



Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

NUCLIDE	CURIE/YEAR	BONE	LIVER	TOTAL BODY	(MREM/PCI INTAKE)			LUNG	GI-LLI	(MREM/HR) / (PCI/M**2)		
					THYROID	KIDNEY				SKIN	TOTAL BODY	RECON
1H	3	1.66E+03	.00E+00	5.99E-08	5.99E-08	5.99E-08	5.99E-08	5.99E-08	5.99E-08	.00E+00	.00E+00	1.00E+00
11NA	24	5.72E-03	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	2.90E-08	2.50E-08	1.00E+00
24CR	51	9.60E-04	.00E+00	2.66E-09	1.59E-09	5.86E-10	3.53E-09	6.69E-07	2.60E-10	2.20E-10	1.00E+00	1.00E+00
25MN	54	5.10E-04	.00E+00	4.57E-06	8.72E-07	.00E+00	1.36E-06	.00E+00	1.40E-05	6.80E-09	5.80E-09	1.00E+00
26FE	55	3.80E-04	2.75E-06	1.90E-06	4.43E-07	.00E+00	.00E+00	1.06E-06	1.09E-06	.00E+00	.00E+00	1.00E+00
26FE	59	9.00E-05	4.34E-06	1.02E-05	3.91E-06	.00E+00	.00E+00	2.85E-06	3.40E-05	9.40E-09	8.00E-09	1.00E+00
27CO	58	1.44E-03	.00E+00	7.45E-07	1.67E-06	.00E+00	.00E+00	.00E+00	1.51E-05	8.20E-09	7.00E-09	1.00E+00
27CO	60	1.70E-04	.00E+00	2.14E-06	4.72E-06	.00E+00	.00E+00	.00E+00	4.02E-05	2.00E-08	1.70E-08	1.00E+00
30ZN	65	1.60E-04	4.84E-06	1.54E-05	6.96E-06	.00E+00	1.03E-05	.00E+00	9.70E-06	4.60E-09	4.00E-09	1.00E+00
74W	187	4.30E-04	1.03E-07	8.61E-08	3.01E-08	.00E+00	.00E+00	.00E+00	2.82E-05	3.60E-09	3.10E-09	1.00E+00
93NP	239	5.40E-04	1.19E-09	1.17E-10	6.45E-11	.00E+00	3.65E-10	.00E+00	2.40E-05	1.10E-09	9.50E-10	1.00E+00
38SR	89	4.00E-05	3.08E-04	.00E+00	8.84E-06	.00E+00	.00E+00	.00E+00	4.94E-05	6.50E-13	5.60E-13	1.00E+00
38SR	91	7.00E-05	5.67E-06	.00E+00	2.29E-07	.00E+00	.00E+00	.00E+00	2.70E-05	8.30E-09	7.10E-09	1.00E+00
39Y	91M	5.00E-05	9.09E-11	.00E+00	3.52E-12	.00E+00	.00E+00	.00E+00	2.67E-10	4.40E-09	3.80E-09	1.00E+00
39Y	93	3.30E-04	2.68E-09	.00E+00	7.40E-11	.00E+00	.00E+00	.00E+00	8.50E-05	7.80E-10	5.70E-10	1.00E+00
40ZR	95	1.20E-04	3.04E-08	9.75E-09	6.60E-09	.00E+00	1.53E-08	.00E+00	3.09E-05	5.80E-09	5.00E-09	1.00E+00
41NB	95	9.00E-05	6.22E-09	3.46E-09	1.86E-09	.00E+00	3.42E-09	.00E+00	2.10E-05	6.00E-09	5.10E-09	1.00E+00
42MO	99	1.63E-03	.00E+00	4.31E-06	8.20E-07	.00E+00	9.76E-06	.00E+00	9.99E-06	2.20E-09	1.90E-09	1.00E+00
43TC	99M	1.59E-03	2.47E-10	6.98E-10	8.89E-09	.00E+00	1.06E-08	3.42E-10	4.13E-07	1.10E-09	9.60E-10	1.00E+00
44RU	103	2.34E-03	1.85E-07	.00E+00	7.97E-08	.00E+00	7.06E-07	.00E+00	2.16E-05	4.20E-09	3.60E-09	1.00E+00
44RU	106	2.84E-02	2.75E-06	.00E+00	3.48E-07	.00E+00	5.31E-06	.00E+00	1.78E-04	1.80E-09	1.50E-09	1.00E+00
47AG	110M	4.10E-04	1.60E-07	1.48E-07	8.79E-08	.00E+00	2.91E-07	.00E+00	6.04E-05	2.10E-08	1.80E-08	1.00E+00
52TE	129M	6.00E-05	1.15E-05	4.29E-06	1.82E-06	3.95E-06	4.80E-05	.00E+00	5.79E-05	9.00E-10	7.70E-10	1.00E+00
52TE	129	4.00E-05	3.14E-08	1.18E-08	7.65E-09	2.41E-08	1.32E-07	.00E+00	2.37E-08	8.40E-10	7.10E-10	1.00E+00
52TE	131M	2.90E-04	1.73E-06	8.46E-07	7.05E-07	1.34E-06	8.57E-06	.00E+00	8.40E-05	9.90E-09	8.40E-09	1.00E+00
52TE	131	5.00E-05	1.97E-08	8.23E-09	6.22E-09	1.62E-08	8.63E-08	.00E+00	2.79E-09	2.60E-06	2.20E-09	1.00E+00
53I	131	3.54E-02	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	.00E+00	1.57E-06	3.40E-09	2.80E-09	1.00E+00
52TE	132	4.50E-04	2.52E-06	1.63E-06	1.53E-06	1.80E-06	1.57E-05	.00E+00	7.71E-05	2.00E-09	1.70E-09	1.00E+00
53I	132	1.14E-03	2.03E-07	5.43E-07	1.90E-07	1.90E-05	8.65E-07	.00E+00	1.02E-07	2.00E-08	1.70E-08	1.00E+00
53I	133	4.21E-02	1.42E-06	2.47E-06	7.53E-07	3.63E-04	4.31E-06	.00E+00	2.22E-06	4.50E-09	3.70E-09	1.00E+00
55CS	134	2.45E-03	6.22E-05	1.48E-04	1.21E-04	.00E+00	4.79E-05	1.59E-05	2.59E-06	1.40E-08	1.20E-08	1.00E+00
53I	135	1.69E-02	4.43E-07	1.16E-06	4.28E-07	7.65E-05	1.86E-06	.00E+00	1.31E-06	1.40E-08	1.20E-08	1.00E+00
55CS	136	2.90E-04	6.51E-06	2.57E-05	1.85E-05	.00E+00	1.43E-05	1.96E-06	2.92E-06	1.70E-08	1.50E-08	1.00E+00
55CS	137	3.25E-03	7.97E-05	1.09E-04	7.14E-05	.00E+00	3.70E-05	1.23E-05	2.11E-06	4.90E-09	4.20E-09	1.00E+00
56BA	140	3.93E-03	2.03E-05	2.55E-08	1.33E-06	.00E+00	8.67E-09	1.46E-08	4.18E-05	2.40E-09	2.10E-09	1.00E+00
57LA	140	7.12E-03	2.50E-09	1.26E-09	3.33E-10	.00E+00	.00E+00	.00E+00	9.25E-05	1.70E-08	1.50E-08	1.00E+00
58CE	141	5.00E-05	9.36E-09	6.33E-09	7.18E-10	.00E+00	2.94E-09	.00E+00	2.42E-05	6.20E-10	5.50E-10	1.00E+00
58CE	143	5.70E-04	1.65E-09	1.22E-06	1.35E-10	.00E+00	5.37E-10	.00E+00	4.56E-05	2.50E-09	2.20E-09	1.00E+00
59PR	143	5.00E-05	9.20E-09	3.69E-09	4.56E-10	.00E+00	2.13E-09	.00E+00	4.03E-05	.00E+00	.00E+00	1.00E+00
58CE	144	1.23E-03	4.88E-07	2.04E-07	2.62E-08	.00E+00	1.21E-07	.00E+00	1.65E-04	3.70E-10	3.20E-10	1.00E+00
59PR	144	1.23E-03	3.01E-11	1.25E-11	1.53E-12	.00E+00	7.05E-12	.00E+00	4.33E-18	2.30E-10	2.00E-10	1.00E+00
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NUCLIDE	CURIE/YEAR	BONE	LIVER	TOTAL BODY	(MREM/PCI INTAKE)			LUNG	GI-LLI	SHORELINE (MREM/HR) / (PCI/M**2)		
					THYROID	KIDNEY				SKIN	TOTAL BODY	RECON

Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

NUCLIDE	CURIE/YEAR	BONE	LIVER	TOTAL BODY	INGESTION DOSE FACTORS (MREM/PCI INTAKE)				SHORELINE (MREM/HR) / (PCI/M**2)			
					THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON	
1H	3	1.66E+03	.00E+00	6.04E-08	6.04E-08	6.04E-08	6.04E-08	6.04E-08				
11NA	24	5.72E-03	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06				
24CR	51	9.60E-04	.00E+00	3.60E-09	2.00E-09	7.89E-10	5.14E-09	6.05E-07				
25MN	54	5.10E-04	.00E+00	5.90E-06	1.17E-06	.00E+00	1.76E-06	.00E+00				
26FE	55	3.80E-04	3.78E-06	2.68E-06	6.25E-07	.00E+00	.00E+00	1.70E-06				
26FE	59	9.00E-05	5.87E-06	1.37E-05	5.29E-06	.00E+00	.00E+00	4.32E-06				
27CO	58	1.44E-03	.00E+00	9.72E-07	2.24E-06	.00E+00	.00E+00	.00E+00				
27CO	60	1.70E-04	.00E+00	2.81E-06	6.33E-06	.00E+00	.00E+00	.00E+00				
30ZN	65	1.60E-04	5.76E-06	2.00E-05	9.33E-06	.00E+00	1.28E-05	.00E+00				
74W	187	4.30E-04	1.46E-07	1.19E-07	4.17E-08	.00E+00	.00E+00	.00E+00				
93NP	239	5.40E-04	1.76E-09	1.66E-10	9.22E-11	.00E+00	5.21E-10	.00E+00				
38SR	89	4.00E-05	4.40E-04	.00E+00	1.26E-05	.00E+00	.00E+00	.00E+00				
38SR	91	7.00E-05	8.07E-06	.00E+00	3.21E-07	.00E+00	.00E+00	.00E+00				
39Y	91M	5.00E-05	1.29E-10	.00E+00	4.93E-12	.00E+00	.00E+00	.00E+00				
39Y	93	3.30E-04	3.83E-09	.00E+00	1.05E-10	.00E+00	.00E+00	.00E+00				
40ZR	95	1.20E-04	4.12E-08	1.30E-08	8.94E-09	.00E+00	1.91E-08	.00E+00				
41NB	95	9.00E-05	8.22E-09	4.56E-09	2.51E-09	.00E+00	4.42E-09	.00E+00				
42MO	99	1.63E-03	.00E+00	6.03E-06	1.15E-06	.00E+00	1.38E-05	.00E+00				
43TC	99M	1.59E-03	3.32E-10	9.26E-10	1.20E-08	.00E+00	1.38E-08	5.14E-10				
44RU	103	2.34E-03	2.55E-07	.00E+00	1.09E-07	.00E+00	8.99E-07	.00E+00				
44RU	106	2.84E-02	3.92E-06	.00E+00	4.94E-07	.00E+00	7.56E-06	.00E+00				
47AG	110M	4.10E-04	2.05E-07	1.94E-07	1.18E-07	.00E+00	3.70E-07	.00E+00				
52TE	129M	6.00E-05	1.63E-05	6.05E-06	2.58E-06	5.26E-06	6.82E-05	.00E+00				
52TE	129	4.00E-05	4.48E-08	1.67E-08	1.09E-08	3.20E-08	1.88E-07	.00E+00				
52TE	131M	2.90E-04	2.44E-06	1.17E-06	9.76E-07	1.76E-06	1.22E-05	.00E+00				
52TE	131	5.00E-05	2.79E-08	1.15E-08	8.72E-09	2.15E-08	1.22E-07	.00E+00				
53I	131	3.54E-02	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	.00E+00				
52TE	132	4.50E-04	3.49E-06	2.21E-06	2.08E-06	2.33E-06	2.12E-05	.00E+00				
53I	132	1.14E-03	2.79E-07	7.30E-07	2.62E-07	2.46E-05	1.15E-06	.00E+00				
53I	133	4.21E-02	2.01E-06	3.41E-06	1.04E-06	4.76E-04	5.98E-06	.00E+00				
55CS	134	2.45E-03	8.37E-05	1.97E-04	9.14E-05	.00E+00	6.26E-05	2.39E-05				
53I	135	1.69E-02	6.10E-07	1.57E-06	5.82E-07	1.01E-04	2.48E-06	.00E+00				
55CS	136	2.90E-04	8.59E-06	3.38E-05	2.27E-05	.00E+00	1.84E-05	2.90E-06				
55CS	137	3.25E-03	1.12E-04	1.49E-04	5.19E-05	.00E+00	5.07E-05	1.97E-05				
56BA	140	3.93E-03	2.84E-05	3.48E-08	1.83E-06	.00E+00	1.18E-08	2.34E-08				
57LA	140	7.12E-03	3.48E-09	1.71E-09	4.55E-10	.00E+00	.00E+00	.00E+00				
58CE	141	5.00E-05	1.33E-08	8.88E-09	1.02E-09	.00E+00	4.18E-09	.00E+00				
58CE	143	5.70E-04	2.35E-09	1.71E-06	1.91E-10	.00E+00	7.67E-10	.00E+00				
59PR	143	5.00E-05	1.31E-08	5.23E-09	6.52E-10	.00E+00	3.04E-09	.00E+00				
58CE	144	1.23E-03	6.96E-07	2.88E-07	3.74E-08	.00E+00	1.72E-07	.00E+00				
59PR	144	1.23E-03	4.30E-11	1.76E-11	2.18E-12	.00E+00	1.01E-11	.00E+00				
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Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

NUCLIDE	CURIE/YEAR	BONE	LIVER	TOTAL BODY	INGESTION DOSE FACTORS				LUNG	GI-LLI	SHORELINE		
					(MREM/PCI INTAKE)						SKIN	TOTAL BODY	RECON
					(MREM/HR) / (PCI/M**2)								
24CR	51	9.60E-04	.00E+00	.00E+00	8.90E-09	4.94E-09	1.35E-09	9.02E-09	4.72E-07				
25MN	54	5.10E-04	.00E+00	1.07E-05	2.85E-06	.00E+00	3.00E-06	.00E+00	8.98E-06				
26FE	55	3.80E-04	1.15E-05	6.10E-06	1.89E-06	.00E+00	.00E+00	3.45E-06	1.13E-06				
26FE	59	9.00E-05	1.65E-05	2.67E-05	1.33E-05	.00E+00	.00E+00	7.74E-06	2.78E-05				
27CO	58	1.44E-03	.00E+00	1.80E-06	5.51E-06	.00E+00	.00E+00	.00E+00	1.05E-05				
27CO	60	1.70E-04	.00E+00	5.29E-06	1.56E-05	.00E+00	.00E+00	.00E+00	2.93E-05				
30ZN	65	1.60E-04	1.37E-05	3.65E-05	2.27E-05	.00E+00	2.30E-05	.00E+00	6.41E-06				
74W	187	4.30E-04	4.29E-07	2.54E-07	1.14E-07	.00E+00	.00E+00	.00E+00	3.57E-05				
93NP	239	5.40E-04	5.25E-09	3.77E-10	2.65E-10	.00E+00	1.09E-09	.00E+00	2.79E-05				
38SR	89	4.00E-05	1.32E-03	.00E+00	3.77E-05	.00E+00	.00E+00	.00E+00	5.11E-05				
38SR	91	7.00E-05	2.40E-05	.00E+00	9.06E-07	.00E+00	.00E+00	.00E+00	5.30E-05				
39Y	91M	5.00E-05	3.82E-10	.00E+00	1.39E-11	.00E+00	.00E+00	.00E+00	7.48E-07				
39Y	93	3.30E-04	1.14E-08	.00E+00	3.13E-10	.00E+00	.00E+00	.00E+00	1.70E-04				
40ZR	95	1.20E-04	1.16E-07	2.55E-08	2.27E-08	.00E+00	3.65E-08	.00E+00	2.66E-05				
41NB	95	9.00E-05	2.25E-08	8.76E-09	6.26E-09	.00E+00	8.23E-09	.00E+00	1.62E-05				
42MO	99	1.63E-03	.00E+00	1.33E-05	3.29E-06	.00E+00	2.84E-05	.00E+00	1.10E-05				
43TC	99M	1.59E-03	9.23E-10	1.81E-09	3.00E-08	.00E+00	2.63E-08	9.19E-10	1.03E-06				
44RU	103	2.34E-03	7.31E-07	.00E+00	2.81E-07	.00E+00	1.84E-06	.00E+00	1.89E-05				
44RU	106	2.84E-02	1.17E-05	.00E+00	1.46E-06	.00E+00	1.58E-05	.00E+00	1.82E-04				
47AG	110M	4.10E-04	5.39E-07	3.64E-07	2.91E-07	.00E+00	6.78E-07	.00E+00	4.33E-05				
52TE	129M	6.00E-05	4.87E-05	1.36E-05	7.56E-06	1.57E-05	1.43E-04	.00E+00	5.94E-05				
52TE	129	4.00E-05	1.34E-07	3.74E-08	3.18E-08	9.56E-08	3.92E-07	.00E+00	8.34E-06				
52TE	131M	2.90E-04	7.20E-06	2.49E-06	2.65E-06	5.12E-06	2.41E-05	.00E+00	1.01E-04				
52TE	131	5.00E-05	8.30E-08	2.53E-08	2.47E-08	6.35E-08	2.51E-07	.00E+00	4.36E-07				
53I	131	3.54E-02	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	.00E+00	1.54E-06				
52TE	132	4.50E-04	1.01E-05	4.47E-06	5.40E-06	6.51E-06	4.15E-05	.00E+00	4.50E-05				
53I	132	1.14E-03	8.00E-07	1.47E-06	6.76E-07	6.82E-05	2.25E-06	.00E+00	1.73E-06				
53I	133	4.21E-02	5.92E-06	7.32E-06	2.77E-06	1.36E-03	1.22E-05	.00E+00	2.95E-06				
55CS	134	2.45E-03	2.34E-04	3.84E-04	8.10E-05	.00E+00	1.19E-04	4.27E-05	2.07E-06				
53I	135	1.69E-02	1.75E-06	3.15E-06	1.49E-06	2.79E-04	4.83E-06	.00E+00	2.40E-06				
55CS	136	2.90E-04	2.35E-05	6.46E-05	4.18E-05	.00E+00	3.44E-05	5.13E-06	2.27E-06				
55CS	137	3.25E-03	3.27E-04	3.13E-04	4.62E-05	.00E+00	1.02E-04	3.67E-05	1.96E-06				
56BA	140	3.93E-03	8.31E-05	7.28E-08	4.85E-06	.00E+00	2.37E-08	4.34E-08	4.21E-05				
57LA	140	7.12E-03	1.01E-08	3.53E-09	1.19E-09	.00E+00	.00E+00	.00E+00	9.84E-05				
58CE	141	5.00E-05	3.97E-08	1.98E-08	2.94E-09	.00E+00	8.68E-09	.00E+00	2.47E-05				
58CE	143	5.70E-04	6.99E-09	3.79E-06	5.49E-10	.00E+00	1.59E-09	.00E+00	5.55E-05				
59PR	143	5.00E-05	3.93E-08	1.18E-08	1.95E-09	.00E+00	6.39E-09	.00E+00	4.24E-05				
58CE	144	1.23E-03	2.08E-06	6.52E-07	1.11E-07	.00E+00	3.61E-07	.00E+00	1.70E-04				
59PR	144	1.23E-03	1.29E-10	3.99E-11	6.49E-12	.00E+00	2.11E-11	.00E+00	8.59E-08				
0	0												



Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

OPATHWAY		S K I N				B O N E				L I V E R		D O S E S		D O S E (MREM PER YEAR INTAKE)				KIDNEY	LUNG	GI-LLI
		A	D	U	L	T	D	O	S	E	S	TOTAL BODY	THYROID							
FISH	26FE	55	3.80E-04	1.39E-05	8.98E-06	2.40E-06	.00E+00	.00E+00	.00E+00	.00E+00	4.39E-06	1.14E-06	.00E+00	6.07E-02	2.57E-02	2.80E-02				
INVERTEBRATE	26FE	59	9.00E-05	3.08E-05	5.38E-05	2.12E-05	.00E+00	.00E+00	.00E+00	.00E+00	1.59E-05	2.57E-05	.00E+00	1.28E-02	4.22E-03	8.11E-02				
	27CO	58	1.44E-03	.00E+00	3.60E-06	8.98E-06	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	8.97E-06	.00E+00	3.60E-01	3.57E-01	3.79E-01				
DRINKING	27CO	60	1.70E-04	.00E+00	1.08E-05	2.55E-05	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	2.57E-05	.00E+00	3.60E-01	3.57E-01	3.79E-01				
	30ZN	65	1.60E-04	1.84E-05	6.31E-05	2.91E-05	.00E+00	.00E+00	.00E+00	.00E+00	3.06E-05	.00E+00	5.33E-05	.00E+00	3.28E-05	3.28E-05				
SHORELINE	74W	187	4.30E-04	9.03E-07	6.28E-07	2.17E-07	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	3.69E-05	.00E+00	3.28E-05	3.28E-05	3.28E-05				
	93NP	239	5.40E-04	1.11E-08	9.93E-10	5.61E-10	.00E+00	.00E+00	.00E+00	.00E+00	1.98E-09	.00E+00	2.87E-05	.00E+00	3.78E-06	3.78E-06				
SWIMMING	38SR	89	4.00E-05	2.51E-03	.00E+00	7.20E-05	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	5.16E-05	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	38SR	91	7.00E-05	5.00E-05	.00E+00	1.81E-06	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	5.92E-05	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	39Y	91M	5.00E-05	8.10E-10	.00E+00	2.76E-11	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	2.70E-06	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	39Y	93	3.30E-04	2.43E-08	.00E+00	6.62E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	1.92E-04	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	40ZR	95	1.20E-04	2.06E-07	5.02E-08	3.56E-08	.00E+00	.00E+00	.00E+00	.00E+00	5.41E-08	.00E+00	2.50E-05	.00E+00	3.78E-06	3.78E-06				
	41NB	95	9.00E-05	4.20E-08	1.73E-08	1.00E-08	.00E+00	.00E+00	.00E+00	.00E+00	1.24E-08	.00E+00	1.46E-05	.00E+00	3.78E-06	3.78E-06				
	42MO	99	1.63E-03	.00E+00	3.40E-05	6.63E-06	.00E+00	.00E+00	.00E+00	.00E+00	5.08E-05	.00E+00	1.12E-05	.00E+00	3.78E-06	3.78E-06				
	44RU	103	2.34E-03	1.48E-06	.00E+00	4.95E-07	.00E+00	.00E+00	.00E+00	.00E+00	3.08E-06	.00E+00	1.80E-05	.00E+00	3.78E-06	3.78E-06				
	44RU	106	2.84E-02	2.41E-05	.00E+00	3.01E-06	.00E+00	.00E+00	.00E+00	.00E+00	2.85E-05	.00E+00	1.83E-04	.00E+00	3.78E-06	3.78E-06				
	47AG	110M	4.10E-04	9.96E-07	7.27E-07	4.81E-07	.00E+00	.00E+00	.00E+00	.00E+00	1.04E-06	.00E+00	3.77E-05	.00E+00	3.78E-06	3.78E-06				
	52TE	129M	6.00E-05	1.00E-04	3.43E-05	1.54E-05	3.84E-05	2.50E-04	.00E+00	.00E+00	5.97E-05	.00E+00	5.97E-05	.00E+00	3.78E-06	3.78E-06				
	52TE	129	4.00E-05	2.84E-07	9.79E-08	6.63E-08	2.38E-07	7.07E-07	.00E+00	.00E+00	2.27E-05	.00E+00	2.27E-05	.00E+00	3.78E-06	3.78E-06				
	52TE	131M	2.90E-04	1.52E-05	6.12E-06	5.05E-06	1.24E-05	4.21E-05	.00E+00	.00E+00	1.03E-04	.00E+00	1.03E-04	.00E+00	3.78E-06	3.78E-06				
	52TE	131	5.00E-05	1.76E-07	6.50E-08	4.94E-08	1.57E-07	4.50E-07	.00E+00	.00E+00	7.11E-06	.00E+00	7.11E-06	.00E+00	3.78E-06	3.78E-06				
	53I	131	3.54E-02	3.59E-05	4.23E-05	1.86E-05	1.39E-02	4.94E-05	.00E+00	.00E+00	1.51E-06	.00E+00	1.51E-06	.00E+00	3.78E-06	3.78E-06				
	52TE	132	4.50E-04	2.08E-05	1.03E-05	9.61E-06	1.52E-05	6.44E-05	.00E+00	.00E+00	3.81E-05	.00E+00	3.81E-05	.00E+00	3.78E-06	3.78E-06				
	53I	132	1.14E-03	1.66E-06	3.37E-06	1.20E-06	1.58E-04	3.76E-06	.00E+00	.00E+00	2.73E-06	.00E+00	2.73E-06	.00E+00	3.78E-06	3.78E-06				
	53I	133	4.21E-02	1.25E-05	1.82E-05	5.33E-06	3.31E-03	2.14E-05	.00E+00	.00E+00	3.08E-06	.00E+00	3.08E-06	.00E+00	3.78E-06	3.78E-06				
	55CS	134	2.45E-03	3.77E-04	7.03E-04	7.10E-05	.00E+00	1.81E-04	7.42E-05	1.91E-06	.00E+00	1.91E-06	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	53I	135	1.69E-02	3.64E-06	7.24E-06	2.64E-06	6.49E-04	8.07E-06	.00E+00	.00E+00	2.62E-06	.00E+00	2.62E-06	.00E+00	3.78E-06	3.78E-06				
	55CS	136	2.90E-04	4.59E-05	1.35E-04	5.04E-05	.00E+00	5.38E-05	1.10E-05	2.05E-06	.00E+00	2.05E-06	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	55CS	137	3.25E-03	5.22E-04	6.11E-04	4.33E-05	.00E+00	1.64E-04	6.64E-05	1.91E-06	.00E+00	1.91E-06	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	56BA	140	3.93E-03	1.71E-04	1.71E-07	8.81E-06	.00E+00	4.06E-08	1.05E-07	4.20E-05	.00E+00	4.20E-05	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	57LA	140	7.12E-03	2.11E-08	8.32E-09	2.14E-09	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	9.77E-05	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	58CE	141	5.00E-05	7.87E-08	4.80E-08	5.65E-09	.00E+00	1.48E-08	.00E+00	2.48E-05	.00E+00	2.48E-05	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	58CE	143	5.70E-04	1.48E-08	9.82E-06	1.12E-09	.00E+00	2.86E-09	.00E+00	5.73E-05	.00E+00	5.73E-05	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	59PR	143	5.00E-05	8.13E-08	3.04E-08	4.03E-09	.00E+00	1.13E-08	.00E+00	4.29E-05	.00E+00	4.29E-05	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	58CE	144	1.23E-03	2.98E-06	1.22E-06	1.67E-07	.00E+00	4.93E-07	.00E+00	1.71E-04	.00E+00	1.71E-04	.00E+00	3.78E-06	3.78E-06	3.78E-06				
	59PR	144	1.23E-03	2.74E-10	1.06E-10	1.38E-11	.00E+00	3.84E-11	.00E+00	4.93E-06	.00E+00	4.93E-06	.00E+00	3.78E-06	3.78E-06	3.78E-06				
TOTAL NUMBER		IN SOURCE TERM IS		41		TOTAL RELEASE IS 1.6602E+03		* * *		AS LOW AS REASONABLY ACHIEVABLE		* * *		DOSE (MREM PER YEAR INTAKE)		DOSE (MREM PER YEAR INTAKE)				
1																				
0																				
0																				



Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

DRINKING		9.29E-03	4.83E-01	4.76E-01	1.39E+00	4.81E-01	4.84E-01
SHORELINE	3.85E-05	3.28E-05	3.28E-05	3.28E-05	3.28E-05	3.28E-05	3.28E-05
SWIMMING		3.78E-06	3.78E-06	3.78E-06	3.78E-06	3.78E-06	3.78E-06
BOATING		3.05E-05	3.05E-05	3.05E-05	3.05E-05	3.05E-05	3.05E-05
TOTAL		9.36E-03	4.83E-01	4.76E-01	1.39E+00	4.81E-01	4.84E-01
0	USAGE (KG/YR,HR/YR)	DILUTION	TIME (HR)	SHOREWIDTH FACTOR= .2			
		11.8	24.00				
FISH		11.8	12.00				
DRINKING	330.0						
SHORELINE	12.0		.00				
SWIMMING	12.0		.00				
BOATING	52.0		.00				
1		* * *	FISH CONSUMPTION POPULATION DOSES	* * *			
			PERSON-REM				
0	SPORT HARVEST	-----DOSE (PERSON-REM)-----					
0							
OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY LUNG GI-LLI
FISH	ADULT	1.98E+05	5.42E-02	1.01E-01	7.55E-02	4.30E-02	3.79E-02 1.62E-02 1.51E-02
FISH	TEENAGER	2.31E+04	8.75E-03	1.56E-02	6.77E-03	6.00E-03	5.69E-03 2.57E-03 1.75E-03
FISH	CHILD	1.60E+04	1.74E-02	2.18E-02	4.74E-03	9.72E-03	7.69E-03 3.29E-03 1.57E-03
FISH	TOTAL	2.37E+05	8.03E-02	1.38E-01	8.70E-02	5.87E-02	5.12E-02 2.21E-02 1.85E-02
0	LOCATION	DILUTION	CATCH	TIME (HR)	-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR		
					POPULATION=4.03E+04		
SPORT Fishing Total	1.75E+02	2.37E+05	1.68E+02				
0AVERAGE INDIVIDUAL CONSUMPTION (KG/YR)		ADULT=6.90E+00	TEEN=5.20E+00	CHILD=2.20E+00			
1		* * *	FISH CONSUMPTION POPULATION DOSES	* * *			
			PERSON-REM				
0	COMMERCIAL HARVEST	-----DOSE (PERSON-REM)-----					
0							
OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY LUNG GI-LLI
FISH	ADULT	1.29E+07	1.41E-17	2.61E-17	1.96E-17	8.99E-18	9.82E-18 4.22E-18 3.84E-18
FISH	TEENAGER	1.51E+06	2.28E-18	4.06E-18	1.76E-18	1.25E-18	1.48E-18 6.68E-19 4.45E-19
FISH	CHILD	1.05E+06	4.53E-18	5.67E-18	1.23E-18	2.01E-18	2.00E-18 8.56E-19 4.03E-19
FISH	TOTAL	1.55E+07	2.09E-17	3.59E-17	2.26E-17	1.22E-17	1.33E-17 5.74E-18 4.69E-18
0	LOCATION	DILUTION	CATCH	TIME (HR)	-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR		
					POPULATION=2.64E+06		
Commercial Fishing-N	9.99E+02	1.00E-09	2.40E+02				
0AVERAGE INDIVIDUAL CONSUMPTION (KG/YR)		ADULT=6.90E+00	TEEN=5.20E+00	CHILD=2.20E+00			
0	NEPA DOSES	-----DOSE (PERSON-REM)-----					
0							
OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY LUNG GI-LLI
FISH	ADULT	1.98E+05	5.42E-02	1.01E-01	7.55E-02	4.30E-02	3.79E-02 1.62E-02 1.51E-02
FISH	TEENAGER	2.31E+04	8.75E-03	1.56E-02	6.77E-03	6.00E-03	5.69E-03 2.57E-03 1.75E-03
FISH	CHILD	1.60E+04	1.74E-02	2.18E-02	4.74E-03	9.72E-03	7.69E-03 3.29E-03 1.57E-03
FISH	TOTAL	2.37E+05	8.03E-02	1.38E-01	8.70E-02	5.87E-02	5.12E-02 2.21E-02 1.85E-02
1		* * *	INVERTEBRATE CONSUMPTION POPULATION DOSES	* * *			
			PERSON-REM				
0	SPORT HARVEST	-----DOSE (PERSON-REM)-----					
0							

Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	ADULT	8.33E-10	2.25E-17	5.07E-17	3.28E-17	1.36E-17	2.31E-17	8.25E-18	1.27E-16
INVER	TEENAGER	9.68E-11	3.62E-18	7.70E-18	3.17E-18	1.83E-18	3.44E-18	1.21E-18	1.48E-17
INVER	CHILD	6.97E-11	7.49E-18	1.09E-17	2.93E-18	2.98E-18	4.78E-18	1.63E-18	1.01E-17
INVER	TOTAL	1.00E-09	3.36E-17	6.93E-17	3.89E-17	1.84E-17	3.14E-17	1.11E-17	1.52E-16
0	LOCATION	DILUTION	CATCH	TIME(HR)	-INCLUDES FOOD PROCESSING TIME OF 1.68E+02	TEEN=7.50E-01	CHILD=3.30E-01	POPULATION=1.17E-09	
	Sport Invert-NONE	9.99E+02	1.00E-09	1.68E+02					
0AVERAGE	INDIVIDUAL CONSUMPTION (KG/YR)		*	*	INVERSE RATE CONSUMPTION POPULATION DOSES	*	*	*	
1					PERSON-REM				
0	COMMERCIAL HARVEST								
0									
OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	ADULT	1.87E+06	2.18E-17	4.94E-17	3.19E-17	1.12E-17	2.23E-17	8.05E-18	1.21E-16
INVER	TEENAGER	2.18E+05	3.51E-18	7.50E-18	3.09E-18	1.49E-18	3.30E-18	1.19E-18	1.41E-17
INVER	CHILD	1.57E+05	7.27E-18	1.07E-17	2.84E-18	2.40E-18	4.60E-18	1.59E-18	9.61E-18
INVER	TOTAL	2.25E+06	3.26E-17	6.75E-17	3.79E-17	1.51E-17	3.02E-17	1.08E-17	1.45E-16
0	LOCATION	DILUTION	CATCH	TIME(HR)	-INCLUDES FOOD PROCESSING TIME OF 2.40E+02	TEEN=7.50E-01	CHILD=3.30E-01	POPULATION=2.64E+06	
	Commercial Invert-No	9.99E+02	1.00E-09	2.40E+02					
0AVERAGE	INDIVIDUAL CONSUMPTION (KG/YR)				TEEN=7.50E-01	CHILD=3.30E-01			
0	NEPA DOSES								
0NOTE--TOTAL NEPA DOSE INCLUDES SPORT CATCH									
0									
OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	ADULT	1.67E-09	4.48E-17	1.01E-16	6.54E-17	2.50E-17	4.59E-17	1.65E-17	2.51E-16
INVER	TEENAGER	1.94E-10	7.20E-18	1.54E-17	6.33E-18	3.35E-18	6.82E-18	2.43E-18	2.92E-17
INVER	CHILD	1.39E-10	1.49E-17	2.18E-17	5.83E-18	5.44E-18	9.49E-18	3.26E-18	1.99E-17
INVER	TOTAL	2.00E-09	6.70E-17	1.38E-16	7.76E-17	3.38E-17	6.22E-17	2.22E-17	3.00E-16
1		*	*	*	POPULATION WATER CONSUMPTION DOSES	*	*	*	
0									
0SUPPLIER-Danville MWA									
0									
OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	ADULT	1.29E+06	1.02E-04	1.50E-02	1.49E-02	2.25E-02	1.49E-02	1.48E-02	1.57E-02
DRINKING	TEENAGER	1.40E+05	1.55E-05	1.65E-03	1.64E-03	2.65E-03	1.64E-03	1.63E-03	1.73E-03
DRINKING	CHILD	2.29E+05	7.35E-05	5.18E-03	5.13E-03	9.14E-03	5.16E-03	5.12E-03	5.27E-03
DRINKING	TOTAL	1.66E+06	1.91E-04	2.17E-02	2.17E-02	3.43E-02	2.17E-02	2.16E-02	2.27E-02
0POPULATION=4.90E+03		DILUTION=5.00E+02		TRANSIT TIME=8.70E+01	HR (INCLUDING 24 HR FOR TREATMENT FACILITY)				
0AVERAGE	INDIVIDUAL CONSUMPTION (L/YR)			ADULT=3.70E+02	TEEN=2.60E+02	CHILD=2.60E+02			
0									
0SUPPLIER-Sunbury MWA									
0									
OPATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	ADULT	2.90E+06	2.30E-04	3.37E-02	3.36E-02	5.07E-02	3.37E-02	3.35E-02	3.54E-02
DRINKING	TEENAGER	3.16E+05	3.49E-05	3.71E-03	3.69E-03	5.98E-03	3.70E-03	3.67E-03	3.89E-03
DRINKING	CHILD	5.17E+05	1.66E-04	1.17E-02	1.16E-02	2.06E-02	1.16E-02	1.15E-02	1.19E-02
DRINKING	TOTAL	3.73E+06	4.30E-04	4.91E-02	4.89E-02	7.73E-02	4.90E-02	4.87E-02	5.11E-02



Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

OPOPULATION=1.10E+04 DILUTION=5.00E+02 TRANSIT TIME=8.70E+01 HR (INCLUDING 24 HR FOR TREATMENT FACILITY)									
O AVERAGE INDIVIDUAL CONSUMPTION (L/YR) ADULT=3.70E+02 TEEN=2.60E+02 CHILD=2.60E+02									
0-----CUMULATIVE TOTAL-----									
OPATHWAY AGE GROUP USAGE BONE LIVER TOTAL BODY THYROID KIDNEY LUNG GI-LLI									
DRINKING CUMUL TOTAL 5.39E+06 6.21E-04 7.09E-02 7.06E-02 1.12E-01 7.07E-02 7.03E-02 7.38E-02									
0 HYDROSPHERE TRITIUM DOSE									
O AVERAGE INDIVIDUAL WATER CONSUMPTION = 3.0 L/DAY									
OPATHWAY AGE GROUP USAGE BONE LIVER TOTAL BODY THYROID KIDNEY LUNG GI-LLI									
WATER TOTAL 2.86E+11 .00E+00 1.27E-02 1.27E-02 1.27E-02 1.27E-02 1.27E-02 1.27E-02									
1 * * * RECREATION POPULATION DOSES * * *									
0 LOCATION- Shoreline-none									
ODILUTION= 9.99E+02 TRANSIT TIME= 9.99E+02 HR SWF= .2									
0 OPATHWAY AGE GROUP USAGE SKIN TOTAL BODY THYROID									
SHORELINE TOTAL POPUL 1.00E-09 1.35E-19 1.15E-19 1.15E-19									
0 LOCATION- Swimming-none									
ODILUTION= 9.99E+02 TRANSIT TIME= 9.99E+02 HR									
0 OPATHWAY AGE GROUP USAGE SKIN TOTAL BODY THYROID									
SWIMMING TOTAL POPUL 1.00E-09 1.61E-21 1.61E-21									
0 LOCATION- Boating									
ODILUTION= 1.75E+02 TRANSIT TIME= 2.90E+02 HR									
0 OPATHWAY AGE GROUP USAGE SKIN TOTAL BODY THYROID									
BOATING TOTAL POPUL 5.65E+05 3.80E-06 3.80E-06									
1 * * * COST-BENEFIT ANALYSIS * * *									
0 NUCLEIDE RELEASE PERSON-REM DOSE PERSON-REM PER CURIE									
CI/YR TOTAL BODY THYROID TOTAL BODY THYROID									
1H 3 1.66E+03 7.77E-02 7.77E-02 4.68E-05 4.68E-05									
11NA 24 5.72E-03 1.90E-07 1.90E-07 3.32E-05 3.32E-05									
24CR 51 9.60E-04 4.55E-08 2.80E-08 4.74E-05 2.92E-05									
25MN 54 5.10E-04 1.67E-05 6.97E-08 3.28E-02 1.37E-04									
26FE 55 3.80E-04 1.81E-06 2.26E-12 4.77E-03 5.94E-09									
26FE 59 9.00E-05 3.26E-06 1.53E-08 3.62E-02 1.71E-04									
27CO 58 1.44E-03 1.26E-05 2.15E-07 8.77E-03 1.50E-04									
27CO 60 1.70E-04 4.48E-06 7.28E-08 2.63E-02 4.28E-04									
30ZN 65 1.60E-04 2.04E-04 1.59E-08 1.27E+00 9.94E-05									
74W 187 4.30E-04 1.24E-08 7.48E-12 2.88E-05 1.74E-08									
93NP 239 5.40E-04 3.64E-10 3.48E-10 6.74E-07 6.45E-07									
38SR 89 4.00E-05 1.27E-06 1.46E-11 3.16E-02 3.64E-07									
38SR 91 7.00E-05 2.53E-11 .00E+00 3.61E-07 .00E+00									
39Y 91M .00E+05 .00E+00 .00E+00 .00E+00 .00E+00									
39Y 93 3.30E-04 5.77E-14 1.28E-17 1.75E-10 3.89E-14									



Annual Offsite Dose to Individuals and Populations from Liquid Effluent Releases from the U.S. EPR at BBNPP

40ZR	95	1.20E-04	1.57E-08	1.48E-08	1.30E-04	1.23E-04
41NB	95	9.00E-05	4.19E-07	9.29E-09	4.65E-03	1.03E-04
42MO	99	1.63E-03	7.12E-07	3.40E-09	4.37E-04	2.09E-06
43TC	99M	1.59E-03	5.33E-13	.00E+00	3.35E-10	.00E+00
44RU	103	2.34E-03	4.64E-07	1.57E-07	1.98E-04	6.73E-05
44RU	106	2.84E-02	1.97E-05	9.87E-07	6.92E-04	3.47E-05
47AG	110M	4.10E-04	2.19E-07	1.82E-07	5.35E-04	4.43E-04
52TE	129M	6.00E-05	3.81E-06	8.13E-06	6.35E-02	1.35E-01
52TE	129	4.00E-05	.00E+00	.00E+00	.00E+00	.00E+00
52TE	131M	2.90E-04	1.86E-07	3.52E-07	6.41E-04	1.22E-03
52TE	131	5.00E-05	.00E+00	.00E+00	.00E+00	.00E+00
53I	131	3.54E-02	1.62E-04	9.18E-02	4.56E-03	2.59E+00
52TE	132	4.50E-04	6.15E-06	7.24E-06	1.37E-02	1.61E-02
53I	132	1.14E-03	.00E+00	.00E+00	.00E+00	.00E+00
53I	133	4.21E-02	1.70E-06	8.22E-04	4.04E-05	1.95E-02
55CS	134	2.45E-03	4.42E-02	6.57E-07	1.80E+01	2.68E-04
53I	135	1.69E-02	6.63E-10	1.20E-07	3.92E-08	7.11E-06
55CS	136	2.90E-04	6.46E-04	5.87E-08	2.23E+00	2.02E-04
55CS	137	3.25E-03	3.47E-02	3.04E-07	1.07E+01	9.35E-05
56BA	140	3.93E-03	5.21E-06	9.36E-08	1.33E-03	2.38E-05
57LA	140	7.12E-03	1.93E-08	1.86E-08	2.72E-06	2.61E-06
58CE	141	5.00E-05	5.03E-10	4.70E-10	1.01E-05	9.40E-06
58CE	143	5.70E-04	8.21E-11	7.05E-11	1.44E-07	1.24E-07
59PR	143	5.00E-05	6.12E-11	4.04E-12	1.22E-06	8.08E-08
58CE	144	1.23E-03	4.24E-08	9.61E-09	3.44E-05	7.81E-06
59PR	144	1.23E-03	.00E+00	.00E+00	.00E+00	.00E+00
0	TOTAL	1.58E-01	1.70E-01			
1						
1						
1						

