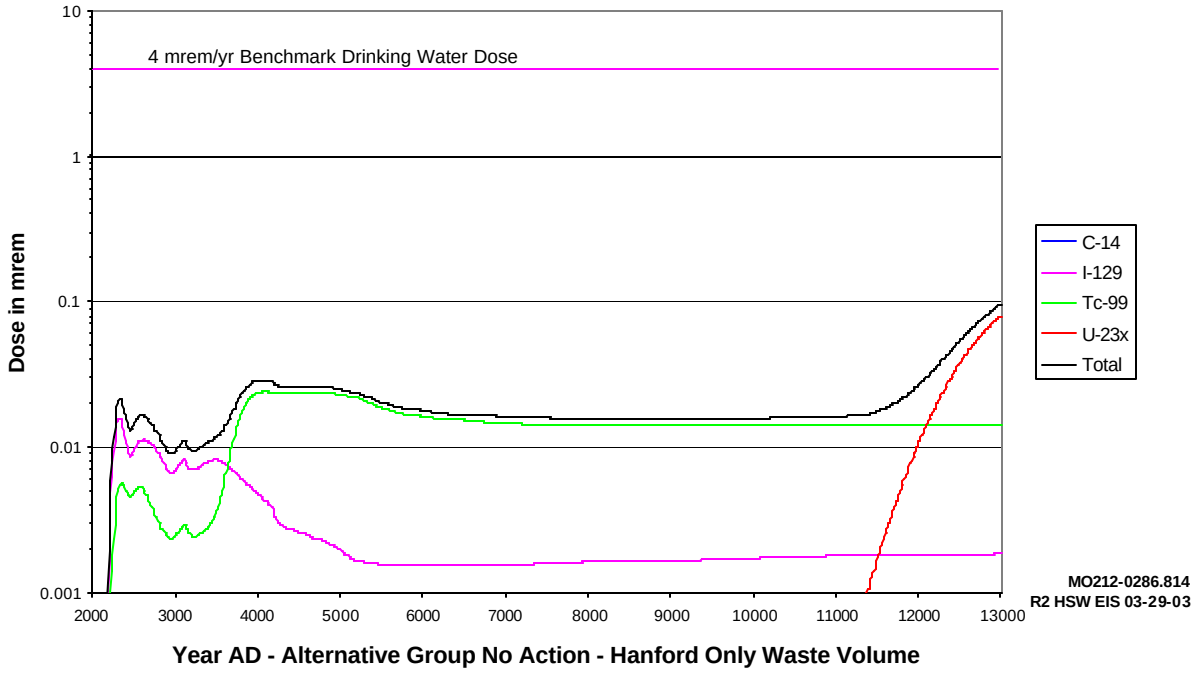


Figure F.39. Annual Drinking Water Dose at Various Times over 10,000 Years in Water from a Well Adjacent to the Columbia River, No Action Alternative

The radiation doses received from groundwater are evaluated using dose conversion factors specific to radionuclides and exposure scenarios. The dose factors used for drinking water ingestion, resident gardener, and resident gardener with sauna/sweat lodge are given in Table F.52.

Table F.52. Exposure Scenario Dose Factors for Use of Groundwater

Radionuclide	Annual Dose Factor by Exposure Scenario (mrem/yr per pCi/L)		
	Drinking Water	Resident Gardener	Resident Gardener with Sauna
C14	1.53E-03	4.09E-02	4.43E-02
Tc99	1.07E-03	3.66E-03	1.74E-02
I129	2.02E-01	6.20E-01	9.06E-01
U233	2.11E-01	2.56E-01	2.22E+02
U234	2.07E-01	2.51E-01	2.17E+02
U235	1.94E-01	2.35E-01	2.02E+02
U236	1.97E-01	2.39E-01	2.06E+02
U238	1.86E-01	2.26E-01	1.94E+02

A summary of groundwater dose results as a function of time is presented in Section 5.11.2 for each alternative. This section presents tables of the peak impacts and the time of peak impact by waste stream and period of disposal. These tables also present the health impact estimates for the resident gardener scenario with the sauna/sweat lodge included. The contents of Tables F.54 through F.140 are indexed in Table F.53.

Table F.53. Content of Tables for Groundwater Analysis Results

Alternative	200 East Area 1-km Point of Analysis			200 West Area 1- km Point of Analysis			Columbia River Point of Analysis		
	Waste Volume			Waste Volume			Waste Volume		
	Hanford	Lower	Upper	Hanford	Lower	Upper	Hanford	Lower	Upper
Group A	F.53	F.54	F.55	F.56	F.57	F.58	F.59	F.60	F.61
Group B	F.62	F.63	F.64	F.65	F.66	F.67	F.68	F.69	F.70
Group C	F.71	F.72	F.73	F.74	F.75	F.76	F.77	F.78	F.79
Group D_1	F.80	F.81	F.82	F.83	F.84	F.85	F.86	F.87	F.88
Group D_2	F.89	F.90	F.91	F.92	F.93	F.94	F.95	F.96	F.97
Group D_3	F.98	F.99	F.100	F.101	F.102	F.103	F.104	F.105	F.106
Group E_1	F.107	F.108	F.109	F.110	F.111	F.112	F.113	F.114	F.115
Group E_2	F.116	F.117	F.118	F.119	F.120	F.121	F.122	F.123	F.124
Group E_3	F.125	F.126	F.127	F.128	F.129	F.130	F.131	F.132	F.133
No Action	F.134	F.135	NA	F.136	F.137	NA	F.138	F.139	NA
NA = not applicable.									

Table F.54. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater over 10,000 Years – Alternative Group A, Hanford Only Waste Volume

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	10000	2.6E-04	7.8E-03	4.7E-06
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	5.8E-06	1.7E-04	1.0E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	3.5E-06	1.0E-04	6.2E-08
MLLW	200 West Area	Resident Gardener	1810	7.3E-05	2.2E-03	1.3E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	1.6E-05	4.8E-04	2.9E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.9E-04	3.0E-07
MLLW	200 West Area	Resident Gardener + Sauna	1810	1.9E-04	5.8E-03	3.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2070	9.3E-06	2.8E-04	1.7E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	1.7E-04	5.0E-03	3.0E-06
MLLW	200 East Area	Resident Gardener	1370	7.9E-04	2.4E-02	1.4E-05
ILAW	200 East Area	Resident Gardener	10000	1.0E-04	3.0E-03	1.8E-06
Melters	200 East Area	Resident Gardener	670	1.0E-05	3.0E-04	1.8E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2070	3.4E-05	1.0E-03	6.2E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.6E-04	2.3E-02	1.4E-05
MLLW	200 East Area	Resident Gardener + Sauna	1370	2.0E-03	6.1E-02	3.7E-05
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.5E-02	1.0E-00	6.0E-04
Melters	200 East Area	Resident Gardener + Sauna	10000	7.7E-04	2.3E-02	1.4E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of a LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.55. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	110	2.7E-02	8.0E-01	4.8E-04
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	7.0E-06	2.1E-04	1.3E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	3.5E-06	1.0E-04	6.2E-08
MLLW	200 West Area	Resident Gardener	1810	7.3E-05	2.2E-03	1.3E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	2.0E-05	5.9E-04	3.5E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.9E-04	3.0E-07
MLLW	200 West Area	Resident Gardener + Sauna	1810	1.9E-04	5.8E-03	3.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2070	1.1E-05	3.4E-04	2.0E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	1.7E-04	5.0E-03	3.0E-06
MLLW	200 East Area	Resident Gardener	1390	7.9E-04	2.4E-02	1.4E-05
ILAW	200 East Area	Resident Gardener	10000	1.0E-04	3.0E-03	1.8E-06
Melters	200 East Area	Resident Gardener	980	2.4E-06	7.1E-05	4.3E-08
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2070	4.2E-05	1.3E-03	7.5E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.6E-04	2.3E-02	1.4E-05
MLLW	200 East Area	Resident Gardener + Sauna	1360	2.0E-03	6.1E-02	3.7E-05
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.5E-02	1.0E-00	6.0E-04
Melters	200 East Area	Resident Gardener + Sauna	10000	7.8E-04	2.3E-02	1.4E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.56. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Upper Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	110	2.7E-02	8.0E-01	4.8E-04
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	7.3E-06	2.2E-04	1.3E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	3.5E-06	1.0E-04	6.2E-08
MLLW	200 West Area	Resident Gardener	1690	1.9E-04	5.7E-03	3.4E-06
	200 East Area	Resident Gardener	10000	2.8E-03	8.3E-02	5.0E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	2.1E-05	6.2E-04	3.7E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.9E-04	3.0E-07
MLLW	200 West Area	Resident Gardener + Sauna	1590	5.6E-04	1.7E-02	1.0E-05
	200 East Area	Resident Gardener + Sauna	10000	2.2E+00	6.7E+01	4.0E-02
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2070	1.1E-05	3.4E-04	2.0E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	1.7E-04	5.0E-03	3.0E-06
MLLW	200 East Area	Resident Gardener	1360	8.1E-04	2.4E-02	1.5E-05
ILAW	200 East Area	Resident Gardener	10000	1.0E-04	3.0E-03	1.8E-06
Melters	200 East Area	Resident Gardener	670	1.0E-05	3.0E-04	1.8E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2070	4.2E-05	1.3E-03	7.6E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.6E-04	2.3E-02	1.4E-05
MLLW	200 East Area	Resident Gardener + Sauna	1360	2.1E-03	6.4E-02	3.8E-05
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.5E-02	1.0E-00	6.0E-04
Melters	200 East Area	Resident Gardener + Sauna	10000	7.7E-04	2.3E-02	1.4E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.57. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Hanford Only Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	2.7E-05	8.2E-04	4.9E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.4E-05	7.3E-04	4.4E-07
MLLW	200 West Area	Resident Gardener	1700	3.4E-04	1.0E-02	6.2E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	7.6E-05	2.3E-03	1.4E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.2E-04	3.5E-03	2.1E-06
MLLW	200 West Area	Resident Gardener + Sauna	1700	9.2E-04	2.8E-02	1.7E-05
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1910	4.8E-05	1.5E-03	8.7E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	1.2E-03	3.5E-02	2.1E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1910	1.8E-04	5.4E-03	3.2E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.3E-03	1.6E-01	9.6E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.58. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	3.3E-05	1.0E-03	6.0E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.4E-05	7.3E-04	4.4E-07
MLLW	200 West Area	Resident Gardener	1700	3.4E-04	1.0E-02	6.2E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	9.3E-05	2.8E-03	1.7E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.2E-04	3.5E-03	2.1E-06
MLLW	200 West Area	Resident Gardener + Sauna	1700	9.2E-04	2.8E-02	1.7E-05
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1910	5.9E-05	1.8E-03	1.1E-06
LLW Cat 3	200 West Area	Resident Gardener	1230	1.2E-03	3.5E-02	2.1E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1910	2.2E-04	6.5E-03	3.9E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.3E-03	1.6E-01	9.6E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.59. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Upper Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	3.4E-05	1.0E-03	6.2E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.4E-05	7.3E-04	4.4E-07
MLLW	200 West Area	Resident Gardener	1690	1.9E-04	5.7E-03	3.4E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	9.8E-05	3.0E-03	1.8E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.2E-04	3.5E-03	2.1E-06
MLLW	200 West Area	Resident Gardener + Sauna	1690	5.6E-04	1.7E-02	1.0E-05
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1910	5.9E-05	1.8E-03	1.1E-06
LLW Cat 3	200 West Area	Resident Gardener	1230	1.2E-03	3.5E-02	2.1E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1910	2.2E-04	6.6E-03	4.0E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.3E-03	1.6E-01	9.6E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.60. Potential Individual Human Health Impacts to a Resident Gardener at the Columbia River Well from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Hanford Only Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	530	7.6E-07	2.3E-05	1.4E-08
	200 East Area	Resident Gardener	260	6.6E-06	2.0E-04	1.2E-07
	200 West Area	Resident Gardener + Sauna	530	3.1E-06	9.4E-05	5.7E-08
	200 East Area	Resident Gardener + Sauna	10000	4.5E-03	1.4E-01	8.2E-05
1970 – 1988	200 West Area	Resident Gardener	610	1.2E-06	3.7E-05	2.2E-08
	200 East Area	Resident Gardener	260	2.9E-05	8.7E-04	5.2E-07
	200 West Area	Resident Gardener + Sauna	610	1.8E-06	5.5E-05	3.3E-08
	200 East Area	Resident Gardener + Sauna	10000	7.4E-05	2.2E-03	1.3E-06
1988 – 1995	200 West Area	Resident Gardener	600	2.1E-05	6.4E-04	3.9E-07
	200 East Area	Resident Gardener	260	1.4E-06	4.2E-05	2.5E-08
	200 West Area	Resident Gardener + Sauna	600	3.1E-05	9.4E-04	5.6E-07
	200 East Area	Resident Gardener + Sauna	10000	1.5E-05	4.6E-04	2.8E-07
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2000	2.4E-06	7.2E-05	4.3E-08
LLW Cat 3	200 West Area	Resident Gardener	1710	1.7E-06	5.1E-05	3.0E-08
MLLW	200 West Area	Resident Gardener	2000	3.0E-05	9.1E-04	5.4E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2000	6.7E-06	2.0E-04	1.2E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	8.0E-06	2.4E-04	1.4E-07
MLLW	200 West Area	Resident Gardener + Sauna	2000	8.1E-05	2.4E-03	1.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2260	4.5E-06	1.3E-04	8.1E-08
LLW Cat 3	200 West Area	Resident Gardener	1710	8.2E-05	2.5E-03	1.5E-06
MLLW	200 East Area	Resident Gardener	1580	1.1E-04	3.4E-03	2.0E-06
ILAW	200 East Area	Resident Gardener	10000	1.3E-05	3.8E-04	2.3E-07
Melters	200 East Area	Resident Gardener	940	1.2E-06	3.7E-05	2.2E-08
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2260	1.7E-05	5.0E-04	3.0E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	3.7E-04	1.1E-02	6.7E-06
MLLW	200 East Area	Resident Gardener + Sauna	1580	2.9E-04	8.7E-03	5.2E-06
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.3E-05	9.8E-02	5.9E-05
Melters	200 East Area	Resident Gardener + Sauna	10000	1.1E-05	3.2E-04	1.9E-07

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.61. Potential Individual Human Health Impacts to a Resident Gardener at the Columbia River Well from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	530	7.6E-07	2.3E-05	1.4E-08
	200 East Area	Resident Gardener	260	6.6E-06	2.0E-04	1.2E-07
	200 West Area	Resident Gardener + Sauna	530	3.1E-06	9.4E-05	5.7E-08
	200 East Area	Resident Gardener + Sauna	10000	4.5E-03	1.4E-01	8.2E-05
1970 – 1988	200 West Area	Resident Gardener	610	1.2E-06	3.7E-05	2.2E-08
	200 East Area	Resident Gardener	260	2.9E-05	8.7E-04	5.2E-07
	200 West Area	Resident Gardener + Sauna	610	1.8E-06	5.5E-05	3.3E-08
	200 East Area	Resident Gardener + Sauna	10000	7.4E-05	2.2E-03	1.3E-06
1988 – 1995	200 West Area	Resident Gardener	600	2.1E-05	6.4E-04	3.9E-07
	200 East Area	Resident Gardener	260	1.4E-06	4.2E-05	2.5E-08
	200 West Area	Resident Gardener + Sauna	600	3.1E-05	9.4E-04	5.6E-07
	200 East Area	Resident Gardener + Sauna	10000	1.5E-05	4.6E-04	2.8E-07
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2000	2.9E-06	8.7E-05	5.2E-08
LLW Cat 3	200 West Area	Resident Gardener	1710	1.7E-06	5.1E-05	3.0E-08
MLLW	200 West Area	Resident Gardener	2000	3.0E-05	9.1E-04	5.4E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2000	8.1E-06	2.4E-04	1.5E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	8.0E-06	2.4E-04	1.4E-07
MLLW	200 West Area	Resident Gardener + Sauna	2000	8.1E-05	2.4E-03	1.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2260	5.5E-06	1.6E-04	8.2E-08
LLW Cat 3	200 West Area	Resident Gardener	1710	8.2E-05	2.5E-03	1.2E-06
MLLW	200 East Area	Resident Gardener	1580	1.1E-04	3.4E-03	1.7E-06
ILAW	200 East Area	Resident Gardener	10000	1.3E-05	3.8E-04	2.3E-07
Melters	200 East Area	Resident Gardener	940	1.2E-06	3.7E-05	1.8E-08
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2260	2.0E-05	6.1E-04	3.6E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	3.7E-04	1.1E-02	6.7E-06
MLLW	200 East Area	Resident Gardener + Sauna	1590	2.9E-04	8.8E-03	5.3E-06
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.3E-05	9.8E-02	5.9E-05
Melters	200 East Area	Resident Gardener + Sauna	10000	1.1E-05	4.6E-04	2.8E-07

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.62. Potential Individual Human Health Impacts to a Resident Gardener at the Columbia River Well from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group A, Upper Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	530	7.6E-07	2.3E-05	1.4E-08
	200 East Area	Resident Gardener	260	6.6E-06	2.0E-04	1.2E-07
	200 West Area	Resident Gardener + Sauna	530	3.1E-06	9.4E-05	5.7E-08
	200 East Area	Resident Gardener + Sauna	10000	4.5E-03	1.4E-01	8.2E-05
1970 – 1988	200 West Area	Resident Gardener	610	1.2E-06	3.7E-05	2.2E-08
	200 East Area	Resident Gardener	260	2.9E-05	8.7E-04	5.2E-07
	200 West Area	Resident Gardener + Sauna	610	1.8E-06	5.5E-05	3.3E-08
	200 East Area	Resident Gardener + Sauna	10000	7.4E-05	2.2E-03	1.3E-06
1988 – 1995	200 West Area	Resident Gardener	600	2.1E-05	6.4E-04	3.9E-07
	200 East Area	Resident Gardener	260	1.4E-06	4.2E-05	2.5E-08
	200 West Area	Resident Gardener + Sauna	600	3.1E-05	9.4E-04	5.6E-07
	200 East Area	Resident Gardener + Sauna	10000	1.5E-05	4.6E-04	2.8E-07
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2000	3.0E-06	9.1E-05	5.4E-08
LLW Cat 3	200 West Area	Resident Gardener	1710	1.7E-06	5.1E-05	3.0E-08
MLLW	200 West Area	Resident Gardener	2000	1.7E-05	5.2E-04	3.1E-07
	200 East Area	Resident Gardener	810	2.8E-05	8.4E-04	5.0E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2000	8.6E-06	2.6E-04	1.6E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	8.0E-06	2.4E-04	1.4E-07
MLLW	200 West Area	Resident Gardener + Sauna	2000	5.2E-05	1.6E-03	9.4E-07
	200 East Area	Resident Gardener + Sauna	810	7.9E-05	2.4E-03	1.4E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2260	5.5E-06	1.7E-04	9.9E-08
LLW Cat 3	200 West Area	Resident Gardener	1710	8.2E-05	2.5E-03	1.5E-06
MLLW	200 East Area	Resident Gardener	1580	1.1E-04	3.3E-03	2.0E-06
ILAW	200 East Area	Resident Gardener	10000	1.3E-05	3.8E-04	2.3E-07
Melters	200 East Area	Resident Gardener	940	1.2E-06	3.7E-05	2.2E-08
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2260	2.0E-05	6.1E-04	3.7E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	3.7E-04	1.1E-02	6.7E-06
MLLW	200 East Area	Resident Gardener + Sauna	1580	2.9E-04	8.7E-03	5.2E-06
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.3E-05	9.8E-02	5.9E-05
Melters	200 East Area	Resident Gardener + Sauna	10000	1.1E-05	3.2E-04	1.9E-07

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.63. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Hanford Only Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	10000	2.6E-04	7.8E-03	4.7E-06
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	5.5E-06	1.7E-04	1.0E-07
	200 East Area	Resident Gardener	1230	8.5E-07	2.5E-05	1.5E-08
LLW Cat 3	200 West Area	Resident Gardener	1450	3.3E-06	1.0E-04	6.0E-08
	200 East Area	Resident Gardener	620	6.0E-06	1.8E-04	1.1E-07
MLLW	200 West Area	Resident Gardener	1810	7.3E-05	2.2E-03	1.3E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	1.5E-05	4.6E-04	2.8E-07
	200 East Area	Resident Gardener + Sauna	10000	3.0E-04	9.0E-03	5.4E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.7E-04	2.8E-07
	200 East Area	Resident Gardener + Sauna	620	2.9E-05	8.6E-04	5.2E-07
MLLW	200 West Area	Resident Gardener + Sauna	1420	1.9E-04	5.8E-03	3.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1920	9.5E-06	2.8E-04	1.7E-07
	200 East Area	Resident Gardener	1320	1.1E-06	3.2E-05	1.9E-08
LLW Cat 3	200 West Area	Resident Gardener	1450	1.6E-04	4.9E-03	2.9E-06
	200 East Area	Resident Gardener	10000	3.0E-04	9.1E-03	5.4E-06
MLLW	200 East Area	Resident Gardener	1360	8.0E-04	2.4E-02	1.4E-05
Melters	200 East Area	Resident Gardener	680	2.6E-07	7.7E-06	4.6E-09
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1920	3.5E-05	1.1E-03	6.3E-07
	200 East Area	Resident Gardener + Sauna	1320	3.9E-06	1.2E-04	7.0E-08
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.3E-04	2.2E-02	1.3E-05
	200 East Area	Resident Gardener + Sauna	10000	2.4E-01	7.3E+00	4.4E-03
MLLW	200 East Area	Resident Gardener + Sauna	1360	2.1E-03	6.2E-02	3.7E-05
Melters	200 East Area	Resident Gardener + Sauna	680	1.2E-06	3.6E-05	2.2E-08

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of a LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.64. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	110	2.7E-02	8.0E-01	4.8E-04
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	6.8E-06	2.0E-04	1.2E-07
	200 East Area	Resident Gardener	1230	1.0E-06	3.1E-05	1.9E-08
LLW Cat 3	200 West Area	Resident Gardener	1450	3.3E-06	1.0E-04	6.0E-08
	200 East Area	Resident Gardener	620	4.2E-07	1.3E-05	7.6E-09
MLLW	200 West Area	Resident Gardener	1810	2.3E-05	6.8E-04	4.1E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	1.9E-05	5.6E-04	3.4E-07
	200 East Area	Resident Gardener + Sauna	10000	3.5E-04	1.0E-02	6.3E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.7E-04	2.8E-07
	200 East Area	Resident Gardener + Sauna	10000	2.3E-06	6.8E-05	4.1E-08
MLLW	200 West Area	Resident Gardener + Sauna	1810	2.0E-04	5.9E-03	3.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1920	1.2E-05	3.5E-04	2.1E-07
	200 East Area	Resident Gardener	1320	1.3E-06	3.8E-05	2.3E-08
LLW Cat 3	200 West Area	Resident Gardener	1450	1.6E-04	4.9E-03	2.9E-06
	200 East Area	Resident Gardener	10000	3.1E-04	9.3E-03	5.6E-06
MLLW	200 East Area	Resident Gardener	1360	8.0E-04	2.4E-02	1.4E-05
Melters	200 East Area	Resident Gardener	680	2.6E-07	7.7E-06	4.6E-09
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1920	4.3E-05	1.3E-03	7.7E-07
	200 East Area	Resident Gardener + Sauna	10000	7.5E-04	2.2E-02	1.3E-05
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.3E-04	2.2E-02	1.3E-05
	200 East Area	Resident Gardener + Sauna	10000	2.5E-01	7.5E+00	4.5E-03
MLLW	200 East Area	Resident Gardener + Sauna	1360	2.1E-03	6.2E-02	3.7E-05
Melters	200 East Area	Resident Gardener + Sauna	680	1.2E-06	3.6E-05	2.2E-08

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.65. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Upper Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	110	2.7E-02	8.0E-01	4.8E-04
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	6.3E-06	1.9E-04	1.1E-07
	200 East Area	Resident Gardener	1230	3.9E-06	1.2E-04	7.1E-08
LLW Cat 3	200 West Area	Resident Gardener	1450	3.3E-06	1.0E-04	6.0E-08
	200 East Area	Resident Gardener	620	4.4E-07	1.3E-05	7.9E-09
MLLW	200 West Area	Resident Gardener	1810	4.1E-05	1.2E-03	7.4E-07
	200 East Area	Resident Gardener	10000	2.6E-03	7.8E-02	4.7E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	1.8E-05	5.4E-04	3.2E-07
	200 East Area	Resident Gardener + Sauna	10000	5.5E-05	1.6E-03	9.8E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.7E-04	2.8E-07
	200 East Area	Resident Gardener + Sauna	10000	1.7E-05	5.0E-04	3.0E-07
MLLW	200 West Area	Resident Gardener + Sauna	1810	1.2E-04	3.6E-03	2.2E-06
	200 East Area	Resident Gardener + Sauna	10000	2.2E+00	6.7E+01	4.0E-02
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1920	1.0E-05	3.1E-04	1.9E-07
	200 East Area	Resident Gardener	1210	6.1E-06	1.8E-04	1.1E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	1.6E-04	4.9E-03	2.9E-06
	200 East Area	Resident Gardener	10000	3.1E-04	9.4E-03	5.6E-06
MLLW	200 East Area	Resident Gardener	1240	1.0E-03	3.1E-02	1.8E-05
Melters	200 East Area	Resident Gardener	680	2.6E-07	7.7E-06	4.6E-09
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1920	3.9E-05	1.2E-03	7.0E-07
	200 East Area	Resident Gardener + Sauna	1210	2.3E-05	7.0E-04	4.2E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.3E-04	2.2E-02	1.3E-05
	200 East Area	Resident Gardener + Sauna	10000	2.5E-01	7.6E+00	4.5E-03
MLLW	200 East Area	Resident Gardener + Sauna	1240	2.7E-03	8.0E-02	4.8E-05
Melters	200 East Area	Resident Gardener + Sauna	680	1.2E-06	3.6E-05	2.2E-08

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.66. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Hanford Only Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	2.6E-05	7.9E-04	4.7E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.3E-05	7.0E-04	4.2E-07
MLLW	200 West Area	Resident Gardener	1700	3.4E-04	1.0E-02	6.2E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	7.3E-05	2.2E-03	1.3E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.1E-04	3.3E-03	2.0E-06
MLLW	200 West Area	Resident Gardener + Sauna	1700	9.2E-04	2.8E-02	1.7E-05
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1770	5.0E-05	1.5E-03	9.0E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	1.1E-03	3.4E-02	2.1E-05
ILAW	200 West Area	Resident Gardener	10000	3.1E-04	9.2E-03	5.5E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1770	1.8E-04	5.5E-03	3.3E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.1E-03	1.5E-01	9.2E-05
ILAW	200 West Area	Resident Gardener + Sauna	10000	1.1E-01	3.3E-00	2.0E-03

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.67. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	3.2E-05	9.6E-04	5.8E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.3E-05	7.0E-04	4.2E-07
MLLW	200 West Area	Resident Gardener	1700	3.4E-04	1.0E-02	6.2E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	8.9E-05	2.7E-03	1.6E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.1E-04	3.3E-03	2.0E-06
MLLW	200 West Area	Resident Gardener + Sauna	1700	9.2E-04	2.8E-02	1.7E-05
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1770	6.1E-05	1.8E-03	1.1E-06
LLW Cat 3	200 West Area	Resident Gardener	1230	1.1E-03	3.4E-02	2.1E-05
ILAW	200 West Area	Resident Gardener	10000	3.1E-04	9.2E-03	5.5E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	10000	2.4E-02	7.3E-01	4.4E-04
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.1E-03	1.5E-01	9.2E-05
ILAW	200 West Area	Resident Gardener + Sauna	10000	1.1E-01	3.3E-00	2.0E-03

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.68. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Upper Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	3.0E-05	8.9E-04	5.3E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.3E-05	7.0E-04	4.2E-07
MLLW	200 West Area	Resident Gardener	1690	1.9E-04	5.6E-03	3.4E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	8.5E-05	2.5E-03	1.5E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.1E-04	3.3E-03	2.0E-06
MLLW	200 West Area	Resident Gardener + Sauna	1690	5.4E-04	1.6E-02	9.7E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1770	5.5E-05	1.6E-03	9.9E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	1.1E-03	3.4E-02	2.1E-05
ILAW	200 West Area	Resident Gardener	10000	3.1E-04	9.2E-03	5.5E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	10000	2.1E-02	6.2E-01	3.7E-04
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.1E-03	1.5E-01	9.2E-05
ILAW	200 West Area	Resident Gardener + Sauna	10000	1.1E-01	3.3E-00	2.0E-03

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.69 Potential Individual Human Health Impacts to a Resident Gardener at the Columbia River Well from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Hanford Only Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	530	7.6E-07	2.3E-05	1.4E-08
	200 East Area	Resident Gardener	260	6.6E-06	2.0E-04	1.2E-07
	200 West Area	Resident Gardener + Sauna	530	3.1E-06	9.4E-05	5.7E-08
	200 East Area	Resident Gardener + Sauna	10000	4.5E-03	1.4E-01	8.2E-05
1970 – 1988	200 West Area	Resident Gardener	610	1.2E-06	3.7E-05	2.2E-08
	200 East Area	Resident Gardener	260	2.9E-05	8.7E-04	5.2E-07
	200 West Area	Resident Gardener + Sauna	610	1.8E-06	5.5E-05	3.3E-08
	200 East Area	Resident Gardener + Sauna	10000	7.4E-05	2.2E-03	1.3E-06
1988 – 1995	200 West Area	Resident Gardener	600	2.1E-05	6.4E-04	3.9E-07
	200 East Area	Resident Gardener	260	1.4E-06	4.2E-05	2.5E-08
	200 West Area	Resident Gardener + Sauna	600	3.1E-05	9.4E-04	5.6E-07
	200 East Area	Resident Gardener + Sauna	10000	1.5E-05	4.6E-04	2.8E-07
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2000	2.3E-06	6.9E-05	4.1E-08
	200 East Area	Resident Gardener	1400	1.4E-07	4.3E-06	2.6E-09
LLW Cat 3	200 West Area	Resident Gardener	1710	1.6E-06	4.9E-05	2.9E-08
	200 East Area	Resident Gardener	860	1.4E-06	4.2E-05	2.5E-08
MLLW	200 West Area	Resident Gardener	2000	3.0E-05	9.1E-04	5.4E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2000	6.4E-06	1.9E-04	1.2E-07
	200 East Area	Resident Gardener + Sauna	10000	1.2E-05	3.7E-04	2.2E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	7.7E-06	2.3E-04	1.4E-07
	200 East Area	Resident Gardener + Sauna	860	6.7E-06	2.0E-04	1.2E-07
MLLW	200 West Area	Resident Gardener + Sauna	2000	8.1E-05	2.4E-03	1.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2110	4.5E-06	1.4E-04	8.2E-08
	200 East Area	Resident Gardener	2330	1.2E-05	3.5E-04	2.1E-07
LLW Cat 3	200 West Area	Resident Gardener	1710	7.9E-05	2.4E-03	1.4E-06
	200 East Area	Resident Gardener	10000	2.9E-04	8.6E-03	5.2E-06
MLLW	200 East Area	Resident Gardener	1980	1.3E-04	3.8E-03	2.3E-06
ILAW	200 West Area	Resident Gardener	10000	1.0E-05	3.0E-04	1.8E-07
Melters	200 East Area	Resident Gardener	940	3.2E-08	9.5E-07	5.7E-10
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2110	1.7E-05	5.0E-04	3.0E-07
	200 East Area	Resident Gardener + Sauna	10000	6.4E-04	1.9E-02	1.2E-05
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	3.6E-04	1.1E-02	6.4E-06
	200 East Area	Resident Gardener + Sauna	10000	2.4E-01	7.3E+00	4.4E-03
MLLW	200 East Area	Resident Gardener + Sauna	1610	3.2E-04	9.5E-03	5.7E-06
ILAW	200 West Area	Resident Gardener + Sauna	10000	2.6E-05	7.8E-02	4.7E-05
Melters	200 East Area	Resident Gardener + Sauna	940	1.5E-07	4.5E-06	2.7E-09

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.70. Potential Individual Human Health Impacts to a Resident Gardener at the Columbia River Well from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	530	7.6E-07	2.3E-05	1.4E-08
	200 East Area	Resident Gardener	260	6.6E-06	2.0E-04	1.2E-07
	200 West Area	Resident Gardener + Sauna	530	3.1E-06	9.4E-05	5.7E-08
	200 East Area	Resident Gardener + Sauna	10000	4.5E-03	1.4E-01	8.2E-05
1970 – 1988	200 West Area	Resident Gardener	610	1.2E-06	3.7E-05	2.2E-08
	200 East Area	Resident Gardener	260	2.9E-05	8.7E-04	5.2E-07
	200 West Area	Resident Gardener + Sauna	610	1.8E-06	5.5E-05	3.3E-08
	200 East Area	Resident Gardener + Sauna	10000	7.4E-05	2.2E-03	1.3E-06
1988 – 1995	200 West Area	Resident Gardener	600	2.1E-05	6.4E-04	3.9E-07
	200 East Area	Resident Gardener	260	1.4E-06	4.2E-05	2.5E-08
	200 West Area	Resident Gardener + Sauna	600	3.1E-05	9.4E-04	5.6E-07
	200 East Area	Resident Gardener + Sauna	10000	1.5E-05	4.6E-04	2.8E-07
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2000	2.8E-06	8.4E-05	5.0E-08
	200 East Area	Resident Gardener	1400	1.7E-07	5.2E-06	3.1E-09
LLW Cat 3	200 West Area	Resident Gardener	1710	1.6E-06	4.9E-05	2.9E-08
	200 East Area	Resident Gardener	860	9.8E-08	2.9E-06	1.8E-09
MLLW	200 West Area	Resident Gardener	2000	3.0E-05	9.1E-04	5.4E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2000	7.8E-06	2.3E-04	1.4E-07
	200 East Area	Resident Gardener + Sauna	10000	1.3E-05	3.9E-04	2.3E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	7.7E-06	2.3E-04	1.4E-07
	200 East Area	Resident Gardener + Sauna	860	4.6E-07	1.4E-05	8.4E-09
MLLW	200 West Area	Resident Gardener + Sauna	2000	8.1E-05	2.4E-03	1.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2110	5.5E-06	1.7E-04	1.0E-07
	200 East Area	Resident Gardener	2250	1.4E-05	4.2E-04	2.5E-07
LLW Cat 3	200 West Area	Resident Gardener	1710	7.9E-05	2.4E-03	1.4E-06
	200 East Area	Resident Gardener	10000	3.0E-04	8.9E-03	5.3E-06
MLLW	200 East Area	Resident Gardener	1420	1.3E-04	3.8E-03	2.3E-06
ILAW	200 West Area	Resident Gardener	10000	1.0E-05	3.0E-04	1.8E-07
Melters	200 East Area	Resident Gardener	940	3.2E-08	9.5E-07	5.7E-10
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2110	2.0E-05	6.1E-04	3.7E-07
	200 East Area	Resident Gardener + Sauna	10000	7.4E-04	2.2E-02	1.3E-05
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	3.6E-04	1.1E-02	6.4E-06
	200 East Area	Resident Gardener + Sauna	10000	2.5E-01	7.5E+00	4.5E-03
MLLW	200 East Area	Resident Gardener + Sauna	1420	3.3E-04	1.0E-02	6.0E-06
ILAW	200 West Area	Resident Gardener + Sauna	10000	2.6E-05	7.8E-02	4.7E-05
Melters	200 East Area	Resident Gardener + Sauna	940	1.5E-07	4.5E-06	2.7E-09

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.71. Potential Individual Human Health Impacts to a Resident Gardener at the Columbia River Well from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group B, Upper Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	530	7.6E-07	2.3E-05	1.4E-08
	200 East Area	Resident Gardener	260	6.6E-06	2.0E-04	1.2E-07
	200 West Area	Resident Gardener + Sauna	530	3.1E-06	9.4E-05	5.7E-08
	200 East Area	Resident Gardener + Sauna	10000	4.5E-03	1.4E-01	8.2E-05
1970 – 1988	200 West Area	Resident Gardener	610	1.2E-06	3.7E-05	2.2E-08
	200 East Area	Resident Gardener	260	2.9E-05	8.7E-04	5.2E-07
	200 West Area	Resident Gardener + Sauna	610	1.8E-06	5.5E-05	3.3E-08
	200 East Area	Resident Gardener + Sauna	10000	7.4E-05	2.2E-03	1.3E-06
1988 – 1995	200 West Area	Resident Gardener	600	2.1E-05	6.4E-04	3.9E-07
	200 East Area	Resident Gardener	260	1.4E-06	4.2E-05	2.5E-08
	200 West Area	Resident Gardener + Sauna	600	3.1E-05	9.4E-04	5.6E-07
	200 East Area	Resident Gardener + Sauna	10000	1.5E-05	4.6E-04	2.8E-07
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	2000	2.6E-06	7.8E-05	4.7E-08
	200 East Area	Resident Gardener	1400	6.6E-07	2.0E-05	1.2E-08
LLW Cat 3	200 West Area	Resident Gardener	1710	1.6E-06	4.9E-05	2.9E-08
	200 East Area	Resident Gardener	860	9.8E-08	2.9E-06	1.8E-09
MLLW	200 West Area	Resident Gardener	2000	1.7E-05	5.2E-04	3.1E-07
	200 East Area	Resident Gardener	10000	6.7E-05	2.0E-03	1.2E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2000	7.4E-06	2.2E-04	1.3E-07
	200 East Area	Resident Gardener + Sauna	1400	5.3E-05	1.6E-03	9.6E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	7.7E-06	2.3E-04	1.4E-07
	200 East Area	Resident Gardener + Sauna	860	6.4E-07	1.9E-05	1.2E-08
MLLW	200 West Area	Resident Gardener + Sauna	2000	5.2E-05	1.6E-03	9.4E-07
	200 East Area	Resident Gardener + Sauna	10000	3.5E-02	1.1E+00	6.4E-04
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2110	5.0E-06	1.5E-04	9.0E-08
	200 East Area	Resident Gardener	10000	6.1E-06	1.8E-04	1.1E-07
LLW Cat 3	200 West Area	Resident Gardener	1710	7.9E-05	2.4E-03	1.4E-06
	200 East Area	Resident Gardener	10000	3.0E-04	8.9E-03	5.3E-06
MLLW	200 East Area	Resident Gardener	1420	1.3E-04	4.0E-03	2.4E-06
ILAW	200 West Area	Resident Gardener	10000	1.0E-05	3.0E-04	1.8E-07
Melters	200 East Area	Resident Gardener	940	3.2E-08	9.5E-07	5.7E-10
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2110	1.9E-05	5.6E-04	3.3E-07
	200 East Area	Resident Gardener + Sauna	10000	4.0E-03	1.2E-01	7.2E-05
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1710	3.6E-04	1.1E-02	6.4E-06
	200 East Area	Resident Gardener + Sauna	10000	2.5E-01	7.6E+00	4.5E-03
MLLW	200 East Area	Resident Gardener + Sauna	1420	3.6E-04	1.1E-02	6.5E-06
ILAW	200 West Area	Resident Gardener + Sauna	10000	2.6E-05	7.8E-02	4.7E-05
Melters	200 East Area	Resident Gardener + Sauna	940	1.5E-07	4.5E-06	2.7E-09

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.72. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group C, Hanford Only Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	10000	2.6E-04	7.8E-03	4.7E-06
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	5.8E-06	1.7E-04	1.0E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	3.5E-06	1.0E-04	6.2E-08
MLLW	200 West Area	Resident Gardener	1810	7.3E-05	2.2E-03	1.3E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	1.6E-05	4.8E-04	2.9E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.9E-04	3.0E-07
MLLW	200 West Area	Resident Gardener + Sauna	1810	1.9E-04	5.8E-03	3.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2070	6.3E-06	1.9E-04	1.1E-07
LLW Cat 3	200 West Area	Resident Gardener	1460	1.7E-04	5.0E-03	3.0E-06
MLLW	200 East Area	Resident Gardener	1370	7.9E-04	2.4E-02	1.4E-05
ILAW	200 East Area	Resident Gardener	10000	1.0E-04	3.0E-03	1.8E-06
Melters	200 East Area	Resident Gardener	680	6.9E-06	2.1E-04	1.2E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2070	3.0E-05	9.0E-04	5.4E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1460	7.6E-04	2.3E-02	1.4E-05
MLLW	200 East Area	Resident Gardener + Sauna	1370	2.0E-03	6.1E-02	3.7E-05
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.5E-02	1.0E-00	6.0E-04
Melters	200 East Area	Resident Gardener + Sauna	10000	8.0E-04	2.4E-02	1.4E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of a LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.73. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group C, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	110	2.7E-02	8.0E-01	4.8E-04
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	7.0E-06	2.1E-04	1.3E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	3.5E-06	1.0E-04	6.2E-08
MLLW	200 West Area	Resident Gardener	1810	7.3E-05	2.2E-03	1.3E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	2.0E-05	5.9E-04	3.5E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.9E-04	3.0E-07
MLLW	200 West Area	Resident Gardener + Sauna	1810	1.9E-04	5.8E-03	3.5E-06
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2070	7.7E-06	2.3E-04	1.4E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	1.7E-04	5.0E-03	3.0E-06
MLLW	200 East Area	Resident Gardener	1370	7.9E-04	2.4E-02	1.4E-05
ILAW	200 East Area	Resident Gardener	10000	1.0E-04	3.0E-03	1.8E-06
Melters	200 East Area	Resident Gardener	680	6.9E-06	2.1E-04	1.2E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2070	3.7E-05	1.1E-03	6.6E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.6E-04	2.3E-02	1.4E-05
MLLW	200 East Area	Resident Gardener + Sauna	1370	2.0E-03	6.1E-02	3.7E-05
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.5E-02	1.0E-00	6.0E-04
Melters	200 East Area	Resident Gardener + Sauna	10000	8.0E-04	2.4E-02	1.4E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.74. Potential Individual Human Health Impacts to a Resident Gardener at the 200 East Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group C, Upper Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	350	2.0E-06	6.1E-05	3.6E-08
	200 East Area	Resident Gardener	10000	7.0E-05	2.1E-03	1.3E-06
	200 West Area	Resident Gardener + Sauna	350	8.7E-06	2.6E-04	1.6E-07
	200 East Area	Resident Gardener + Sauna	10000	6.1E-02	1.8E+00	1.1E-03
1970 – 1988	200 West Area	Resident Gardener	420	3.0E-06	9.1E-05	5.4E-08
	200 East Area	Resident Gardener	110	3.2E-04	9.7E-04	5.8E-07
	200 West Area	Resident Gardener + Sauna	420	4.4E-06	1.3E-04	7.9E-08
	200 East Area	Resident Gardener + Sauna	10000	1.2E-03	3.7E-03	2.2E-06
1988 – 1995	200 West Area	Resident Gardener	360	6.2E-05	1.9E-03	1.1E-06
	200 East Area	Resident Gardener	110	1.7E-02	5.2E-01	3.1E-04
	200 West Area	Resident Gardener + Sauna	360	1.1E-04	3.2E-03	1.9E-06
	200 East Area	Resident Gardener + Sauna	110	2.7E-02	8.0E-01	4.8E-04
Newly Generated Waste (1996 – 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1810	7.3E-06	2.2E-04	1.3E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	3.5E-06	1.0E-04	6.2E-08
MLLW	200 West Area	Resident Gardener	1810	4.1E-05	1.2E-03	7.4E-07
	200 East Area	Resident Gardener	10000	2.8E-03	8.3E-02	5.0E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1810	2.1E-05	6.2E-04	3.7E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	1.6E-05	4.9E-04	3.0E-07
MLLW	200 West Area	Resident Gardener + Sauna	1810	1.2E-04	3.6E-03	2.2E-06
	200 East Area	Resident Gardener + Sauna	10000	2.2E+00	6.7E+01	4.0E-02
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	2070	7.7E-06	2.3E-04	1.4E-07
LLW Cat 3	200 West Area	Resident Gardener	1450	1.7E-04	5.0E-03	3.0E-06
MLLW	200 East Area	Resident Gardener	1360	8.1E-04	2.4E-02	1.5E-05
ILAW	200 East Area	Resident Gardener	10000	1.0E-04	3.0E-03	1.8E-06
Melters	200 East Area	Resident Gardener	680	6.9E-06	2.1E-04	1.2E-07
LLW Cat 1	200 West Area	Resident Gardener + Sauna	2070	3.7E-05	1.1E-03	6.6E-07
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1450	7.6E-04	2.3E-02	1.4E-05
MLLW	200 East Area	Resident Gardener + Sauna	1360	2.1E-03	6.4E-02	3.8E-05
ILAW	200 East Area	Resident Gardener + Sauna	10000	3.5E-02	1.0E-00	6.0E-04
Melters	200 East Area	Resident Gardener + Sauna	10000	8.0E-04	2.4E-02	1.4E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.75. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group C, Hanford Only Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	2.7E-05	8.2E-04	4.9E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.4E-05	7.3E-04	4.4E-07
MLLW	200 West Area	Resident Gardener	1700	3.4E-04	1.0E-02	6.2E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	7.6E-05	2.3E-03	1.4E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.2E-04	3.5E-03	2.1E-06
MLLW	200 West Area	Resident Gardener + Sauna	1700	9.2E-04	2.8E-02	1.7E-05
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1910	4.8E-05	1.5E-03	8.7E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	1.2E-03	3.5E-02	2.1E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1910	1.8E-04	5.4E-03	3.2E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.3E-03	1.6E-01	9.6E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.

Table F.76. Potential Individual Human Health Impacts to a Resident Gardener at the 200 West Area Point of Analysis from Radionuclides in the Groundwater Over 10,000 Years – Alternative Group C, Lower Bound Volumes

Waste Category	Source Location	Exposure Scenario	Maximum Annual Dose		Lifetime Dose, rem	Probability of an LCF[b]
			Years Post-2046[a]	Dose, rem		
Previously Disposed Low Level Waste						
Pre-1970	200 West Area	Resident Gardener	190	1.2E-05	3.6E-04	2.2E-07
	200 West Area	Resident Gardener + Sauna	190	5.0E-05	1.5E-03	9.1E-07
1970 – 1988	200 West Area	Resident Gardener	290	1.8E-05	5.5E-04	3.3E-07
	200 West Area	Resident Gardener + Sauna	290	2.7E-05	8.1E-04	4.9E-07
1988 – 1995	200 West Area	Resident Gardener	250	3.3E-04	9.9E-03	6.0E-06
	200 West Area	Resident Gardener + Sauna	250	4.8E-04	1.5E-02	8.7E-06
Newly Generated Waste (1996 – 2007)						
LLW Cat 1	200 West Area	Resident Gardener	1700	3.3E-05	1.0E-03	6.0E-07
LLW Cat 3	200 West Area	Resident Gardener	1230	2.4E-05	7.3E-04	4.4E-07
MLLW	200 West Area	Resident Gardener	1700	3.4E-04	1.0E-02	6.2E-06
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1700	9.3E-05	2.8E-03	1.7E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	1.2E-04	3.5E-03	2.1E-06
MLLW	200 West Area	Resident Gardener + Sauna	1700	9.2E-04	2.8E-02	1.7E-05
Projected New Waste (> 2007)[c]						
LLW Cat 1	200 West Area	Resident Gardener	1910	5.9E-05	1.8E-03	1.1E-06
LLW Cat 3	200 West Area	Resident Gardener	1230	1.2E-03	3.5E-02	2.1E-05
LLW Cat 1	200 West Area	Resident Gardener + Sauna	1910	2.2E-04	6.5E-03	3.9E-06
LLW Cat 3	200 West Area	Resident Gardener + Sauna	1230	5.3E-03	1.6E-01	9.6E-05

(a) The number of years post-2046 in which the maximum annual dose occurs over the 10,000-yr period.
(b) Health impacts are expressed as lifetime risk of fatal cancer from the indicated lifetime radiation dose. The probability of an LCF is the calculated value using the appropriate linear health effects conversion factor. The actual probability cannot be greater than one.
(c) Results are not reported for cases that had no inventory reported for the waste.