

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Actinium (89)	Ac-223	1.73E+05	4.00E-06	1.13E+24	1.53E+24	5.75E+24	5.12E+00	2.24E+01	3.33E+00	.	8.46E+04	5.39E+04	4.26E+04	2.69E-01	
Actinium (89)	Ac-224	2.18E+03	3.17E-04	1.58E+01	4.86E+01	5.69E+02	2.02E-05	2.61E-05	1.26E-05	2.92E-04	1.13E-03	3.26E-04	2.89E-06	7.24E-04	
Actinium (89)	Ac-225	2.53E+01	2.74E-02	1.59E+00	4.47E+00	9.12E-01	8.02E-06	1.03E-05	4.99E-06	2.76E-04	2.33E-03	1.09E-03	3.85E-03	5.07E-03	
Actinium (89)	Ac-226	2.07E+02	3.35E-03	1.24E+00	5.32E+01	1.06E-01	5.72E-06	7.37E-06	3.56E-06	2.07E-05	1.56E-04	5.21E-05	5.18E-06	1.27E-03	
Actinium (89)	Ac-227	3.18E-02	2.18E+01	4.62E-04	5.64E-03	5.74E-07	1.08E-06	1.39E-06	6.70E-07	1.15E-04	8.29E-04	5.45E-05	1.91E-06	6.60E-04	
Actinium (89)	Ac-228	9.87E+02	7.02E-04	6.63E+00	2.18E+01	1.25E-02	1.59E-06	2.05E-06	9.88E-07	1.77E-04	8.63E-04	3.02E-05	2.56E-06	6.22E-04	
Actinium (89)	Ac-230	1.79E+05	3.87E-06	1.42E+06	1.59E+07	4.30E+03	2.47E-06	3.18E-06	1.53E-06	1.85E-05	1.38E-04	2.13E-05	1.16E-06	2.16E-04	
Actinium (89)	Ac-231	4.86E+04	1.43E-05	5.72E+05	3.10E+05	7.48E+02	7.94E-07	1.02E-06	4.94E-07	8.53E-05	6.25E-04	5.07E-05	1.91E-06	6.60E-04	
Actinium (89)	Ac-232	1.84E+05	3.77E-06	2.35E+11	2.10E+12	2.56E+08	9.93E-07	1.28E-06	6.17E-07	3.80E-05	2.50E-04	1.35E-05	3.86E-07	1.61E-04	
Actinium (89)	Ac-233	1.51E+05	4.60E-06	1.78E+04	3.04E+04	5.43E+03	8.92E-07	1.15E-06	5.54E-07	9.15E-05	7.36E-04	1.60E-05	1.89E-06	3.49E-03	
Silver (47)	Ag-100m	1.63E+05	4.26E-06	1.22E+03	1.90E+03	6.19E+02	2.97E-02	5.93E-02	1.89E-02	8.50E-03	4.67E-02	2.51E-02	6.08E-04	.	
Silver (47)	Ag-101	3.28E+04	2.11E-05	2.95E+03	4.54E+03	1.26E+03	6.58E-02	1.19E-01	4.16E-02	3.47E-02	2.11E-01	9.28E-02	1.44E-03	.	
Silver (47)	Ag-102	2.82E+04	2.45E-05	1.61E+18	2.19E+18	8.15E+18	9.74E-02	4.14E-01	6.33E-02	7.40E-01	3.15E+00	3.50E-01	1.20E+00	.	
Silver (47)	Ag-102m	4.73E+04	1.46E-05	2.23E+18	3.03E+18	1.13E+19	8.91E-02	3.84E-01	5.79E-02	1.51E+00	6.42E+00	7.15E-01	2.44E+00	.	
Silver (47)	Ag-103	5.54E+03	1.25E-04	2.36E+03	7.04E+05	2.04E+03	9.65E-02	1.48E-01	6.06E-02	3.79E-02	1.83E-01	7.52E-02	2.87E-02	2.63E+00	
Silver (47)	Ag-104	5.26E+03	1.32E-04	9.59E+13	1.31E+14	4.79E+14	1.23E-01	4.94E-01	7.96E-02	3.27E-01	1.40E+00	1.55E-01	5.30E-01	.	
Silver (47)	Ag-104m	1.09E+04	6.37E-05	8.45E+15	1.15E+16	4.20E+16	1.78E-01	7.02E-01	1.16E-01	3.95E-01	1.69E+00	1.87E-01	6.42E-01	.	
Silver (47)	Ag-105	6.13E+00	1.13E-01	2.67E-01	4.72E-01	6.64E-02	6.63E-02	9.14E-02	4.14E-02	3.06E-02	1.31E-01	1.45E-02	4.98E-02	4.22E+00	
Silver (47)	Ag-105m	5.04E+04	1.38E-05	2.20E+03	3.90E+03	5.49E+02	6.65E-02	9.17E-02	4.15E-02	3.07E-02	1.31E-01	1.45E-02	5.00E-02	4.23E+00	
Silver (47)	Ag-106	1.52E+04	4.56E-05	3.76E+17	5.13E+17	1.86E+18	4.81E-01	1.84E+00	3.11E-01	9.33E-01	3.99E+00	4.42E-01	1.52E+00	.	
Silver (47)	Ag-106m	3.05E+01	2.27E-02	2.38E-01	3.79E-01	8.07E-02	4.25E-02	7.25E-02	2.68E-02	1.13E-02	4.84E-02	5.36E-03	1.84E-02	.	
Silver (47)	Ag-108	1.54E+05	4.51E-06	2.93E+25	3.95E+25	1.49E+26	1.69E+01	7.40E+01	1.10E+01	.	2.90E+05	1.85E+05	1.10E+05	.	
Silver (47)	Ag-108m	1.66E-03	4.18E+02	4.74E-04	9.24E-04	6.86E-05	2.17E-03	2.81E-03	1.35E-03	6.76E-03	2.89E-02	3.20E-03	1.10E-02	.	
Silver (47)	Ag-109m	5.52E+05	1.26E-06	3.39E+29	4.53E+29	1.73E+30	1.11E+02	4.83E+02	7.18E+01	.	1.76E+06	1.12E+06	6.68E+05	.	
Silver (47)	Ag-110	8.88E+05	7.80E-07	2.82E+29	3.77E+29	1.44E+30	9.01E+00	3.94E+01	5.86E+00	.	1.56E+05	9.95E+04	5.94E+04	.	
Silver (47)	Ag-110m	1.01E+00	6.84E-01	7.21E-03	1.26E-02	1.87E-03	4.85E-03	6.43E-03	3.02E-03	5.41E-03	2.31E-02	2.56E-03	8.80E-03	1.27E+00	
Silver (47)	Ag-111	3.40E+01	2.04E-02	1.62E+00	4.99E+01	1.24E-01	3.10E-02	4.00E-02	1.93E-02	6.26E-03	2.69E-02	2.97E-03	1.02E-02	1.41E+00	
Silver (47)	Ag-111m	3.37E+05	2.05E-06	1.62E+04	5.00E+05	1.24E+03	3.12E-02	4.03E-02	1.94E-02	6.31E-03	2.71E-02	2.99E-03	1.03E-02	1.42E+00	
Silver (47)	Ag-112	1.94E+03	3.57E-04	1.29E+12	2.03E+12	3.65E+12	1.83E-01	3.24E-01	1.16E-01	2.64E-02	1.13E-01	1.25E-02	4.31E-02	.	
Silver (47)	Ag-113	1.13E+03	6.13E-04	3.57E+02	4.15E+06	4.68E+00	2.04E-03	2.63E-03	1.27E-03	2.34E-03	4.14E-03	1.03E-03	5.18E-06	.	
Silver (47)	Ag-113m	3.18E+05	2.18E-06	1.57E+05	1.82E+09	2.06E+03	2.05E-03	2.64E-03	1.27E-03	2.43E-03	4.21E-03	1.06E-03	5.19E-06	.	
Silver (47)	Ag-114	4.75E+06	1.46E-07	1.81E+33	2.42E+33	9.22E+33	1.19E+00	5.19E+00	7.72E-01	.	1.99E+04	1.26E+04	7.55E+03	.	
Silver (47)	Ag-115	1.82E+04	3.81E-05	1.70E+02	2.11E+03	2.99E+00	5.81E-04	7.50E-04	3.61E-04	1.35E-03	5.66E-03	4.47E-05	1.10E-05	3.99E-03	
Silver (47)	Ag-116	1.36E+05	5.10E-06	4.46E+22	6.01E+22	2.27E+23	1.48E-01	6.48E-01	9.64E-02	.	2.46E+03	1.57E+03	9.35E+02	.	
Silver (47)	Ag-117	2.97E+05	2.33E-06	4.89E+06	4.84E+07	2.55E+06	7.66E-02	1.95E-01	4.91E-02	3.00E-02	6.10E-02	2.84E-03	7.77E-05	.	
Silver (47)	Ag-99	1.76E+05	3.93E-06	2.36E+05	3.68E+05	9.63E+04	7.35E-02	2.62E-01	4.76E-02	1.32E-01	8.49E-01	4.46E-01	4.69E-03	.	
Aluminum (13)	Al-26	9.67E-07	7.17E+05	3.18E-04	4.87E-04	7.53E-05	7.86E-04	1.02E-03	4.89E-04	3.03E-03	2.50E-02	1.69E-04	3.76E-02	.	
Aluminum (13)	Al-28	1.63E+05	4.26E-06	3.67E+23	4.98E+23	1.87E+24	1.77E-01	7.74E-01	1.15E-01	.	2.93E+03	1.87E+03	4.40E+03	.	
Aluminum (13)	Al-29	5.55E+04	1.25E-05	2.48E+20	3.37E+20	1.26E+21	2.35E-01	1.03E+00	1.53E-01	.	3.89E+03	2.48E+03	5.83E+03	.	
Americium (95)	Am-237	4.99E+03	1.39E-04	4.80E+03	7.08E+03	6.58E-01	8.02E-07	1.03E-06	4.99E-07	8.31E-05	6.67E-04	8.47E-06	1.13E-06	2.09E-04	
Americium (95)	Am-238	3.72E+03	1.86E-04	8.79E+03	2.45E+05	1.01E-02	1.33E-06	1.71E-06	8.25E-07	1.73E-05	1.30E-04	3.12E-06	8.48E-07	2.01E-04	
Americium (95)	Am-239	5.10E+02	1.36E-03	8.08E+01	1.18E+02	3.17E-01	6.21E-07	8.00E-07	3.86E-07	6.53E-05	4.90E-04	3.32E-06	1.19E-06	3.91E-04	
Americium (95)	Am-240	1.20E+02	5.80E-03	2.82E+00	4.12E+00	1.18E-02	7.35E-07	9.47E-07	4.57E-07	3.34E-05	2.26E-04	2.81E-06	3.46E-07	1.52E-04	
Americium (95)	Am-241	1.60E-03	4.32E+02	1.78E-02	1.73E-01	1.75E-07	7.09E-07	9.13E-07	4.41E-07	7.25E-05	5.84E-04	7.12E-06	1.07E-06	1.92E-04	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Americium (95)	Am-242	3.79E+02	1.83E-03	2.30E+02	1.58E+03	7.82E-04	1.18E-06	1.53E-06	7.36E-07	1.71E-05	1.29E-04	2.85E-06	8.07E-07	1.64E-04	
Americium (95)	Am-242m	4.91E-03	1.41E+02	1.43E-02	1.16E-01	3.82E-08	1.01E-06	1.30E-06	6.26E-07	1.67E-05	1.26E-04	2.73E-06	7.86E-07	1.64E-04	
Americium (95)	Am-243	9.40E-05	7.37E+03	4.29E-03	9.58E-03	3.26E-08	5.65E-07	7.27E-07	3.51E-07	5.82E-05	4.42E-04	3.03E-06	1.09E-06	3.11E-04	
Americium (95)	Am-244	6.01E+02	1.15E-03	4.26E+02	1.91E+04	1.72E-03	6.60E-07	8.50E-07	4.10E-07	3.19E-05	2.17E-04	2.34E-06	3.41E-07	1.43E-04	
Americium (95)	Am-244m	1.40E+04	4.95E-05	9.93E+03	4.46E+05	4.02E-02	6.60E-07	8.50E-07	4.10E-07	3.20E-05	2.17E-04	2.35E-06	3.41E-07	1.43E-04	
Americium (95)	Am-245	2.96E+03	2.34E-04	2.13E+05	8.00E+05	1.43E+00	6.33E-07	8.15E-07	3.93E-07	6.40E-05	5.17E-04	4.30E-06	1.01E-06	1.76E-04	
Americium (95)	Am-246	9.34E+03	7.42E-05	8.56E+05	1.46E+07	2.98E+00	9.77E-07	1.26E-06	6.07E-07	1.64E-05	1.24E-04	2.44E-06	6.80E-07	1.06E-04	
Americium (95)	Am-246m	1.46E+04	4.76E-05	1.34E+06	2.28E+07	4.64E+00	9.77E-07	1.26E-06	6.07E-07	1.64E-05	1.24E-04	2.44E-06	6.80E-07	1.06E-04	
Americium (95)	Am-247	1.58E+04	4.38E-05	5.27E+08	1.12E+09	3.34E+03	5.20E-07	6.70E-07	3.23E-07	5.29E-05	4.05E-04	2.41E-06	1.03E-06	3.11E-04	
Argon (18)	Ar-37	7.22E+00	9.60E-02	.	.	.	.	.	.	.	.	.	.	.	
Argon (18)	Ar-39	2.58E-03	2.69E+02	8.26E+00	1.25E+01	2.81E+00	7.66E+02	3.34E+03	4.98E+02	.	2.01E+07	1.28E+07	.	.	
Argon (18)	Ar-41	3.32E+03	2.09E-04	1.09E+13	1.49E+13	5.58E+13	2.56E-01	1.12E+00	1.67E-01	.	4.25E+03	2.71E+03	.	.	
Argon (18)	Ar-42	2.11E-02	3.29E+01	2.27E-03	5.66E-03	5.04E-05	1.59E-01	2.27E-01	9.92E-02	4.33E-02	9.22E-02	2.64E-03	1.22E-03	4.40E-01	
Argon (18)	Ar-43	6.78E+04	1.02E-05	1.57E+03	2.61E+03	7.70E+05	8.20E-02	1.86E-01	5.24E-02	7.14E-02	1.52E-01	4.35E-03	2.00E-03	.	
Argon (18)	Ar-44	3.07E+04	2.26E-05	1.20E+17	1.64E+17	4.55E+17	7.22E-02	3.01E-01	4.69E-02	3.98E-01	8.47E-01	2.43E-02	1.12E-02	.	
Arsenic (33)	As-68	1.44E+05	4.81E-06	1.65E+03	5.61E+03	5.74E+01	2.15E-03	2.83E-03	1.34E-03	7.35E-03	1.61E-02	4.59E-04	4.09E-04	.	
Arsenic (33)	As-69	2.39E+04	2.90E-05	5.24E+02	8.74E+02	6.87E+01	1.06E-01	2.51E-01	6.81E-02	6.13E-02	1.39E-01	3.88E-03	5.00E-04	.	
Arsenic (33)	As-70	6.92E+03	1.00E-04	2.20E+14	3.00E+14	1.12E+15	7.52E-02	2.95E-01	4.88E-02	1.64E-01	8.68E-01	1.76E-02	1.74E-04	.	
Arsenic (33)	As-71	9.30E+01	7.45E-03	3.66E+00	6.27E+00	1.34E+00	1.14E-01	1.68E-01	7.13E-02	2.25E-02	1.15E-01	2.36E-03	2.46E-05	5.59E+00	
Arsenic (33)	As-72	2.33E+02	2.97E-03	2.64E+00	4.64E+00	1.44E+00	4.03E-02	6.09E-02	2.53E-02	5.01E-03	2.67E-02	5.37E-04	5.34E-06	.	
Arsenic (33)	As-73	3.15E+00	2.20E-01	1.32E+00	8.79E+01	9.82E-01	4.60E-02	5.93E-02	2.86E-02	3.29E-02	1.75E-01	3.53E-03	3.51E-05	7.40E-03	
Arsenic (33)	As-74	1.42E+01	4.87E-02	3.57E-01	6.88E-01	1.99E-01	2.27E-02	3.03E-02	1.42E-02	7.83E-03	4.16E-02	8.38E-04	8.33E-06	7.40E-04	
Arsenic (33)	As-76	2.35E+02	2.95E-03	7.40E+00	1.96E+01	4.44E+00	5.07E-02	6.82E-02	3.16E-02	5.37E-03	2.86E-02	5.75E-04	5.72E-06	4.44E-04	
Arsenic (33)	As-77	1.56E+02	4.43E-03	3.90E+01	7.46E+02	2.83E+01	1.23E-01	1.58E-01	7.62E-02	2.07E-02	1.11E-01	2.22E-03	2.21E-05	1.48E-03	
Arsenic (33)	As-78	4.02E+03	1.73E-04	1.36E+14	1.88E+14	6.99E+14	1.96E-01	5.54E-01	1.26E-01	8.93E-02	4.74E-01	9.56E-03	9.49E-05	.	
Arsenic (33)	As-79	4.04E+04	1.71E-05	5.73E+06	2.00E+11	3.02E+05	1.23E-02	1.59E-02	7.67E-03	8.21E-03	8.20E-03	2.91E-04	1.64E-03	.	
Astatine (85)	At-204	3.96E+04	1.75E-05	1.51E+04	2.22E+04	1.73E+06	3.46E-02	8.24E-02	2.21E-02	1.79E-02	1.00E-01	4.31E-02	3.74E-02	1.25E+03	
Astatine (85)	At-205	1.39E+04	4.98E-05	1.93E+02	3.03E+02	1.02E+02	2.10E-02	3.34E-02	1.32E-02	1.35E-02	6.92E-02	3.08E-02	9.00E-03	4.98E+02	
Astatine (85)	At-206	1.19E+04	5.82E-05	6.31E+01	9.95E+01	3.08E+01	9.68E-04	1.26E-03	6.02E-04	1.36E-03	9.80E-03	3.66E-03	2.00E-03	1.88E+00	
Astatine (85)	At-207	3.37E+03	2.05E-04	1.15E+02	2.00E+02	4.62E+01	2.06E-03	2.71E-03	1.28E-03	8.11E-03	3.89E-02	1.98E-02	2.55E-03	3.67E+00	
Astatine (85)	At-208	3.72E+03	1.86E-04	4.48E+01	3.08E+03	1.82E+00	1.02E-05	1.32E-05	6.36E-06	2.69E-05	2.20E-04	7.67E-05	4.60E-05	1.17E-01	
Astatine (85)	At-209	1.12E+03	6.18E-04	6.92E+01	4.92E+02	2.37E+00	8.50E-06	1.09E-05	5.28E-06	2.81E-05	2.29E-04	8.00E-05	4.69E-05	.	
Astatine (85)	At-210	7.49E+02	9.25E-04	1.11E+01	6.61E+02	4.55E-01	1.58E-05	2.04E-05	9.84E-06	3.34E-05	2.72E-04	9.51E-05	5.31E-05	1.17E-01	
Astatine (85)	At-211	8.42E+02	8.24E-04	6.46E+01	1.13E+02	2.58E+01	5.20E-04	6.70E-04	3.23E-04	1.52E-03	5.24E-03	2.95E-03	5.62E-05	8.50E+00	
Astatine (85)	At-215	2.19E+11	3.17E-12	2.23E+30	3.02E+30	1.13E+31	7.06E+00	3.08E+01	4.59E+00	.	1.17E+05	7.45E+04	5.09E+04	2.67E-01	
Astatine (85)	At-216	7.28E+10	9.51E-12	5.41E+21	7.49E+21	2.78E+22	2.02E-03	2.61E-03	1.25E-03	7.45E-02	3.61E-01	1.86E-01	1.74E-01	1.08E-01	
Astatine (85)	At-217	6.77E+08	1.02E-09	5.24E+19	1.19E+21	1.64E+20	3.09E-03	3.99E-03	1.92E-03	7.06E-02	3.88E-01	1.72E-01	1.23E-01	5.30E-03	
Astatine (85)	At-218	1.46E+07	4.76E-08	7.62E+04	1.93E+07	8.15E+03	7.44E-06	9.58E-06	4.62E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	4.97E-03	
Astatine (85)	At-219	3.90E+05	1.78E-06	3.90E+05	1.78E-06	.	5.84E-03	7.55E-03	3.63E-03	1.34E-01	1.01E+00	3.11E-01	1.51E-01	8.37E-02	
Astatine (85)	At-220	9.82E+04	7.06E-06	5.53E+08	3.49E+08	7.15E+10	3.09E-04	3.98E-04	1.92E-04	2.05E-03	2.07E-03	1.14E-03	6.47E-05	5.61E-02	
Gold (79)	Au-186	3.40E+04	2.04E-05	1.28E+03	1.90E+03	1.34E+08	1.92E-05	2.47E-05	1.19E-05	7.03E-04	4.80E-03	2.80E-03	6.57E-04	.	
Gold (79)	Au-187	4.34E+04	1.60E-05	8.93E+07	3.79E+08	6.06E+07	1.27E-01	3.35E-01	8.17E-02	5.81E-02	3.46E-01	1.94E-01	1.89E-03	.	
Gold (79)	Au-190	8.51E+03	8.14E-05	5.70E+12	1.98E+15	3.44E+12	8.51E-06	1.10E-05	5.29E-06	5.12E-04	3.13E-03	1.85E-03	1.91E-04	.	
Gold (79)	Au-191	1.91E+03	3.63E-04	1.55E+02	3.20E+02	9.17E+01	1.02E-01	1.57E-01	6.38E-02	2.30E-02	1.18E-01	1.66E-02	3.11E-03	2.69E-01	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Gold (79)	Au-192	1.23E+03	5.64E-04	3.81E+10	5.18E+10	1.94E+11	1.43E-01	4.56E-01	9.22E-02	8.44E-02	7.02E-01	1.01E-02	2.11E+01	.	
Gold (79)	Au-193	3.44E+02	2.01E-03	7.86E+01	1.19E+02	4.03E+01	9.32E-02	1.23E-01	5.80E-02	5.58E-02	3.93E-01	8.93E-03	2.50E-02	2.69E+00	
Gold (79)	Au-193m	5.60E+06	1.24E-07	3.90E+07	9.97E+08	2.68E+07	8.89E-02	1.21E-01	5.54E-02	5.57E-02	3.92E-01	8.93E-03	2.49E-02	2.69E+00	
Gold (79)	Au-194	1.60E+02	4.34E-03	3.71E+00	5.41E+00	1.90E+00	1.57E-01	3.07E-01	9.99E-02	3.30E-02	2.74E-01	3.95E-03	8.23E+00	.	
Gold (79)	Au-195	1.36E+00	5.10E-01	1.02E+00	1.61E+00	4.87E-01	3.45E-02	4.46E-02	2.15E-02	3.33E-02	2.79E-01	3.99E-03	8.36E+00	.	
Gold (79)	Au-195m	7.17E+05	9.67E-07	5.40E+05	8.50E+05	2.57E+05	3.39E-02	4.44E-02	2.11E-02	3.33E-02	2.79E-01	3.99E-03	8.36E+00	.	
Gold (79)	Au-196	4.09E+01	1.69E-02	2.50E+00	3.66E+00	1.28E+00	1.46E-01	2.16E-01	9.14E-02	3.43E-02	2.86E-01	4.10E-03	8.57E+00	6.66E+02	
Gold (79)	Au-196m	6.32E+02	1.10E-03	3.87E+01	5.66E+01	1.98E+01	6.57E-02	9.26E-02	4.11E-02	1.37E-02	1.15E-01	1.65E-03	3.45E+00	6.66E+02	
Gold (79)	Au-198	9.39E+01	7.38E-03	6.01E+00	8.98E+00	3.01E+00	5.40E-02	7.27E-02	3.37E-02	8.21E-03	6.87E-02	9.83E-04	2.06E+00	1.11E+02	
Gold (79)	Au-198m	1.11E+02	6.22E-03	3.50E+00	5.24E+00	1.75E+00	1.92E-02	2.56E-02	1.20E-02	3.85E-03	3.22E-02	4.61E-04	9.66E-01	1.11E+02	
Gold (79)	Au-199	8.06E+01	8.60E-03	2.79E+01	4.33E+01	1.34E+01	7.05E-02	9.19E-02	4.39E-02	1.82E-02	1.52E-01	2.18E-03	4.57E+00	6.66E+02	
Gold (79)	Au-200	7.53E+03	9.21E-05	8.84E+15	1.20E+16	4.50E+16	8.43E-01	2.11E+00	5.40E-01	3.47E-01	2.88E+00	4.15E-02	8.64E+01	.	
Gold (79)	Au-200m	3.25E+02	2.13E-03	4.12E+00	6.02E+00	2.11E+00	5.86E-02	9.89E-02	3.70E-02	1.03E-02	8.57E-02	1.23E-03	2.57E+00	.	
Gold (79)	Au-201	1.40E+04	4.95E-05	2.30E+18	3.13E+18	1.17E+19	4.17E+00	7.58E+00	2.64E+00	1.26E+00	1.05E+01	1.51E-01	3.14E+02	.	
Gold (79)	Au-202	7.59E+05	9.13E-07	4.03E+28	5.40E+28	2.06E+29	1.91E+00	8.34E+00	1.24E+00	.	3.18E+04	2.03E+04	9.54E+05	.	
Barium (56)	Ba-124	3.31E+04	2.09E-05	1.41E+19	1.91E+19	4.29E+19	1.96E-01	7.90E-01	1.27E-01	4.90E-01	3.87E+00	5.25E-01	2.32E-03	.	
Barium (56)	Ba-126	3.64E+03	1.90E-04	1.16E+13	1.58E+13	9.16E+12	1.55E-01	4.29E-01	9.95E-02	6.17E-02	4.92E-01	6.61E-02	2.95E-04	.	
Barium (56)	Ba-127	2.87E+04	2.42E-05	3.36E+03	4.85E+03	1.71E+03	2.23E-01	7.47E-01	1.44E-01	4.93E-01	3.65E+00	7.73E-02	5.16E-03	.	
Barium (56)	Ba-128	1.04E+02	6.66E-03	2.64E+00	4.14E+00	7.48E-03	2.71E-02	3.67E-02	1.69E-02	3.28E-03	2.62E-02	3.52E-03	1.57E-05	.	
Barium (56)	Ba-129	2.72E+03	2.55E-04	2.89E+02	4.24E+02	2.72E+01	3.20E-01	6.47E-01	2.04E-01	1.50E-01	1.13E+00	2.73E-02	1.32E-03	.	
Barium (56)	Ba-129m	2.81E+03	2.47E-04	2.98E+02	4.37E+02	2.81E+01	1.46E-01	4.12E-01	9.41E-02	1.35E-01	1.02E+00	2.68E-02	1.09E-03	.	
Barium (56)	Ba-131	2.20E+01	3.15E-02	1.29E+00	1.93E+00	1.18E-02	6.15E-02	8.38E-02	3.84E-02	2.39E-02	1.88E-01	1.43E-02	1.23E-04	1.33E-02	
Barium (56)	Ba-131m	2.49E+04	2.78E-05	1.46E+03	2.19E+03	1.34E+01	6.06E-02	8.31E-02	3.78E-02	2.38E-02	1.88E-01	1.43E-02	1.23E-04	1.33E-02	
Barium (56)	Ba-133	6.59E-02	1.05E+01	5.71E-03	9.20E-03	1.24E-05	6.94E-03	8.98E-03	4.31E-03	7.95E-03	6.28E-02	8.51E-03	3.77E-05	.	
Barium (56)	Ba-133m	1.56E+02	4.44E-03	1.12E+01	1.86E+01	1.90E-02	6.49E-03	8.40E-03	4.03E-03	5.29E-03	4.19E-02	5.66E-03	2.52E-05	.	
Barium (56)	Ba-135m	2.12E+02	3.28E-03	1.07E+02	2.02E+02	9.38E-02	1.30E-01	1.69E-01	8.07E-02	2.01E-02	1.61E-01	2.16E-02	9.68E-05	.	
Barium (56)	Ba-137m	1.43E+05	4.86E-06	2.23E+23	3.01E+23	1.14E+24	5.88E-01	2.57E+00	3.82E-01	.	9.72E+03	6.19E+03	5.83E+00	.	
Barium (56)	Ba-139	4.39E+03	1.58E-04	1.46E+15	2.06E+15	7.20E+13	1.06E+00	1.51E+00	6.61E-01	1.40E-01	1.12E+00	1.51E-01	6.71E-04	.	
Barium (56)	Ba-140	1.98E+01	3.49E-02	1.75E-01	2.63E-01	1.48E-03	7.71E-03	1.04E-02	4.80E-03	1.99E-03	1.62E-02	1.38E-03	1.65E-05	2.00E-03	
Barium (56)	Ba-141	1.99E+04	3.48E-05	8.34E+03	1.41E+04	2.27E+03	1.52E-02	2.02E-02	9.44E-03	7.55E-03	6.29E-02	3.21E-03	1.11E-03	1.33E+01	
Barium (56)	Ba-142	3.44E+04	2.02E-05	8.08E+14	1.10E+15	4.12E+15	8.42E-02	2.93E-01	5.45E-02	8.19E-02	6.74E-01	4.14E-02	2.81E-03	.	
Beryllium (4)	Be-10	4.59E-07	1.51E+06	5.90E-02	6.48E+00	9.64E-03	2.45E-03	3.15E-03	1.52E-03	7.32E-03	6.07E-02	1.24E-02	6.01E-02	.	
Beryllium (4)	Be-7	4.75E+00	1.46E-01	2.45E+00	3.59E+00	1.26E+00	9.29E-01	1.32E+00	5.81E-01	6.20E-01	5.08E+00	1.04E+00	5.03E+00	2.20E+02	
Bismuth (83)	Bi-197	3.92E+04	1.77E-05	4.10E+03	5.22E+04	2.52E+03	1.26E-02	1.80E-02	7.29E-03	3.15E-02	8.65E-02	1.18E-03	3.73E-01	2.10E+02	
Bismuth (83)	Bi-200	1.00E+04	6.93E-05	1.69E+02	2.48E+02	8.58E+01	5.27E-02	1.16E-01	3.36E-02	2.28E-02	1.69E-01	1.81E-02	3.49E-02	5.55E+01	
Bismuth (83)	Bi-201	3.37E+03	2.05E-04	1.99E+03	2.91E+03	8.59E+02	7.40E-02	1.62E-01	4.72E-02	3.86E-02	2.55E-01	2.99E-02	7.21E-02	5.00E+01	
Bismuth (83)	Bi-202	3.53E+03	1.96E-04	3.90E+05	9.54E+05	1.00E+05	1.62E-03	2.11E-03	1.01E-03	1.58E-03	1.18E-02	2.77E-03	1.85E-03	1.68E+01	
Bismuth (83)	Bi-203	5.16E+02	1.34E-03	4.39E+00	6.60E+00	2.56E+01	6.48E-02	1.32E-01	4.12E-02	1.78E-02	9.88E-02	4.34E-02	3.03E-02	5.56E+00	
Bismuth (83)	Bi-204	5.41E+02	1.28E-03	4.31E+00	6.48E+00	1.80E+08	7.74E-02	1.98E-01	4.96E-02	2.50E-02	1.22E-01	6.25E-02	5.80E-02	.	
Bismuth (83)	Bi-205	1.65E+01	4.19E-02	2.07E-01	3.27E-01	1.10E-01	3.22E-02	4.68E-02	2.01E-02	1.36E-02	6.94E-02	3.35E-02	2.73E-02	.	
Bismuth (83)	Bi-206	4.05E+01	1.71E-02	2.69E-01	4.33E-01	1.43E-01	2.67E-02	4.20E-02	1.68E-02	6.78E-03	3.29E-02	1.69E-02	1.58E-02	1.78E+00	
Bismuth (83)	Bi-207	2.11E-02	3.29E+01	6.75E-04	1.18E-03	2.70E-04	2.07E-03	2.69E-03	1.29E-03	9.13E-03	4.44E-02	2.28E-02	2.13E-02	3.55E+00	
Bismuth (83)	Bi-208	1.88E-06	3.68E+05	2.85E-04	4.55E-04	9.71E-05	2.26E-03	2.96E-03	1.41E-03	1.13E-02	6.75E-02	3.47E-02	3.24E-02	.	
Bismuth (83)	Bi-210	5.05E+01	1.37E-02	6.03E-01	5.09E+01	3.02E-02	1.54E-05	1.98E-05	9.55E-06	3.32E-05	2.70E-04	9.45E-05	5.71E-05	8.11E-02	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Bismuth (83)	Bi-210m	2.28E-07	3.04E+06	3.56E-04	6.26E-03	1.72E-04	7.87E-06	1.01E-05	4.89E-06	9.69E-04	4.69E-03	2.42E-03	2.25E-03	.	
Bismuth (83)	Bi-211	1.70E+05	4.07E-06	1.73E+24	2.35E+24	8.84E+24	7.08E+00	3.09E+01	4.60E+00	.	1.17E+05	7.48E+04	5.94E+04	2.67E-01	
Bismuth (83)	Bi-212	6.02E+03	1.15E-04	4.47E+14	6.19E+14	2.29E+15	2.02E-03	2.61E-03	1.25E-03	7.45E-02	3.61E-01	1.86E-01	1.74E-01	1.08E-01	
Bismuth (83)	Bi-212n	5.20E+04	1.33E-05	4.50E+21	6.10E+21	2.29E+22	3.82E+00	1.67E+01	2.48E+00	.	6.34E+04	4.04E+04	1.35E+04	.	
Bismuth (83)	Bi-213	7.99E+03	8.67E-05	6.19E+14	1.40E+16	1.94E+15	3.09E-03	3.99E-03	1.92E-03	7.06E-02	3.88E-01	1.72E-01	1.22E-01	8.23E-02	
Bismuth (83)	Bi-214	1.83E+04	3.79E-05	9.57E+01	2.42E+04	1.02E+01	7.44E-06	9.58E-06	4.62E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	4.06E-02	
Bismuth (83)	Bi-215	4.79E+04	1.45E-05	1.84E+18	2.56E+18	9.19E+18	5.66E-03	7.33E-03	3.52E-03	1.30E-01	9.76E-01	3.02E-01	1.47E-01	8.11E-02	
Bismuth (83)	Bi-216	1.68E+05	4.13E-06	9.49E+08	5.98E+08	1.23E+11	3.09E-04	3.99E-04	1.92E-04	2.05E-03	1.52E-02	4.79E-03	2.36E-03	5.61E-02	
Berkelium (97)	Bk-245	5.12E+01	1.35E-02	7.87E+00	1.17E+01	2.47E-02	6.33E-07	8.15E-07	3.93E-07	6.37E-05	5.15E-04	4.30E-06	1.01E-06	1.76E-04	
Berkelium (97)	Bk-246	1.41E+02	4.93E-03	4.11E+00	6.00E+00	4.38E-02	9.77E-07	1.26E-06	6.07E-07	1.64E-05	1.24E-04	2.44E-06	6.80E-07	1.06E-04	
Berkelium (97)	Bk-247	5.02E-04	1.38E+03	4.77E-03	1.36E-02	2.17E-07	5.05E-07	6.50E-07	3.14E-07	5.18E-05	3.96E-04	3.03E-06	1.09E-06	3.11E-04	
Berkelium (97)	Bk-248m	2.56E+02	2.71E-03	6.71E+01	2.16E+02	1.06E-03	5.67E-07	7.31E-07	3.53E-07	2.96E-05	2.23E-04	1.68E-06	3.41E-07	1.44E-04	
Berkelium (97)	Bk-249	7.67E-01	9.04E-01	9.60E-01	1.93E+00	3.84E-04	5.58E-07	7.19E-07	3.47E-07	5.61E-05	4.54E-04	4.28E-06	1.01E-06	1.76E-04	
Berkelium (97)	Bk-250	1.89E+03	3.67E-04	7.69E+02	7.24E+03	6.11E-01	8.43E-07	1.09E-06	5.24E-07	1.60E-05	1.21E-04	2.44E-06	6.80E-07	1.06E-04	
Berkelium (97)	Bk-251	6.55E+03	1.06E-04	4.48E+04	1.48E+05	1.38E+03	4.68E-07	6.03E-07	2.91E-07	4.73E-05	3.64E-04	2.40E-06	1.03E-06	3.11E-04	
Bromine (35)	Br-72	2.78E+05	2.49E-06	7.49E+02	5.52E+03	7.62E+01	9.87E-03	1.41E-02	6.18E-03	2.01E-03	2.98E-03	9.74E-05	5.30E-06	.	
Bromine (35)	Br-73	1.07E+05	6.47E-06	4.48E+04	2.98E+06	3.33E+04	3.15E-02	4.80E-02	1.98E-02	2.33E-02	5.49E-02	1.57E-03	3.50E-05	7.40E-03	
Bromine (35)	Br-74	1.43E+04	4.83E-05	1.72E+16	2.34E+16	8.59E+16	6.70E-02	2.80E-01	4.35E-02	3.76E-01	2.75E+00	5.11E-02	1.52E-01	.	
Bromine (35)	Br-74m	7.92E+03	8.75E-05	5.18E+16	7.03E+16	2.53E+17	7.57E-02	3.01E-01	4.91E-02	2.23E-01	1.63E+00	3.03E-02	8.99E-02	.	
Bromine (35)	Br-75	3.77E+03	1.84E-04	2.57E+01	4.28E+02	2.25E+00	3.80E-02	5.54E-02	2.38E-02	6.95E-03	7.06E-03	2.50E-04	1.40E-03	6.67E+00	
Bromine (35)	Br-76	3.75E+02	1.85E-03	3.02E+00	4.41E+00	4.76E+05	7.43E-02	1.73E-01	4.75E-02	3.85E-02	2.82E-01	5.24E-03	1.56E-02	.	
Bromine (35)	Br-76m	1.67E+07	4.15E-08	2.32E+08	2.23E+08	2.13E+10	7.42E-02	1.73E-01	4.75E-02	3.87E-02	2.83E-01	5.26E-03	1.56E-02	.	
Bromine (35)	Br-77	1.06E+02	6.51E-03	8.75E+00	1.28E+01	2.52E+00	5.43E-01	1.05E+00	3.45E-01	1.83E-01	1.34E+00	2.49E-02	7.37E-02	.	
Bromine (35)	Br-77m	8.51E+04	8.14E-06	6.99E+03	1.03E+04	2.02E+03	5.32E-01	1.05E+00	3.38E-01	1.83E-01	1.34E+00	2.49E-02	7.37E-02	.	
Bromine (35)	Br-78	5.64E+04	1.23E-05	4.16E+20	5.65E+20	2.12E+21	3.42E-01	1.49E+00	2.22E-01	.	5.64E+03	3.59E+03	3.11E+02	.	
Bromine (35)	Br-80	2.06E+04	3.36E-05	2.25E+19	3.07E+19	7.74E+19	2.96E+00	7.17E+00	1.89E+00	1.15E+00	8.42E+00	1.56E-01	4.65E-01	.	
Bromine (35)	Br-80m	1.37E+03	5.05E-04	5.29E+11	7.44E+11	6.72E+11	5.35E-01	7.58E-01	3.35E-01	1.66E-01	1.22E+00	2.25E-02	6.71E-02	.	
Bromine (35)	Br-82	1.72E+02	4.03E-03	1.54E+00	2.25E+00	5.35E-01	6.46E-02	1.28E-01	4.11E-02	3.25E-02	2.37E-01	4.42E-03	1.31E-02	2.04E-01	
Bromine (35)	Br-82m	5.94E+04	1.17E-05	5.43E+02	7.95E+02	1.89E+02	6.62E-02	1.31E-01	4.21E-02	3.33E-02	2.43E-01	4.53E-03	1.34E-02	2.09E-01	
Bromine (35)	Br-83	2.53E+03	2.74E-04	1.65E+15	2.49E+15	8.79E+14	1.67E+00	2.21E+00	1.04E+00	6.40E-01	4.69E+00	8.70E-02	2.59E-01	.	
Bromine (35)	Br-84	1.15E+04	6.05E-05	1.13E+16	1.54E+16	5.45E+16	1.68E-01	6.47E-01	1.09E-01	3.71E-01	2.72E+00	5.05E-02	1.50E-01	.	
Bromine (35)	Br-84m	6.07E+04	1.14E-05	4.89E+20	6.64E+20	2.49E+21	1.21E-01	5.29E-01	7.87E-02	.	1.99E+03	1.27E+03	1.10E+02	.	
Bromine (35)	Br-85	1.26E+05	5.52E-06	7.50E+06	1.11E+07	3.39E+06	1.58E+00	6.91E+00	1.03E+00	.	2.60E+04	1.66E+04	4.35E+03	.	
Carbon (6)	C-10	1.14E+06	6.11E-07	2.88E+28	3.84E+28	1.47E+29	2.02E-01	8.81E-01	1.31E-01	.	3.32E+03	2.11E+03	6.64E+03	.	
Carbon (6)	C-11	1.79E+04	3.88E-05	3.86E+17	5.24E+17	1.57E+18	3.33E-01	1.32E+00	2.16E-01	1.35E+00	6.50E+00	7.07E-04	1.30E+01	.	
Carbon (6)	C-14	1.22E-04	5.70E+03	1.52E-02	4.11E+01	3.91E-05	1.36E-02	1.75E-02	8.43E-03	3.77E-02	2.36E-02	1.97E-05	4.72E-02	1.48E+02	
Calcium (20)	Ca-41	6.79E-06	1.02E+05	1.79E-02	1.55E+02	1.37E-03	3.88E-01	5.00E-01	2.41E-01	1.47E-01	3.55E-01	1.56E-01	2.91E-03	.	
Calcium (20)	Ca-45	1.55E+00	4.46E-01	1.10E-01	1.22E+03	1.29E-02	1.79E-02	2.31E-02	1.11E-02	2.24E-02	5.43E-02	2.38E-02	4.46E-04	3.03E-03	
Calcium (20)	Ca-47	5.58E+01	1.24E-02	5.80E-01	1.63E+00	1.11E-01	1.79E-02	2.42E-02	1.12E-02	4.69E-03	1.48E-02	7.03E-04	1.37E-04	2.42E-02	
Calcium (20)	Ca-49	4.18E+04	1.66E-05	3.49E+18	5.00E+18	5.76E+18	8.95E-02	3.56E-01	5.80E-02	2.61E-01	2.18E+00	1.38E-02	3.36E+00	.	
Cadmium (48)	Cd-101	2.68E+05	2.59E-06	2.41E+04	3.70E+04	1.03E+04	4.42E-02	9.93E-02	2.82E-02	3.47E-02	2.11E-01	9.28E-02	1.44E-03	.	
Cadmium (48)	Cd-102	6.62E+04	1.05E-05	1.82E+18	2.47E+18	9.20E+18	7.39E-02	3.20E-01	4.81E-02	1.43E+00	6.07E+00	6.77E-01	1.81E+00	.	
Cadmium (48)	Cd-103	4.99E+04	1.39E-05	2.13E+04	6.32E+06	1.83E+04	5.98E-02	1.22E-01	3.80E-02	3.79E-02	1.83E-01	7.52E-02	2.84E-02	2.63E+00	
Cadmium (48)	Cd-104	6.31E+03	1.10E-04	3.07E+15	4.28E+15	8.62E+15	1.46E-01	4.89E-01	9.43E-02	1.19E-01	2.44E-01	5.34E-02	3.43E-04	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Cadmium (48)	Cd-105	6.56E+03	1.06E-04	2.87E+02	5.08E+02	7.14E+01	5.22E-02	8.35E-02	3.28E-02	2.89E-02	1.13E-01	1.36E-02	9.75E-04	4.23E+00	
Cadmium (48)	Cd-107	9.34E+02	7.42E-04	5.46E+10	8.59E+11	9.22E+09	7.19E-01	9.40E-01	4.47E-01	1.46E-01	2.45E-01	6.39E-02	2.94E-04	.	
Cadmium (48)	Cd-109	5.48E-01	1.26E+00	1.19E-02	9.81E+00	1.86E-04	1.05E-02	1.35E-02	6.52E-03	1.12E-02	1.87E-02	4.90E-03	2.25E-05	2.66E-02	
Cadmium (48)	Cd-111m	7.51E+03	9.23E-05	1.03E+16	1.45E+16	2.57E+16	1.06E+00	3.13E+00	6.86E-01	1.64E+00	2.74E+00	7.16E-01	3.29E-03	.	
Cadmium (48)	Cd-113	9.00E-17	7.70E+15	1.94E-04	2.66E+00	1.97E-06	2.06E-03	2.66E-03	1.28E-03	2.61E-03	4.34E-03	1.14E-03	5.21E-06	.	
Cadmium (48)	Cd-113m	4.91E-02	1.41E+01	2.70E-04	3.14E+00	3.54E-06	1.74E-03	2.24E-03	1.08E-03	2.05E-03	3.40E-03	8.92E-04	4.09E-06	.	
Cadmium (48)	Cd-115	1.14E+02	6.10E-03	1.10E+00	1.25E+01	1.97E-02	5.86E-04	7.55E-04	3.64E-04	1.37E-03	5.86E-03	4.48E-05	1.16E-05	3.99E-03	
Cadmium (48)	Cd-115m	5.67E+00	1.22E-01	3.33E-02	5.51E+00	5.25E-04	5.27E-04	6.79E-04	3.28E-04	1.11E-03	3.78E-03	4.26E-05	6.15E-06	3.99E-03	
Cadmium (48)	Cd-117	2.44E+03	2.84E-04	4.61E+04	4.55E+05	2.43E+04	1.18E-01	2.41E-01	7.50E-02	2.87E-02	5.96E-02	2.53E-03	7.63E-05	.	
Cadmium (48)	Cd-117m	1.81E+03	3.84E-04	1.78E+04	1.78E+05	9.37E+03	8.69E-02	2.26E-01	5.58E-02	4.00E-02	7.02E-02	9.00E-03	8.59E-05	.	
Cadmium (48)	Cd-118	7.24E+03	9.57E-05	6.60E+15	1.79E+16	1.99E+15	8.17E-01	1.26E+00	5.13E-01	1.24E-01	2.07E-01	5.41E-02	2.49E-04	.	
Cadmium (48)	Cd-119	1.35E+05	5.12E-06	7.64E+06	9.29E+09	4.05E+06	1.73E-01	6.94E-01	1.12E-01	7.71E-01	5.85E+00	2.02E-02	1.74E+00	.	
Cadmium (48)	Cd-119m	1.66E+05	4.19E-06	1.40E+06	1.70E+09	7.42E+05	1.02E-01	3.97E-01	6.62E-02	2.40E+00	6.29E+00	1.90E-01	2.19E+00	.	
Cerium (58)	Ce-130	1.59E+04	4.36E-05	4.06E+17	5.52E+17	2.07E+18	1.23E-01	4.92E-01	7.97E-02	3.77E-01	3.11E+00	1.50E-01	3.73E+00	.	
Cerium (58)	Ce-131	3.57E+04	1.94E-05	2.09E+03	3.12E+03	1.91E+01	4.33E-02	7.30E-02	2.73E-02	2.24E-02	1.78E-01	1.32E-02	1.23E-04	1.33E-02	
Cerium (58)	Ce-132	1.73E+03	4.01E-04	1.80E+10	2.44E+10	9.12E+10	8.01E-02	1.64E-01	5.10E-02	1.40E-02	1.17E-01	6.04E-03	2.32E-01	.	
Cerium (58)	Ce-133	3.76E+03	1.85E-04	3.26E+02	5.25E+02	7.06E-01	6.81E-03	8.89E-03	4.23E-03	7.43E-03	5.89E-02	7.22E-03	3.77E-05	.	
Cerium (58)	Ce-133m	1.24E+03	5.59E-04	1.07E+02	1.73E+02	2.33E-01	6.61E-03	8.78E-03	4.12E-03	6.93E-03	5.51E-02	6.13E-03	3.77E-05	.	
Cerium (58)	Ce-134	8.00E+01	8.66E-03	2.71E+00	4.11E+00	1.11E+00	2.74E-02	3.67E-02	1.71E-02	3.07E-03	2.56E-02	1.22E-03	3.08E-02	.	
Cerium (58)	Ce-135	3.43E+02	2.02E-03	1.08E+01	1.57E+01	5.47E+00	2.27E-01	4.63E-01	1.44E-01	4.51E-02	3.75E-01	1.83E-02	4.98E-01	.	
Cerium (58)	Ce-137	6.75E+02	1.03E-03	2.51E+07	5.44E+07	6.87E+06	1.61E-02	2.08E-02	1.00E-02	1.07E-01	8.90E-01	4.77E-02	2.42E+00	.	
Cerium (58)	Ce-137m	1.76E+02	3.93E-03	8.44E+01	1.40E+02	2.41E+01	1.40E-02	1.80E-02	8.69E-03	1.28E-02	1.07E-01	5.17E-03	1.38E-01	.	
Cerium (58)	Ce-139	1.84E+00	3.77E-01	4.41E-01	6.57E-01	1.98E-01	3.28E-02	4.26E-02	2.04E-02	3.83E-02	3.19E-01	1.52E-02	3.83E-01	.	
Cerium (58)	Ce-141	7.78E+00	8.91E-02	3.27E+00	5.53E+00	8.89E-01	1.69E-02	2.18E-02	1.05E-02	1.11E-02	9.24E-02	4.41E-03	1.11E-01	1.33E+01	
Cerium (58)	Ce-143	1.84E+02	3.77E-03	1.67E+01	2.76E+01	6.19E+00	1.64E-02	2.13E-02	1.02E-02	3.40E-03	2.82E-02	2.27E-03	2.34E-02	1.56E+00	
Cerium (58)	Ce-144	8.88E-01	7.81E-01	1.93E-01	6.27E-01	2.20E-02	2.17E-05	2.80E-05	1.35E-05	8.26E-04	6.83E-03	4.91E-04	5.98E-03	2.84E-01	
Cerium (58)	Ce-145	1.21E+05	5.73E-06	1.20E+14	2.30E+14	4.85E+14	1.57E-01	2.73E-01	9.93E-02	2.24E-02	1.85E-01	3.79E-02	1.20E-01	.	
Californium (98)	Cf-244	1.88E+04	3.69E-05	4.68E+02	2.00E+03	1.68E-02	8.28E-07	1.07E-06	5.15E-07	7.87E-05	4.92E-04	4.31E-06	6.63E-07	5.13E-04	
Californium (98)	Cf-246	1.70E+02	4.08E-03	7.27E+01	4.58E+03	2.90E-04	1.18E-06	1.52E-06	7.33E-07	1.70E-05	1.28E-04	2.81E-06	8.34E-07	1.85E-04	
Californium (98)	Cf-247	1.95E+03	3.55E-04	1.84E+04	5.24E+04	8.42E-01	5.05E-07	6.50E-07	3.14E-07	5.18E-05	3.96E-04	3.03E-06	1.09E-06	3.11E-04	
Californium (98)	Cf-248	7.57E-01	9.15E-01	2.57E-01	1.27E+01	2.20E-06	6.15E-07	7.92E-07	3.82E-07	3.11E-05	2.13E-04	2.35E-06	3.41E-07	1.43E-04	
Californium (98)	Cf-249	1.97E-03	3.51E+02	2.47E-03	4.94E-03	9.90E-07	5.58E-07	7.19E-07	3.47E-07	5.62E-05	4.55E-04	4.29E-06	1.01E-06	1.76E-04	
Californium (98)	Cf-250	5.30E-02	1.31E+01	2.16E-02	2.03E-01	1.71E-05	8.43E-07	1.09E-06	5.24E-07	1.60E-05	1.21E-04	2.44E-06	6.80E-07	1.06E-04	
Californium (98)	Cf-251	7.70E-04	9.00E+02	5.26E-03	1.74E-02	1.62E-04	4.68E-07	6.03E-07	2.91E-07	4.73E-05	3.64E-04	2.40E-06	1.03E-06	3.11E-04	
Californium (98)	Cf-252	2.62E-01	2.65E+00	1.05E-02	1.86E-02	1.22E-03	4.53E-07	5.83E-07	2.82E-07	2.57E-05	1.83E-04	1.04E-06	3.49E-07	1.53E-04	
Californium (98)	Cf-253	1.42E+01	4.88E-02	6.31E+00	3.54E+01	7.12E-03	5.37E-07	6.92E-07	3.34E-07	5.38E-05	4.36E-04	4.28E-06	1.01E-06	1.76E-04	
Californium (98)	Cf-254	4.18E+00	1.66E-01	5.03E-03	8.05E-03	2.41E-03	1.48E-06	1.90E-06	9.17E-07	2.45E-05	1.95E-04	4.66E-05	3.08E-05	1.31E-01	
Californium (98)	Cf-255	4.29E+03	1.62E-04	1.90E+03	1.94E+04	9.04E+02	4.53E-07	5.84E-07	2.82E-07	4.55E-05	3.51E-04	2.40E-06	1.03E-06	3.11E-04	
Chlorine (17)	Cl-34	1.43E+07	4.84E-08	3.20E+35	4.27E+35	1.63E+36	3.41E-01	1.49E+00	2.21E-01	.	5.64E+03	3.59E+03	2.82E+00	.	
Chlorine (17)	Cl-34m	1.14E+04	6.09E-05	6.36E+15	1.05E+16	1.53E+16	1.21E-01	4.76E-01	7.85E-02	3.11E-01	4.37E-02	2.46E-02	2.19E-05	.	
Chlorine (17)	Cl-36	2.30E-06	3.01E+05	8.67E-05	3.33E+00	3.95E-06	2.28E-03	2.93E-03	1.41E-03	1.70E-02	2.39E-03	1.34E-03	1.19E-06	1.30E-02	
Chlorine (17)	Cl-38	9.78E+03	7.09E-05	1.40E+16	2.64E+16	2.59E+16	1.96E-01	7.12E-01	1.27E-01	2.83E-01	3.98E-02	2.24E-02	1.99E-05	1.85E-02	
Chlorine (17)	Cl-39	6.55E+03	1.06E-04	2.10E+07	3.18E+07	7.15E+06	2.06E-01	7.42E-01	1.34E-01	3.61E-01	5.08E-02	2.86E-02	2.54E-05	.	
Chlorine (17)	Cl-40	2.70E+05	2.57E-06	1.62E+24	2.16E+24	8.24E+24	7.48E-02	3.27E-01	4.86E-02	.	1.24E+03	7.87E+02	6.18E-01	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Curium (96)	Cm-238	2.53E+03	2.74E-04	9.45E+02	2.08E+03	6.91E-03	1.34E-06	1.73E-06	8.35E-07	1.74E-05	1.31E-04	3.22E-06	8.49E-07	2.02E-04	
Curium (96)	Cm-239	2.09E+03	3.31E-04	3.32E+02	4.85E+02	1.30E-03	6.21E-07	8.00E-07	3.86E-07	6.52E-05	4.90E-04	3.32E-06	1.19E-06	3.91E-04	
Curium (96)	Cm-240	9.37E+00	7.40E-02	2.34E-01	9.99E-01	8.39E-06	8.28E-07	1.07E-06	5.15E-07	7.88E-05	4.92E-04	4.31E-06	6.63E-07	5.13E-04	
Curium (96)	Cm-241	7.71E+00	8.99E-02	4.37E-01	6.44E-01	2.01E-04	7.09E-07	9.14E-07	4.41E-07	7.21E-05	5.81E-04	6.90E-06	1.07E-06	1.92E-04	
Curium (96)	Cm-242	1.55E+00	4.46E-01	9.94E-01	5.20E+01	2.65E-06	1.19E-06	1.53E-06	7.39E-07	1.71E-05	1.29E-04	2.81E-06	8.34E-07	1.85E-04	
Curium (96)	Cm-243	2.38E-02	2.91E+01	8.16E-03	2.00E-02	7.70E-08	5.65E-07	7.28E-07	3.51E-07	5.90E-05	4.47E-04	2.62E-06	1.13E-06	3.35E-04	
Curium (96)	Cm-244	3.83E-02	1.81E+01	2.71E-02	1.22E+00	1.10E-07	6.60E-07	8.50E-07	4.10E-07	3.20E-05	2.17E-04	2.35E-06	3.41E-07	1.43E-04	
Curium (96)	Cm-245	8.15E-05	8.50E+03	5.87E-03	2.20E-02	3.92E-08	6.33E-07	8.15E-07	3.93E-07	6.40E-05	5.17E-04	4.30E-06	1.01E-06	1.76E-04	
Curium (96)	Cm-246	1.46E-04	4.76E+03	1.34E-02	2.27E-01	4.64E-08	9.77E-07	1.26E-06	6.07E-07	1.64E-05	1.24E-04	2.44E-06	6.80E-07	1.06E-04	
Curium (96)	Cm-247	4.44E-08	1.56E+07	1.48E-03	3.15E-03	9.37E-09	5.20E-07	6.70E-07	3.23E-07	5.29E-05	4.05E-04	2.41E-06	1.03E-06	3.11E-04	
Curium (96)	Cm-248	1.99E-06	3.48E+05	5.42E-04	9.85E-04	1.03E-08	4.81E-07	6.19E-07	2.99E-07	2.66E-05	1.88E-04	1.01E-06	3.39E-07	1.48E-04	
Curium (96)	Cm-249	5.68E+03	1.22E-04	7.11E+03	1.43E+04	2.85E+00	5.58E-07	7.19E-07	3.47E-07	5.61E-05	4.54E-04	4.28E-06	1.01E-06	1.76E-04	
Curium (96)	Cm-250	8.35E-05	8.30E+03	5.51E-05	9.53E-05	1.42E-09	2.18E-07	2.81E-07	1.36E-07	1.36E-05	1.08E-04	3.40E-07	4.86E-07	4.07E-04	
Curium (96)	Cm-251	2.17E+04	3.20E-05	1.48E+05	4.91E+05	4.57E+03	4.68E-07	6.03E-07	2.91E-07	4.73E-05	3.64E-04	2.40E-06	1.03E-06	3.11E-04	
Cobalt (27)	Co-54m	2.46E+05	2.82E-06	4.08E+24	5.45E+24	2.08E+25	8.59E-02	3.75E-01	5.58E-02	.	1.42E+03	9.02E+02	6.80E+02	.	
Cobalt (27)	Co-55	3.46E+02	2.00E-03	3.90E+00	6.08E+00	1.98E+00	4.50E-02	7.10E-02	2.83E-02	9.59E-03	5.68E-02	4.27E-03	2.90E-02	6.51E+01	
Cobalt (27)	Co-56	3.28E+00	2.12E-01	1.86E-02	2.90E-02	9.69E-03	8.28E-03	1.14E-02	5.17E-03	5.29E-03	3.06E-02	7.58E-03	1.47E-02	.	
Cobalt (27)	Co-57	9.31E-01	7.44E-01	2.13E-01	4.25E-01	1.15E-01	6.04E-02	7.88E-02	3.76E-02	5.05E-02	2.93E-01	7.25E-02	1.41E-01	1.78E+01	
Cobalt (27)	Co-58	3.57E+00	1.94E-01	8.19E-02	1.29E-01	4.28E-02	2.68E-02	3.65E-02	1.67E-02	1.82E-02	1.05E-01	2.61E-02	5.04E-02	5.33E+00	
Cobalt (27)	Co-58m	6.72E+02	1.03E-03	1.54E+01	2.43E+01	8.05E+00	2.66E-02	3.61E-02	1.66E-02	1.74E-02	1.01E-01	2.50E-02	4.83E-02	5.16E+00	
Cobalt (27)	Co-60	1.31E-01	5.27E+00	1.05E-03	1.79E-03	5.42E-04	2.24E-03	2.93E-03	1.40E-03	3.37E-03	1.95E-02	4.84E-03	9.38E-03	1.78E+00	
Cobalt (27)	Co-60m	3.48E+04	1.99E-05	2.80E+02	4.74E+02	1.44E+02	2.25E-03	2.93E-03	1.40E-03	3.38E-03	1.96E-02	4.85E-03	9.40E-03	1.78E+00	
Cobalt (27)	Co-61	3.68E+03	1.88E-04	3.29E+14	4.96E+14	1.71E+15	1.10E+00	1.74E+00	6.95E-01	2.14E-01	1.24E+00	3.07E-01	5.96E-01	.	
Cobalt (27)	Co-62	2.43E+05	2.85E-06	4.85E+24	6.53E+24	2.47E+25	2.00E-01	8.74E-01	1.30E-01	.	3.32E+03	2.11E+03	1.59E+03	.	
Cobalt (27)	Co-62m	2.62E+04	2.65E-05	2.08E+18	2.82E+18	1.06E+19	1.19E-01	4.99E-01	7.73E-02	6.44E-01	3.70E+00	9.22E-01	1.78E+00	.	
Chromium (24)	Cr-48	2.82E+02	2.46E-03	1.98E+00	2.92E+00	9.20E-01	1.71E-02	2.50E-02	1.07E-02	5.87E-03	4.66E-02	2.31E-03	1.23E-04	1.00E+00	
Chromium (24)	Cr-49	8.61E+03	8.05E-05	3.51E+05	2.57E+08	1.74E+04	2.24E-01	5.35E-01	1.43E-01	2.05E-01	1.68E+00	9.17E-02	6.66E-04	.	
Chromium (24)	Cr-51	9.13E+00	7.59E-02	7.81E+00	1.14E+01	3.99E+00	1.23E+00	1.71E+00	7.66E-01	2.83E-01	2.40E+00	1.49E-01	4.80E-04	4.44E-02	
Chromium (24)	Cr-55	1.04E+05	6.65E-06	4.98E+24	6.77E+24	2.54E+25	4.52E+01	1.98E+02	2.94E+01	.	9.47E+05	6.03E+05	1.89E+02	.	
Chromium (24)	Cr-56	6.13E+04	1.13E-05	2.11E+13	3.00E+13	1.09E+14	1.37E-01	3.68E-01	8.82E-02	5.07E-02	1.76E-01	2.04E-02	2.09E-01	1.33E+01	
Cesium (55)	Cs-121	1.41E+05	4.92E-06	5.22E+03	9.22E+03	2.79E+03	4.91E-02	9.88E-02	3.12E-02	3.16E-02	1.21E-01	3.21E-02	3.30E-04	.	
Cesium (55)	Cs-121m	1.79E+05	3.87E-06	6.63E+03	1.17E+04	3.55E+03	4.78E-02	9.76E-02	3.04E-02	3.16E-02	1.21E-01	3.21E-02	3.30E-04	.	
Cesium (55)	Cs-123	6.19E+04	1.12E-05	5.66E+07	1.21E+08	5.16E+07	4.49E-02	6.94E-02	2.82E-02	3.25E-02	1.42E-01	3.99E-02	9.35E-05	.	
Cesium (55)	Cs-124	7.10E+05	9.77E-07	2.30E+27	3.08E+27	1.17E+28	2.98E-01	1.30E+00	1.94E-01	.	4.93E+03	3.14E+03	5.03E+01	.	
Cesium (55)	Cs-125	8.09E+03	8.56E-05	2.71E+02	1.39E+03	1.78E+02	8.06E-03	1.05E-02	5.02E-03	2.17E-03	1.34E-02	4.18E-03	2.69E-06	.	
Cesium (55)	Cs-126	2.22E+05	3.12E-06	1.78E+24	2.38E+24	9.07E+24	3.04E-01	1.33E+00	1.98E-01	.	5.01E+03	3.19E+03	5.11E+01	.	
Cesium (55)	Cs-127	9.71E+02	7.13E-04	1.14E+02	1.65E+02	5.85E+01	4.27E-01	1.25E+00	2.75E-01	8.41E-01	5.98E+00	8.23E-02	6.10E-02	.	
Cesium (55)	Cs-128	1.00E+05	6.93E-06	2.73E+23	3.70E+23	1.39E+24	3.97E-01	1.73E+00	2.58E-01	.	6.56E+03	4.18E+03	6.69E+01	.	
Cesium (55)	Cs-129	1.89E+02	3.66E-03	2.01E+01	2.95E+01	1.89E+00	5.45E-01	9.63E-01	3.45E-01	3.06E-01	2.17E+00	2.99E-02	2.22E-02	.	
Cesium (55)	Cs-130	1.25E+04	5.56E-05	9.91E+17	1.35E+18	3.28E+18	6.63E-01	2.45E+00	4.29E-01	1.23E+00	8.74E+00	1.20E-01	8.91E-02	.	
Cesium (55)	Cs-130m	1.05E+05	6.58E-06	7.39E+18	1.00E+19	2.45E+19	6.15E-01	2.30E+00	3.99E-01	1.23E+00	8.75E+00	1.20E-01	8.93E-02	.	
Cesium (55)	Cs-131	2.61E+01	2.65E-02	2.14E+02	8.58E+02	3.15E-01	1.21E+00	1.58E+00	7.55E-01	3.02E-01	2.15E+00	2.96E-02	2.19E-02	7.55E+00	
Cesium (55)	Cs-132	3.90E+01	1.78E-02	1.35E+00	2.01E+00	5.58E-02	1.55E-01	2.55E-01	9.77E-02	3.88E-02	2.74E-01	3.80E-03	2.80E-03	.	
Cesium (55)	Cs-134	3.36E-01	2.06E+00	4.20E-03	7.66E-03	1.94E-05	3.24E-03	4.21E-03	2.01E-03	1.45E-03	1.01E-02	1.42E-04	1.04E-04	3.02E-02	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)										Protection of Groundwater (DAF = 1)	
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Cesium (55)	Cs-134m	2.09E+03	3.31E-04	2.62E+01	4.77E+01	1.21E-01	3.23E-03	4.20E-03	2.01E-03	1.45E-03	1.01E-02	1.42E-04	1.03E-04	3.01E-02	
Cesium (55)	Cs-135	3.01E-07	2.30E+06	1.58E-02	8.74E+00	9.65E-06	6.83E-03	8.80E-03	4.25E-03	9.64E-03	6.75E-02	9.44E-04	6.88E-04	3.40E-01	
Cesium (55)	Cs-135m	6.87E+03	1.01E-04	3.60E+08	1.99E+11	2.20E+05	6.62E-03	8.71E-03	4.12E-03	9.57E-03	6.70E-02	9.37E-04	6.83E-04	3.40E-01	
Cesium (55)	Cs-136	1.92E+01	3.61E-02	2.07E-01	3.14E-01	4.94E-03	1.96E-02	2.76E-02	1.23E-02	6.72E-03	4.75E-02	6.58E-04	4.84E-04	3.02E-01	
Cesium (55)	Cs-137	2.30E-02	3.02E+01	1.48E-03	3.36E-03	3.07E-06	2.04E-03	2.63E-03	1.27E-03	2.01E-03	1.41E-02	1.97E-04	1.43E-04	7.55E-02	
Cesium (55)	Cs-138	1.09E+04	6.36E-05	6.45E+15	8.76E+15	2.41E+16	1.30E-01	5.04E-01	8.42E-02	3.32E-01	2.37E+00	3.25E-02	2.42E-02	.	
Cesium (55)	Cs-138m	1.25E+05	5.54E-06	8.34E+16	1.13E+17	3.12E+17	1.34E-01	5.31E-01	8.72E-02	4.10E-01	2.92E+00	4.01E-02	2.98E-02	.	
Cesium (55)	Cs-139	3.93E+04	1.76E-05	1.16E+16	1.64E+16	5.73E+14	5.16E-01	1.13E+00	3.29E-01	1.40E-01	1.12E+00	1.51E-01	6.71E-04	.	
Cesium (55)	Cs-140	3.43E+05	2.02E-06	3.03E+03	4.55E+03	2.56E+01	7.39E-03	1.02E-02	4.61E-03	1.99E-03	1.62E-02	1.38E-03	1.65E-05	2.00E-03	
Copper (29)	Cu-57	1.11E+08	6.22E-09	8.35E+06	1.21E+07	1.11E+07	2.88E-02	4.61E-02	1.81E-02	1.03E-02	7.56E-02	2.74E-02	2.37E-02	1.78E+01	
Copper (29)	Cu-59	2.68E+05	2.58E-06	2.79E+10	3.04E+12	7.68E+09	6.87E-02	1.11E-01	4.33E-02	1.96E-01	1.54E+00	6.66E-01	4.32E-01	3.11E+00	
Copper (29)	Cu-60	1.54E+04	4.51E-05	8.70E+16	1.18E+17	4.43E+17	8.18E-02	3.40E-01	5.31E-02	3.90E-01	2.39E+00	2.78E-01	1.27E+00	.	
Copper (29)	Cu-61	1.82E+03	3.80E-04	3.33E+11	4.57E+11	1.67E+12	2.99E-01	7.56E-01	1.92E-01	1.16E-01	7.20E-01	8.32E-02	3.82E-01	.	
Copper (29)	Cu-62	3.77E+04	1.84E-05	5.39E+19	7.31E+19	2.74E+20	3.50E-01	1.53E+00	2.28E-01	.	5.79E+03	3.69E+03	3.07E+03	.	
Copper (29)	Cu-64	4.78E+02	1.45E-03	6.09E+01	9.60E+01	1.19E+09	4.11E-01	6.22E-01	2.58E-01	7.98E-02	4.95E-01	5.71E-02	2.62E-01	1.77E+01	
Copper (29)	Cu-66	7.11E+04	9.74E-06	1.61E+22	2.19E+22	8.21E+22	3.23E+00	1.41E+01	2.10E+00	.	5.43E+04	3.46E+04	2.88E+04	.	
Copper (29)	Cu-67	9.82E+01	7.06E-03	1.89E+01	4.15E+01	7.04E+00	9.68E-02	1.27E-01	6.02E-02	2.74E-02	1.70E-01	1.96E-02	9.02E-02	.	
Copper (29)	Cu-69	1.28E+05	5.42E-06	1.11E+18	1.19E+20	4.00E+18	5.38E-01	1.72E+00	3.47E-01	7.40E-01	8.00E-01	4.80E-02	7.60E-01	2.11E+02	
Dysprosium (66)	Dy-148	1.10E+05	6.28E-06	2.54E+05	2.22E+07	5.61E+04	1.51E-05	1.95E-05	9.39E-06	1.37E-03	1.12E-02	4.40E-03	7.36E-03	.	
Dysprosium (66)	Dy-149	8.67E+04	7.99E-06	3.73E+03	5.47E+03	1.89E+03	1.30E-02	1.86E-02	8.15E-03	1.30E-02	1.09E-01	1.20E-02	1.09E-01	.	
Dysprosium (66)	Dy-150	5.08E+04	1.36E-05	1.32E+03	1.94E+03	6.80E+02	1.06E-05	1.36E-05	6.59E-06	8.46E-04	6.95E-03	1.63E-04	5.70E-03	.	
Dysprosium (66)	Dy-151	2.03E+04	3.41E-05	5.15E+02	7.53E+02	1.93E+03	3.21E-04	4.15E-04	2.00E-04	1.08E-02	8.98E-02	2.72E-03	9.83E-02	9.20E+00	
Dysprosium (66)	Dy-152	2.55E+03	2.72E-04	4.03E+01	5.89E+01	8.36E+05	7.58E-06	9.76E-06	4.71E-06	6.05E-04	4.95E-03	1.90E-04	3.73E-03	2.13E-01	
Dysprosium (66)	Dy-153	9.49E+02	7.31E-04	7.71E+01	1.14E+02	3.92E+01	2.14E-02	2.90E-02	1.33E-02	1.41E-02	1.18E-01	1.03E-02	1.41E-01	1.44E+01	
Dysprosium (66)	Dy-154	2.31E-07	3.00E+06	2.16E-02	1.96E+00	9.38E-04	5.87E-06	7.56E-06	3.65E-06	5.26E-04	4.31E-03	1.30E-04	3.87E-03	.	
Dysprosium (66)	Dy-155	6.13E+02	1.13E-03	1.55E+02	2.31E+02	7.83E+01	1.11E-01	1.74E-01	6.98E-02	2.67E-02	2.24E-01	1.29E-02	7.19E-01	.	
Dysprosium (66)	Dy-157	7.46E+02	9.29E-04	8.68E+04	1.85E+05	2.32E+04	5.75E-02	7.69E-02	3.58E-02	1.21E-01	1.01E+00	5.26E-02	2.38E+00	.	
Dysprosium (66)	Dy-159	1.75E+00	3.96E-01	5.49E+00	8.80E+00	1.65E+00	1.31E-01	1.70E-01	8.17E-02	9.51E-02	7.99E-01	3.46E-02	1.20E+00	.	
Dysprosium (66)	Dy-165	2.60E+03	2.66E-04	2.02E+14	2.81E+14	8.65E+14	9.56E-01	1.29E+00	5.96E-01	1.26E-01	1.05E+00	4.57E-02	1.58E+00	5.55E+01	
Dysprosium (66)	Dy-165m	2.90E+05	2.39E-06	2.28E+16	3.18E+16	9.77E+16	9.39E-01	1.31E+00	5.86E-01	1.28E-01	1.08E+00	4.67E-02	1.62E+00	5.06E+00	
Dysprosium (66)	Dy-166	7.44E+01	9.32E-03	2.66E+01	6.48E+01	4.93E+00	1.72E-02	2.21E-02	1.07E-02	2.50E-03	2.10E-02	1.52E-03	2.48E-02	3.10E+00	
Dysprosium (66)	Dy-167	5.87E+04	1.18E-05	1.76E+14	2.39E+14	8.94E+14	2.81E-01	7.07E-01	1.80E-01	1.36E-01	1.14E+00	4.61E-01	1.06E+00	.	
Dysprosium (66)	Dy-168	4.19E+04	1.66E-05	5.73E+19	7.78E+19	2.92E+20	2.77E-01	1.21E+00	1.80E-01	.	4.56E+03	2.91E+03	4.78E+03	.	
Erbium (68)	Er-154	9.77E+04	7.10E-06	5.42E+05	7.93E+05	2.78E+05	5.88E-06	7.58E-06	3.66E-06	5.26E-04	4.32E-03	1.31E-04	3.88E-03	.	
Erbium (68)	Er-156	1.87E+04	3.71E-05	1.27E+15	1.73E+15	6.47E+15	1.42E-01	4.91E-01	9.17E-02	1.56E-01	1.30E+00	5.28E-01	1.08E+00	.	
Erbium (68)	Er-159	1.01E+04	6.85E-05	3.17E+04	5.08E+04	9.51E+03	8.69E-02	1.45E-01	5.48E-02	8.38E-02	7.04E-01	3.41E-02	9.29E-01	.	
Erbium (68)	Er-161	1.89E+03	3.66E-04	4.82E+11	6.54E+11	2.45E+12	2.74E-01	8.06E-01	1.77E-01	1.41E-01	1.19E+00	4.81E-01	8.05E-01	.	
Erbium (68)	Er-163	4.86E+03	1.43E-04	1.25E+09	2.34E+11	3.00E+08	1.90E-01	2.46E-01	1.18E-01	2.05E+00	1.72E+01	6.97E+00	1.43E+01	.	
Erbium (68)	Er-165	5.86E+02	1.18E-03	1.53E+09	8.15E+08	1.85E+11	5.10E+00	8.05E+00	3.20E+00	5.76E-01	4.87E+00	1.97E+00	3.17E+00	.	
Erbium (68)	Er-167m	9.63E+06	7.19E-08	8.39E+35	1.12E+36	4.27E+36	4.05E+00	1.77E+01	2.63E+00	.	6.58E+04	4.19E+04	4.28E+04	.	
Erbium (68)	Er-169	2.69E+01	2.58E-02	3.01E+02	2.11E+04	8.49E+01	5.26E-02	6.78E-02	3.27E-02	2.04E-02	1.73E-01	6.98E-02	1.12E-01	7.22E+00	
Erbium (68)	Er-171	8.08E+02	8.58E-04	1.82E+04	1.88E+05	1.01E+04	4.14E-02	5.49E-02	2.58E-02	1.90E-02	1.61E-01	7.12E-02	8.36E-02	4.54E+00	
Erbium (68)	Er-172	1.23E+02	5.63E-03	3.01E+00	4.47E+00	1.55E+00	1.92E-02	2.57E-02	1.20E-02	3.03E-03	2.56E-02	1.31E-02	1.03E-02	.	
Erbium (68)	Er-173	2.54E+05	2.73E-06	1.50E+13	3.77E+11	5.42E+12	1.44E-01	2.84E-01	9.17E-02	3.06E-02	2.58E-01	1.57E-01	8.51E-02	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident Soil Total PRG TR=1E-06 (Bq/g)	Composite Worker Soil Total PRG TR=1E-06 (Bq/g)	Farmer Soil Total PRG TR=1E-06 (Bq/g)	Resident Air Total PRG (no decay) (Bq/m <sup>3</sup> )	Composite Worker Air Total PRG (no decay) (Bq/m <sup>3</sup> )	Farmer Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Resident Finfish PRG (Bq/g)	Resident Tap Water PRG (Bq/L)	Farmer Tap Water Total PRG (Bq/L)	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
Einsteinium (99)	Es-249	3.56E+03	1.94E-04	4.29E+03	8.43E+03	1.79E+00	5.59E-07	7.20E-07	3.47E-07	5.62E-05	4.55E-04	4.29E-06	1.01E-06	1.76E-04	
Einsteinium (99)	Es-250	7.06E+02	9.82E-04	2.92E+02	2.75E+03	2.32E-01	8.56E-07	1.10E-06	5.32E-07	1.62E-05	1.23E-04	2.48E-06	6.90E-07	1.08E-04	
Einsteinium (99)	Es-250m	2.73E+03	2.53E-04	1.11E+03	1.05E+04	8.84E-01	8.43E-07	1.09E-06	5.24E-07	1.60E-05	1.21E-04	2.44E-06	6.80E-07	1.06E-04	
Einsteinium (99)	Es-251	1.84E+02	3.77E-03	7.61E+01	1.17E+02	1.41E+01	4.68E-07	6.03E-07	2.91E-07	4.73E-05	3.64E-04	2.41E-06	1.03E-06	3.11E-04	
Einsteinium (99)	Es-253	1.24E+01	5.61E-02	5.92E+00	3.11E+01	6.19E-03	5.44E-07	7.01E-07	3.38E-07	5.41E-05	4.38E-04	4.28E-06	1.01E-06	1.76E-04	
Einsteinium (99)	Es-254	9.17E-01	7.55E-01	2.14E-02	3.44E-02	2.96E-04	7.70E-07	9.92E-07	4.79E-07	1.57E-05	1.19E-04	2.44E-06	6.80E-07	1.06E-04	
Einsteinium (99)	Es-254m	1.54E+02	4.49E-03	6.54E+00	1.10E+01	5.08E-02	8.52E-07	1.10E-06	5.29E-07	1.61E-05	1.22E-04	2.49E-06	6.92E-07	1.08E-04	
Einsteinium (99)	Es-255	6.36E+00	1.09E-01	2.81E+00	2.89E+01	1.34E+00	4.53E-07	5.84E-07	2.82E-07	4.55E-05	3.52E-04	2.40E-06	1.03E-06	3.11E-04	
Einsteinium (99)	Es-256	1.43E+04	4.83E-05	7.09E+03	1.26E+04	8.27E+02	5.45E-06	7.02E-06	3.39E-06	1.90E-04	9.26E-04	1.27E-05	4.07E-06	1.88E-03	
Europium (63)	Eu-142	9.34E+06	7.42E-08	3.04E+18	4.12E+18	1.50E+19	1.39E-01	4.59E-01	8.96E-02	1.01E-01	8.49E-01	1.18E-02	7.89E-01	.	
Europium (63)	Eu-142m	2.98E+05	2.33E-06	9.52E+16	1.29E+17	4.71E+17	7.32E-02	2.74E-01	4.74E-02	1.01E-01	8.48E-01	1.18E-02	7.89E-01	.	
Europium (63)	Eu-143	1.41E+05	4.93E-06	1.15E+04	1.71E+04	5.93E+03	2.22E-02	3.13E-02	1.39E-02	6.07E-02	4.49E-01	1.78E-01	2.02E-01	.	
Europium (63)	Eu-144	2.14E+06	3.23E-07	2.60E+30	3.48E+30	1.32E+31	3.13E-01	1.37E+00	2.03E-01	.	5.17E+03	3.30E+03	1.55E+05	.	
Europium (63)	Eu-145	4.27E+01	1.62E-02	7.69E-01	1.13E+00	3.78E-01	1.10E-02	1.46E-02	6.86E-03	1.29E-02	1.06E-01	3.63E-03	1.67E-01	.	
Europium (63)	Eu-146	5.49E+01	1.26E-02	5.42E-01	7.92E-01	2.79E-01	1.66E-05	2.14E-05	1.03E-05	1.29E-03	1.06E-02	1.65E-04	1.10E-02	.	
Europium (63)	Eu-147	1.05E+01	6.60E-02	6.02E-01	8.83E-01	3.09E-01	1.82E-05	2.35E-05	1.13E-05	1.49E-03	1.22E-02	1.82E-04	1.20E-02	5.16E-01	
Europium (63)	Eu-148	4.64E+00	1.49E-01	5.11E-02	7.46E-02	2.62E-02	1.08E-05	1.39E-05	6.72E-06	8.71E-04	7.13E-03	1.95E-04	5.88E-03	2.12E-01	
Europium (63)	Eu-149	2.72E+00	2.55E-01	1.93E+00	2.95E+00	9.85E-01	1.31E-01	1.70E-01	8.14E-02	5.88E-02	4.90E-01	3.19E-02	1.47E+01	.	
Europium (63)	Eu-150	1.88E-02	3.69E+01	7.97E-04	1.20E-03	3.00E-04	8.43E-04	1.09E-03	5.24E-04	1.34E-02	1.11E-01	7.26E-03	3.32E+00	.	
Europium (63)	Eu-150m	4.74E+02	1.46E-03	2.34E+02	3.74E+02	6.04E+06	9.90E-06	1.27E-05	6.15E-06	8.06E-04	6.61E-03	1.81E-04	5.28E-03	.	
Europium (63)	Eu-152	5.12E-02	1.35E+01	1.42E-03	2.13E-03	6.16E-04	2.65E-05	3.42E-05	1.65E-05	1.82E-03	1.49E-02	6.12E-04	1.34E-02	7.59E-01	
Europium (63)	Eu-152m	6.52E+02	1.06E-03	3.12E+08	1.15E+08	1.56E+10	1.05E-05	1.35E-05	6.54E-06	8.38E-04	6.86E-03	2.63E-04	5.22E-03	2.95E-01	
Europium (63)	Eu-152n	3.79E+03	1.83E-04	1.05E+02	1.58E+02	4.57E+01	2.65E-05	3.42E-05	1.65E-05	1.81E-03	1.49E-02	6.11E-04	1.34E-02	7.59E-01	
Europium (63)	Eu-154	8.06E-02	8.59E+00	1.73E-03	2.58E-03	8.09E-04	1.11E-03	1.43E-03	6.90E-04	5.31E-03	4.42E-02	2.88E-03	1.33E+00	6.66E+01	
Europium (63)	Eu-154m	7.92E+03	8.75E-05	1.70E+02	2.53E+02	7.94E+01	1.11E-03	1.43E-03	6.90E-04	5.30E-03	4.41E-02	2.88E-03	1.32E+00	6.66E+01	
Europium (63)	Eu-155	1.46E-01	4.76E+00	1.18E-01	1.94E-01	5.82E-02	1.20E-02	1.54E-02	7.44E-03	2.66E-02	2.22E-01	1.45E-02	6.67E+00	6.66E+02	
Europium (63)	Eu-156	1.67E+01	4.16E-02	2.97E-01	4.40E-01	1.52E-01	1.38E-02	1.84E-02	8.59E-03	3.85E-03	3.22E-02	2.09E-03	9.65E-01	.	
Europium (63)	Eu-157	4.00E+02	1.73E-03	3.93E+01	5.88E+01	2.45E+07	1.23E-01	1.70E-01	7.70E-02	1.38E-02	1.15E-01	7.47E-03	3.45E+00	.	
Europium (63)	Eu-158	7.94E+03	8.73E-05	4.15E+16	5.64E+16	2.12E+17	2.29E-01	7.87E-01	1.48E-01	2.58E-01	2.13E+00	1.40E-01	6.39E+01	.	
Europium (63)	Eu-159	2.01E+04	3.44E-05	1.07E+04	1.71E+04	3.13E+08	1.24E-01	1.74E-01	7.75E-02	1.52E-02	1.28E-01	4.39E-02	8.63E-02	4.81E+00	
Fluorine (9)	F-17	3.39E+05	2.04E-06	3.31E+25	4.42E+25	1.68E+26	3.47E-01	1.52E+00	2.26E-01	.	5.73E+03	3.65E+03	8.61E+02	.	
Fluorine (9)	F-18	3.32E+03	2.09E-04	1.83E+13	2.48E+13	9.29E+13	3.04E-01	9.69E-01	1.96E-01	6.02E-01	4.38E+00	2.03E+00	6.58E-01	1.11E+01	
Iron (26)	Fe-52	7.34E+02	9.45E-04	2.44E+02	4.07E+02	1.31E+02	4.35E-02	7.87E-02	2.75E-02	7.09E-03	4.74E-02	6.48E-04	4.24E-02	2.28E+02	
Iron (26)	Fe-53	4.28E+04	1.62E-05	1.62E+10	1.95E+14	8.09E+09	1.33E-01	2.49E-01	8.43E-02	3.39E-01	1.18E+00	1.36E-01	1.41E+00	.	
Iron (26)	Fe-53m	1.44E+05	4.81E-06	5.45E+10	6.57E+14	2.73E+10	5.98E-02	1.63E-01	3.84E-02	3.39E-01	1.18E+00	1.36E-01	1.41E+00	.	
Iron (26)	Fe-55	2.53E-01	2.74E+00	5.37E-01	7.30E+02	4.48E-02	1.55E-01	2.00E-01	9.65E-02	6.50E-02	4.42E-01	5.80E-03	3.89E-01	6.51E+01	
Iron (26)	Fe-59	5.68E+00	1.22E-01	1.00E-01	1.58E-01	3.65E-02	1.48E-02	1.98E-02	9.23E-03	6.76E-03	4.64E-02	6.03E-04	4.08E-02	6.51E+00	
Iron (26)	Fe-60	4.62E-07	1.50E+06	1.67E-04	5.24E-04	1.71E-05	4.72E-04	6.09E-04	2.93E-04	2.77E-04	1.85E-03	2.68E-05	1.51E-03	1.78E+00	
Iron (26)	Fe-61	6.09E+04	1.14E-05	5.11E+15	7.71E+15	2.66E+16	1.96E-01	6.50E-01	1.26E-01	2.14E-01	1.24E+00	3.07E-01	5.96E-01	.	
Iron (26)	Fe-62	3.21E+05	2.16E-06	1.76E+24	2.35E+24	8.97E+24	1.56E-01	6.80E-01	1.01E-01	.	2.58E+03	1.64E+03	1.38E+03	.	
Fermium (100)	Fm-251	1.15E+03	6.05E-04	4.82E+02	7.38E+02	2.10E+01	4.69E-07	6.04E-07	2.91E-07	4.73E-05	3.65E-04	2.42E-06	1.03E-06	3.11E-04	
Fermium (100)	Fm-252	2.39E+02	2.90E-03	6.04E+01	3.27E+03	6.95E-04	6.13E-07	7.89E-07	3.81E-07	3.08E-05	2.11E-04	2.35E-06	3.41E-07	1.43E-04	
Fermium (100)	Fm-253	8.43E+01	8.22E-03	2.21E+01	5.90E+01	4.23E-02	5.44E-07	7.01E-07	3.38E-07	5.39E-05	4.37E-04	4.28E-06	1.01E-06	1.76E-04	
Fermium (100)	Fm-254	1.87E+03	3.70E-04	7.63E+02	7.18E+03	6.06E-01	8.43E-07	1.09E-06	5.24E-07	1.60E-05	1.21E-04	2.44E-06	6.81E-07	1.06E-04	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Fermium (100)	Fm-255	3.02E+02	2.29E-03	2.77E+02	4.14E+03	6.38E+02	4.67E-07	6.02E-07	2.90E-07	4.66E-05	3.59E-04	2.40E-06	1.03E-06	3.11E-04	
Fermium (100)	Fm-256	2.31E+03	3.00E-04	1.14E+03	2.03E+03	1.33E+01	5.47E-06	7.05E-06	3.40E-06	2.02E-04	9.58E-04	1.27E-05	4.07E-06	1.88E-03	
Fermium (100)	Fm-257	2.52E+00	2.75E-01	2.72E-01	7.32E-01	1.26E-03	5.05E-07	6.51E-07	3.14E-07	5.14E-05	4.17E-04	4.29E-06	1.02E-06	1.77E-04	
Francium (87)	Fr-212	1.82E+04	3.81E-05	2.18E+02	1.50E+04	8.86E+00	1.02E-05	1.31E-05	6.34E-06	2.68E-05	2.19E-04	7.64E-05	4.59E-05	1.17E-01	
Francium (87)	Fr-219	1.09E+09	6.34E-10	1.11E+28	1.51E+28	5.67E+28	6.60E+00	2.88E+01	4.29E+00		1.09E+05	6.97E+04	4.53E+04	2.67E-01	
Francium (87)	Fr-220	7.98E+05	8.69E-07	5.90E+16	8.17E+16	3.03E+17	2.02E-03	2.62E-03	1.26E-03	7.48E-02	3.63E-01	1.87E-01	1.74E-01	1.08E-01	
Francium (87)	Fr-221	7.43E+04	9.32E-06	5.61E+15	1.26E+17	1.76E+16	3.09E-03	3.99E-03	1.92E-03	7.06E-02	3.88E-01	1.72E-01	1.23E-01	5.10E-03	
Francium (87)	Fr-222	2.57E+04	2.70E-05	1.34E+02	3.40E+04	1.43E+01	7.44E-06	9.58E-06	4.62E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	4.79E-02	
Francium (87)	Fr-223	1.66E+04	4.19E-05	1.49E+02	2.23E+03	2.77E-01	7.85E-06	1.01E-05	4.88E-06	2.16E-04	1.40E-03	2.80E-04	1.93E-06	6.57E-04	
Francium (87)	Fr-224	1.09E+05	6.34E-06	7.50E+02	2.42E+03	2.59E+00	1.90E-05	2.45E-05	1.18E-05	2.74E-04	1.98E-03	3.83E-04	2.66E-06	6.58E-04	
Francium (87)	Fr-227	1.47E+05	4.70E-06	2.14E+03	2.61E+04	2.66E+00	1.08E-06	1.39E-06	6.70E-07	1.15E-04	8.28E-04	5.45E-05	1.91E-06	6.60E-04	
Gallium (31)	Ga-64	1.39E+05	5.00E-06	2.99E+22	4.02E+22	1.52E+23	9.63E-02	4.21E-01	6.26E-02		1.58E+03	1.01E+03	4.76E+02	.	
Gallium (31)	Ga-65	2.40E+04	2.89E-05	1.19E+02	1.39E+03	4.45E+01	2.63E-02	3.74E-02	1.65E-02	4.89E-03	5.30E-03	3.19E-04	5.02E-03	1.05E+01	
Gallium (31)	Ga-66	6.40E+02	1.08E-03	2.14E+07	8.59E+06	2.92E+09	5.59E-02	1.04E-01	3.54E-02	8.04E-03	6.84E-02	4.56E-03	2.05E-02	.	
Gallium (31)	Ga-67	7.76E+01	8.93E-03	1.59E+01	2.33E+01	6.38E+00	1.98E-01	2.70E-01	1.23E-01	4.90E-02	4.17E-01	2.78E-02	1.25E-01	.	
Gallium (31)	Ga-68	5.38E+03	1.29E-04	2.58E+14	3.51E+14	1.30E+15	3.06E-01	9.36E-01	1.97E-01	1.88E-01	1.59E+00	1.07E-01	4.79E-01	.	
Gallium (31)	Ga-70	1.72E+04	4.02E-05	3.10E+19	4.22E+19	1.35E+20	6.13E+00	9.04E+00	3.84E+00	1.04E+00	8.78E+00	5.91E-01	2.64E+00	.	
Gallium (31)	Ga-72	4.31E+02	1.61E-03	3.54E+00	5.15E+00	8.31E+06	5.42E-02	1.03E-01	3.44E-02	9.21E-03	7.82E-02	5.22E-03	2.35E-02	1.11E+00	
Gallium (31)	Ga-73	1.25E+03	5.55E-04	1.41E+12	1.93E+12	6.31E+12	2.62E-01	4.11E-01	1.65E-01	3.70E-02	3.15E-01	2.10E-02	9.45E-02	.	
Gallium (31)	Ga-74	4.49E+04	1.54E-05	2.85E+19	3.87E+19	1.45E+20	1.02E-01	4.44E-01	6.61E-02		1.68E+03	1.07E+03	5.04E+02	.	
Gadolinium (64)	Gd-142	3.11E+05	2.23E-06	9.96E+16	1.35E+17	4.92E+17	9.79E-02	3.49E-01	6.34E-02	1.01E-01	8.48E-01	1.18E-02	7.89E-01	.	
Gadolinium (64)	Gd-143m	1.99E+05	3.49E-06	1.62E+04	2.42E+04	8.37E+03	1.95E-02	3.00E-02	1.23E-02	6.07E-02	4.49E-01	1.78E-01	2.02E-01	.	
Gadolinium (64)	Gd-144	8.15E+04	8.50E-06	4.98E+21	6.76E+21	2.54E+22	1.70E-01	7.44E-01	1.11E-01		2.81E+03	1.79E+03	3.91E+03	.	
Gadolinium (64)	Gd-145	1.58E+04	4.38E-05	2.85E+02	4.17E+02	1.40E+02	1.02E-02	1.43E-02	6.35E-03	1.27E-02	1.04E-01	3.62E-03	1.60E-01	.	
Gadolinium (64)	Gd-145m	2.57E+05	2.70E-06	4.62E+03	6.77E+03	2.27E+03	1.00E-02	1.42E-02	6.26E-03	1.27E-02	1.04E-01	3.62E-03	1.60E-01	.	
Gadolinium (64)	Gd-146	5.24E+00	1.32E-01	4.92E-02	7.20E-02	2.53E-02	1.66E-05	2.13E-05	1.03E-05	1.15E-03	9.48E-03	1.64E-04	9.22E-03	.	
Gadolinium (64)	Gd-147	1.59E+02	4.35E-03	2.18E+00	3.19E+00	1.12E+00	1.82E-05	2.34E-05	1.13E-05	1.39E-03	1.14E-02	1.82E-04	1.09E-02	5.16E-01	
Gadolinium (64)	Gd-148	9.29E-03	7.46E+01	2.14E-02	1.87E+00	4.72E-03	1.51E-05	1.95E-05	9.39E-06	1.38E-03	1.13E-02	4.63E-03	7.37E-03	.	
Gadolinium (64)	Gd-149	2.73E+01	2.54E-02	1.37E+00	2.01E+00	7.01E-01	4.05E-02	5.45E-02	2.52E-02	1.48E-02	1.24E-01	2.16E-02	1.07E-01	.	
Gadolinium (64)	Gd-150	3.87E-07	1.79E+06	2.12E-02	1.83E+00	4.39E-03	8.81E-06	1.13E-05	5.48E-06	7.45E-04	6.11E-03	1.63E-04	4.70E-03	.	
Gadolinium (64)	Gd-151	2.04E+00	3.40E-01	1.52E+00	2.34E+00	7.58E-01	5.23E-02	6.77E-02	3.25E-02	3.94E-02	3.31E-01	1.34E-01	2.15E-01	5.16E+07	
Gadolinium (64)	Gd-152	6.42E-15	1.08E+14	2.69E-02	2.34E+00	5.58E-03	7.57E-06	9.76E-06	4.71E-06	6.34E-04	5.19E-03	1.95E-04	3.76E-03	2.12E-01	
Gadolinium (64)	Gd-153	1.05E+00	6.59E-01	6.87E-01	1.06E+00	3.42E-01	2.66E-02	3.44E-02	1.66E-02	3.39E-02	2.84E-01	1.15E-01	1.85E-01	1.44E+01	
Gadolinium (64)	Gd-159	3.29E+02	2.11E-03	1.74E+02	2.80E+02	8.46E+01	1.43E-01	1.87E-01	8.89E-02	1.58E-02	1.33E-01	5.37E-02	8.64E-02	4.81E+00	
Gadolinium (64)	Gd-162	4.34E+04	1.60E-05	1.04E+19	1.42E+19	5.31E+19	2.31E-01	1.01E+00	1.50E-01		3.81E+03	2.42E+03	7.13E+03	.	
Germanium (32)	Ge-66	2.69E+03	2.58E-04	6.85E+07	2.75E+07	9.32E+09	4.79E-02	9.18E-02	3.04E-02	7.65E-03	5.66E-02	3.07E-03	5.90E-03	.	
Germanium (32)	Ge-67	1.93E+04	3.60E-05	3.93E+03	5.76E+03	1.58E+03	1.07E-01	2.09E-01	6.80E-02	4.51E-02	3.09E-01	1.52E-02	2.42E-02	.	
Germanium (32)	Ge-68	9.34E-01	7.42E-01	1.07E-02	3.63E-02	3.71E-04	2.20E-03	2.85E-03	1.37E-03	7.35E-03	1.61E-02	4.59E-04	4.09E-04	.	
Germanium (32)	Ge-69	1.55E+02	4.46E-03	3.43E+00	5.68E+00	4.47E-01	1.68E-01	3.23E-01	1.07E-01	6.90E-02	1.46E-01	4.16E-03	3.69E-03	.	
Germanium (32)	Ge-71	2.21E+01	3.13E-02	4.74E+01	9.13E+05	9.65E-01	4.17E+00	5.37E+00	2.59E+00	8.14E-01	1.73E+00	4.90E-02	4.36E-02	5.59E+00	
Germanium (32)	Ge-75	4.40E+03	1.57E-04	1.29E+15	2.57E+15	7.59E+14	2.03E+00	3.05E+00	1.27E+00	6.46E-01	1.37E+00	3.89E-02	3.45E-02	.	
Germanium (32)	Ge-77	5.37E+02	1.29E-03	9.69E+00	1.80E+01	9.73E+01	6.01E-02	8.92E-02	3.77E-02	1.43E-02	5.17E-02	1.23E-03	2.19E-05	1.48E-03	
Germanium (32)	Ge-78	4.14E+03	1.67E-04	2.47E+12	3.40E+12	1.21E+13	1.43E-01	3.51E-01	9.17E-02	6.15E-02	2.22E-01	5.30E-03	9.40E-05	.	
Hydrogen (1)	H-3	5.63E-02	1.23E+01	4.29E-03	1.11E-02	2.23E-03	2.71E-01	3.49E-01	1.69E-01	5.23E-01	9.87E-02	6.02E-02	1.97E-05	1.48E-01	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Hafnium (72)	Hf-167	1.78E+05	3.90E-06	4.63E+04	7.11E+04	2.39E+04	3.29E-02	5.16E-02	2.07E-02	1.38E-02	1.16E-01	3.49E-02	3.96E-02	.	
Hafnium (72)	Hf-169	1.12E+05	6.16E-06	1.80E+03	2.63E+03	9.16E+02	1.50E-02	2.06E-02	9.34E-03	7.67E-03	6.44E-02	3.90E-03	5.71E-02	.	
Hafnium (72)	Hf-170	3.79E+02	1.83E-03	2.89E+00	4.21E+00	1.66E+00	4.44E-02	7.98E-02	2.81E-02	9.85E-03	8.26E-02	1.25E-03	3.13E-01	.	
Hafnium (72)	Hf-172	3.71E-01	1.87E+00	4.47E-03	6.55E-03	2.12E-03	2.48E-03	3.22E-03	1.54E-03	4.89E-03	4.10E-02	5.60E-04	1.39E-01	.	
Hafnium (72)	Hf-173	2.57E+02	2.69E-03	1.63E+01	2.39E+01	7.57E+00	1.70E-02	2.22E-02	1.06E-02	1.75E-02	1.47E-01	2.19E-03	5.49E-01	.	
Hafnium (72)	Hf-174	3.47E-16	2.00E+15	9.71E-03	9.58E-01	1.97E-04	2.28E-05	2.93E-05	1.41E-05	9.42E-04	7.59E-03	8.03E-05	1.90E-02	.	
Hafnium (72)	Hf-175	3.61E+00	1.92E-01	3.10E-01	4.56E-01	1.35E-01	4.21E-02	5.57E-02	2.62E-02	2.72E-02	2.26E-01	2.32E-03	5.65E-01	.	
Hafnium (72)	Hf-177m	7.09E+03	9.78E-05	5.79E+14	7.86E+14	2.94E+15	1.43E-01	4.84E-01	9.26E-02	2.64E-01	2.18E+00	2.25E-02	5.44E+00	.	
Hafnium (72)	Hf-178m	2.24E-02	3.10E+01	6.15E-04	9.31E-04	2.03E-04	7.06E-04	9.12E-04	4.39E-04	4.39E-03	3.63E-02	3.74E-04	9.07E-02	.	
Hafnium (72)	Hf-179m	1.01E+01	6.86E-02	3.17E-01	4.69E-01	1.32E-01	1.37E-02	1.80E-02	8.51E-03	7.80E-03	6.50E-02	6.65E-04	1.62E-01	.	
Hafnium (72)	Hf-180m	1.10E+03	6.28E-04	1.33E+10	1.81E+10	6.61E+10	2.16E-01	4.68E-01	1.38E-01	7.22E-02	6.00E-01	6.15E-03	1.50E+00	.	
Hafnium (72)	Hf-181	5.97E+00	1.16E-01	3.04E-01	4.53E-01	1.14E-01	1.06E-02	1.38E-02	6.62E-03	8.08E-03	6.74E-02	6.89E-04	1.68E-01	1.85E+01	
Hafnium (72)	Hf-182	7.70E-08	9.00E+06	6.10E-04	9.35E-04	1.87E-04	6.27E-04	8.09E-04	3.90E-04	4.27E-03	3.55E-02	9.26E-04	3.70E-02	2.89E+00	
Hafnium (72)	Hf-182m	5.92E+03	1.17E-04	1.87E+02	2.75E+02	9.49E+01	1.30E-03	1.69E-03	8.09E-04	5.33E-03	4.45E-02	1.88E-03	4.04E-02	2.89E+00	
Hafnium (72)	Hf-183	5.69E+03	1.22E-04	6.36E+02	9.77E+02	2.98E+02	2.32E-02	3.13E-02	1.44E-02	5.86E-03	4.93E-02	6.60E-03	3.92E-02	.	
Hafnium (72)	Hf-184	1.47E+03	4.70E-04	5.67E+08	9.42E+07	2.46E+09	5.30E-02	8.41E-02	3.33E-02	8.11E-03	6.79E-02	1.44E-03	7.71E-02	.	
Mercury (80)	Hg-190	1.82E+04	3.81E-05	1.22E+13	2.32E+15	7.35E+12	8.51E-06	1.10E-05	5.29E-06	5.12E-04	3.13E-03	1.76E-03	1.91E-04	.	
Mercury (80)	Hg-191m	7.17E+03	9.67E-05	5.82E+02	1.20E+03	3.44E+02	5.33E-02	9.12E-02	3.36E-02	2.14E-02	1.03E-01	6.49E-03	3.11E-03	2.69E-01	
Mercury (80)	Hg-192	1.25E+03	5.54E-04	7.73E+08	1.05E+09	3.94E+09	4.49E-02	7.31E-02	2.83E-02	3.33E-02	1.19E-01	1.62E-03	8.67E-01	.	
Mercury (80)	Hg-193	1.60E+03	4.34E-04	3.65E+02	5.54E+02	7.68E+03	3.87E-02	5.40E-02	2.42E-02	3.75E-02	1.70E-01	2.77E-03	2.47E-02	2.69E+00	
Mercury (80)	Hg-193m	5.14E+02	1.35E-03	8.19E+00	1.45E+01	6.02E+01	1.69E-02	2.29E-02	1.06E-02	1.74E-02	5.68E-02	8.11E-04	2.35E-02	2.69E+00	
Mercury (80)	Hg-194	1.58E-03	4.40E+02	6.74E-04	1.38E-03	2.39E-04	3.03E-03	3.93E-03	1.88E-03	1.20E-02	4.17E-02	5.67E-04	2.99E-01	.	
Mercury (80)	Hg-195	5.77E+02	1.20E-03	4.34E+02	1.09E+02	2.06E+02	1.95E-02	2.54E-02	1.21E-02	2.48E-02	1.33E-01	1.83E-03	1.34E+00	.	
Mercury (80)	Hg-195m	1.46E+02	4.75E-03	4.66E+00	1.88E+01	2.70E+00	6.27E-03	8.11E-03	3.90E-03	1.00E-02	3.30E-02	4.46E-04	2.29E-01	.	
Mercury (80)	Hg-197	9.35E+01	7.41E-03	9.79E+00	1.25E+02	6.01E+00	1.47E-02	1.90E-02	9.15E-03	3.37E-02	8.85E-02	1.19E-03	5.57E-01	2.10E+02	
Mercury (80)	Hg-197m	2.55E+02	2.72E-03	9.10E+00	1.11E+02	5.58E+00	6.77E-03	8.74E-03	4.21E-03	1.16E-02	3.03E-02	4.06E-04	1.91E-01	8.69E+01	
Mercury (80)	Hg-199m	8.54E+03	8.12E-05	3.05E+16	4.43E+16	1.57E+17	3.32E-01	4.78E-01	2.08E-01	8.04E-01	2.10E+00	2.83E-02	1.33E+01	.	
Mercury (80)	Hg-203	5.43E+00	1.28E-01	2.15E-01	9.56E-01	1.26E-01	9.33E-03	1.21E-02	5.80E-03	1.68E-02	4.41E-02	5.91E-04	2.78E-01	1.40E+01	
Mercury (80)	Hg-205	7.00E+04	9.89E-06	2.94E+23	3.98E+23	1.50E+24	4.96E+01	2.17E+02	3.23E+01	.	8.88E+05	5.66E+05	5.60E+06	.	
Mercury (80)	Hg-206	4.47E+04	1.55E-05	9.02E+20	1.22E+21	4.60E+21	2.94E+00	1.28E+01	1.91E+00	.	4.85E+04	3.09E+04	2.93E+05	.	
Mercury (80)	Hg-207	1.26E+05	5.52E-06	5.09E+23	6.91E+23	2.59E+24	1.23E-01	5.38E-01	8.01E-02	.	2.03E+03	1.29E+03	1.27E+04	.	
Holmium (67)	Ho-150	2.85E+05	2.44E-06	7.42E+03	1.09E+04	3.81E+03	1.06E-05	1.36E-05	6.59E-06	8.46E-04	6.95E-03	1.63E-04	5.70E-03	.	
Holmium (67)	Ho-153	1.81E+05	3.82E-06	1.47E+04	2.17E+04	7.49E+03	2.01E-02	2.85E-02	1.26E-02	1.41E-02	1.18E-01	1.03E-02	1.41E-01	1.44E+01	
Holmium (67)	Ho-153m	3.92E+04	1.77E-05	3.18E+03	4.68E+03	1.62E+03	2.01E-02	2.84E-02	1.25E-02	1.41E-02	1.18E-01	1.02E-02	1.41E-01	1.45E+01	
Holmium (67)	Ho-154	3.10E+04	2.24E-05	2.90E+09	1.65E+11	1.26E+08	5.87E-06	7.56E-06	3.65E-06	5.26E-04	4.31E-03	1.30E-04	3.87E-03	.	
Holmium (67)	Ho-154m	1.17E+05	5.90E-06	1.10E+10	9.96E+11	4.77E+08	5.87E-06	7.56E-06	3.65E-06	5.26E-04	4.31E-03	1.30E-04	3.87E-03	.	
Holmium (67)	Ho-155	7.59E+03	9.13E-05	1.92E+03	2.85E+03	9.69E+02	9.12E-02	1.57E-01	5.76E-02	2.53E-02	2.12E-01	1.28E-02	6.01E-01	.	
Holmium (67)	Ho-156	6.50E+03	1.07E-04	6.77E+14	9.19E+14	3.45E+15	1.49E-01	5.45E-01	9.64E-02	2.18E-01	1.82E+00	7.38E-01	1.69E+00	.	
Holmium (67)	Ho-157	2.89E+04	2.40E-05	3.36E+06	7.19E+06	8.98E+05	5.28E-02	7.47E-02	3.30E-02	1.16E-01	9.74E-01	5.24E-02	2.17E+00	.	
Holmium (67)	Ho-159	1.10E+04	6.29E-05	3.45E+04	5.54E+04	1.04E+04	1.16E-01	1.63E-01	7.26E-02	9.20E-02	7.73E-01	3.45E-02	1.14E+00	.	
Holmium (67)	Ho-160	1.42E+04	4.87E-05	4.97E+16	6.75E+16	2.53E+17	2.03E-01	8.45E-01	1.32E-01	1.40E+00	1.16E+01	4.72E+00	1.08E+01	.	
Holmium (67)	Ho-161	2.45E+03	2.83E-04	4.38E+14	5.98E+14	2.23E+15	5.58E+00	1.03E+01	3.53E+00	1.06E+00	8.89E+00	3.60E+00	8.27E+00	.	
Holmium (67)	Ho-162	2.43E+04	2.85E-05	4.40E+19	5.97E+19	2.24E+20	2.32E+00	8.89E+00	1.50E+00	9.42E+00	7.80E+01	3.17E+01	7.25E+01	.	
Holmium (67)	Ho-162m	5.44E+03	1.27E-04	3.71E+14	5.04E+14	1.89E+15	4.85E-01	1.65E+00	3.14E-01	7.16E-01	5.96E+00	2.42E+00	5.54E+00	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water Total PRG TR=1E-06 (Bq/L)			
Holmium (67)	Ho-163	1.52E-04	4.57E+03	3.90E+01	7.29E+03	9.36E+00	1.92E-01	2.48E-01	1.20E-01	2.86E+00	2.40E+01	9.73E+00	2.24E+01	.	
Holmium (67)	Ho-164	1.26E+04	5.52E-05	3.01E+20	4.11E+20	1.53E+21	8.41E+00	1.45E+01	5.31E+00	3.09E+00	2.57E+01	1.04E+01	2.39E+01	.	
Holmium (67)	Ho-164m	9.59E+03	7.23E-05	4.27E+17	5.82E+17	2.17E+18	2.91E+00	4.76E+00	1.83E+00	8.97E-01	7.49E+00	3.04E+00	6.97E+00	.	
Holmium (67)	Ho-166	2.27E+02	3.06E-03	1.42E+02	3.04E+02	6.51E+01	5.67E-02	7.33E-02	3.53E-02	5.56E-03	4.68E-02	1.89E-02	4.35E-02	3.10E+00	
Holmium (67)	Ho-166m	5.78E-04	1.20E+03	6.00E-04	9.14E-04	2.01E-04	3.00E-04	3.86E-04	1.86E-04	6.38E-03	5.33E-02	2.16E-02	4.96E-02	.	
Holmium (67)	Ho-167	1.96E+03	3.54E-04	6.05E+12	8.23E+12	3.08E+13	4.80E-01	9.30E-01	3.05E-01	1.36E-01	1.14E+00	4.61E-01	1.06E+00	.	
Holmium (67)	Ho-168	1.22E+05	5.69E-06	1.42E+23	1.93E+23	7.24E+23	3.94E-01	1.72E+00	2.56E-01	.	6.50E+03	4.14E+03	6.04E+03	.	
Holmium (67)	Ho-168m	1.66E+05	4.19E-06	6.66E+22	9.04E+22	3.39E+23	3.92E-01	1.71E+00	2.55E-01	.	6.47E+03	4.12E+03	6.02E+03	.	
Holmium (67)	Ho-170	1.32E+05	5.25E-06	7.27E+22	9.79E+22	3.70E+23	2.03E-01	8.85E-01	1.32E-01	.	3.34E+03	2.13E+03	3.11E+03	.	
Iodine (53)	I-118	2.66E+04	2.61E-05	2.97E+02	1.22E+03	1.78E+02	1.53E-02	2.16E-02	9.56E-03	2.85E-03	1.05E-02	2.76E-03	1.29E-04	.	
Iodine (53)	I-118m	4.29E+04	1.62E-05	4.78E+02	1.97E+03	2.88E+02	1.47E-02	2.20E-02	9.24E-03	2.93E-03	1.07E-02	2.80E-03	5.05E-03	.	
Iodine (53)	I-119	1.91E+04	3.63E-05	5.69E+02	8.88E+02	3.15E+03	1.30E-01	2.94E-01	8.28E-02	4.14E-02	2.00E-01	3.58E-02	7.20E-04	.	
Iodine (53)	I-120	4.46E+03	1.55E-04	2.22E+13	3.03E+13	1.13E+14	8.19E-02	1.98E-01	5.24E-02	7.09E-02	4.40E-01	1.43E-01	8.80E-05	.	
Iodine (53)	I-120m	6.87E+03	1.01E-04	2.69E+14	3.66E+14	1.37E+15	8.11E-02	2.54E-01	5.23E-02	1.52E-01	9.40E-01	3.06E-01	1.88E-04	.	
Iodine (53)	I-121	2.86E+03	2.42E-04	1.06E+02	1.88E+02	5.71E+01	7.93E-02	1.20E-01	4.97E-02	3.16E-02	1.21E-01	3.21E-02	3.30E-04	.	
Iodine (53)	I-122	1.00E+05	6.91E-06	1.58E+23	2.15E+23	8.07E+23	3.66E-01	1.60E+00	2.38E-01	.	6.04E+03	3.85E+03	1.21E+00	.	
Iodine (53)	I-123	4.57E+02	1.51E-03	8.74E+01	1.44E+02	3.81E+05	5.74E-02	7.51E-02	3.57E-02	3.25E-02	1.42E-01	3.99E-02	9.35E-05	.	
Iodine (53)	I-124	6.06E+01	1.14E-02	7.31E-01	1.90E+00	3.62E-01	4.97E-03	6.47E-03	3.09E-03	1.28E-03	7.98E-03	2.59E-03	1.60E-06	.	
Iodine (53)	I-125	4.26E+00	1.63E-01	1.98E-01	7.55E+01	9.35E-02	8.26E-03	1.06E-02	5.13E-03	2.18E-03	1.35E-02	4.39E-03	2.69E-06	.	
Iodine (53)	I-126	1.96E+01	3.54E-02	2.09E-01	1.68E+00	9.99E-02	2.37E-03	3.06E-03	1.48E-03	6.07E-04	3.78E-03	1.23E-03	7.56E-07	2.22E-05	
Iodine (53)	I-128	1.46E+04	4.75E-05	1.62E+18	2.25E+18	8.22E+18	9.07E-01	1.34E+00	5.68E-01	6.76E-01	4.19E+00	1.36E+00	8.38E-04	.	
Iodine (53)	I-129	4.41E-08	1.57E+07	3.15E-04	3.42E-01	9.66E-05	1.41E-03	1.81E-03	8.74E-04	3.83E-04	2.35E-03	7.68E-04	4.70E-07	7.40E-06	
Iodine (53)	I-130	4.91E+02	1.41E-03	5.34E+00	8.24E+00	1.61E+08	2.76E-02	4.04E-02	1.73E-02	8.81E-03	5.49E-02	1.78E-02	1.10E-05	.	
Iodine (53)	I-130m	4.12E+04	1.68E-05	2.48E+07	1.89E+07	1.59E+10	3.25E-02	4.79E-02	2.04E-02	1.05E-02	6.53E-02	2.12E-02	1.31E-05	.	
Iodine (53)	I-131	3.15E+01	2.20E-02	5.78E-01	3.19E+00	2.79E-01	4.54E-03	5.87E-03	2.83E-03	1.16E-03	7.25E-03	3.52E-03	1.45E-06	2.22E-05	
Iodine (53)	I-132	2.65E+03	2.62E-04	1.56E+12	2.13E+12	7.93E+12	8.63E-02	1.86E-01	5.50E-02	6.48E-02	4.02E-01	1.31E-01	8.05E-05	6.66E-04	
Iodine (53)	I-132m	4.38E+03	1.58E-04	1.26E+12	1.72E+12	6.39E+12	7.90E-02	1.61E-01	5.02E-02	5.97E-02	3.71E-01	1.21E-01	7.41E-05	7.74E-04	
Iodine (53)	I-133	2.92E+02	2.37E-03	7.67E+00	1.69E+01	3.83E+00	1.37E-02	1.80E-02	8.53E-03	3.62E-03	2.26E-02	7.34E-03	4.52E-06	7.40E-05	
Iodine (53)	I-134	6.94E+03	9.99E-05	3.69E+14	5.02E+14	1.88E+15	1.06E-01	3.14E-01	6.80E-02	2.32E-01	1.44E+00	4.69E-01	2.88E-04	7.40E-04	
Iodine (53)	I-134m	1.01E+05	6.85E-06	5.13E+15	6.98E+15	2.62E+16	1.00E-01	3.05E-01	6.45E-02	2.38E-01	1.47E+00	4.80E-01	2.94E-04	7.57E-04	
Iodine (53)	I-135	9.24E+02	7.50E-04	4.07E+07	8.58E+07	2.96E+04	5.99E-03	7.90E-03	3.73E-03	6.34E-03	4.26E-02	9.21E-04	2.23E-05	2.22E-04	
Indium (49)	In-103	3.64E+05	1.90E-06	1.55E+05	4.61E+07	1.34E+05	4.00E-02	9.91E-02	2.56E-02	3.79E-02	1.83E-01	7.52E-02	2.84E-02	2.63E+00	
Indium (49)	In-105	7.18E+04	9.65E-06	3.13E+03	5.55E+03	7.81E+02	4.03E-02	7.54E-02	2.56E-02	2.89E-02	1.13E-01	1.36E-02	9.75E-04	4.23E+00	
Indium (49)	In-106	5.87E+04	1.18E-05	1.86E+20	2.53E+20	9.49E+20	9.70E-02	4.24E-01	6.31E-02	.	1.61E+03	1.02E+03	7.72E+02	.	
Indium (49)	In-106m	7.00E+04	9.89E-06	5.29E+20	7.19E+20	2.70E+21	1.18E-01	5.14E-01	7.65E-02	.	1.94E+03	1.23E+03	9.29E+02	.	
Indium (49)	In-107	1.12E+04	6.16E-05	6.03E+11	9.48E+12	1.02E+11	1.61E-01	4.34E-01	1.04E-01	1.13E-01	2.32E-01	1.06E-02	2.94E-04	.	
Indium (49)	In-108	6.28E+03	1.10E-04	1.12E+16	1.52E+16	5.56E+16	8.45E-02	3.44E-01	5.48E-02	2.67E-01	2.24E+00	6.75E-03	1.07E+00	.	
Indium (49)	In-108m	9.20E+03	7.53E-05	2.06E+15	2.79E+15	1.02E+16	1.12E-01	4.51E-01	7.29E-02	3.00E-01	2.52E+00	7.60E-03	1.21E+00	.	
Indium (49)	In-109	1.45E+03	4.79E-04	3.13E+01	2.59E+04	4.90E-01	1.03E-02	1.34E-02	6.38E-03	1.08E-02	1.86E-02	2.77E-03	2.25E-05	2.66E-02	
Indium (49)	In-109m	2.72E+05	2.55E-06	5.89E+03	4.87E+06	9.22E+01	1.01E-02	1.33E-02	6.27E-03	1.08E-02	1.86E-02	2.77E-03	2.25E-05	2.66E-02	
Indium (49)	In-110	1.24E+03	5.59E-04	4.38E+10	5.96E+10	2.00E+11	9.82E-02	3.34E-01	6.35E-02	7.04E-02	5.92E-01	1.78E-03	2.84E-01	.	
Indium (49)	In-110m	5.27E+03	1.31E-04	1.65E+14	2.24E+14	7.75E+14	1.95E-01	6.82E-01	1.26E-01	1.88E-01	1.59E+00	4.77E-03	7.64E-01	.	
Indium (49)	In-111	9.02E+01	7.68E-03	7.03E+00	1.03E+01	1.19E+00	2.08E-01	3.17E-01	1.31E-01	4.05E-02	3.43E-01	1.02E-03	1.64E-01	.	
Indium (49)	In-111m	4.73E+04	1.46E-05	3.68E+03	5.37E+03	6.25E+02	1.63E-01	2.89E-01	1.03E-01	4.05E-02	3.43E-01	1.02E-03	1.64E-01	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Indium (49)	In-112	2.43E+04	2.85E-05	2.42E+19	3.29E+19	1.20E+20	1.26E+00	4.75E+00	8.16E-01	3.11E+00	2.61E+01	7.88E-02	1.25E+01	.	
Indium (49)	In-112m	1.77E+04	3.91E-05	3.23E+17	4.38E+17	1.57E+18	9.81E-01	2.83E+00	6.31E-01	1.08E+00	9.08E+00	2.73E-02	4.36E+00	.	
Indium (49)	In-113m	3.66E+03	1.89E-04	8.98E+13	1.22E+14	3.81E+14	1.05E+00	2.84E+00	6.74E-01	5.49E-01	4.65E+00	1.39E-02	2.23E+00	5.33E+01	
Indium (49)	In-114	3.04E+05	2.28E-06	5.75E+27	7.69E+27	2.93E+28	5.62E+01	2.46E+02	3.66E+01	.	1.11E+06	7.07E+05	5.33E+05	.	
Indium (49)	In-114m	5.11E+00	1.36E-01	1.47E+00	2.60E+00	5.11E-03	4.56E-03	5.88E-03	2.84E-03	2.07E-03	1.76E-02	5.23E-05	8.43E-03	1.07E+00	
Indium (49)	In-115	1.57E-15	4.41E+14	5.34E-02	1.72E+00	2.12E-05	5.65E-04	7.27E-04	3.51E-04	1.74E-03	1.43E-02	4.40E-05	6.88E-03	5.33E+00	
Indium (49)	In-115m	1.35E+03	5.12E-04	3.29E+11	4.47E+11	6.23E+11	5.94E-04	7.65E-04	3.69E-04	1.80E-03	1.49E-02	4.56E-05	7.13E-03	4.26E+00	
Indium (49)	In-116m	6.69E+03	1.04E-04	3.82E+14	5.18E+14	1.89E+15	1.27E-01	4.93E-01	8.22E-02	3.31E-01	2.79E+00	8.39E-03	1.34E+00	.	
Indium (49)	In-117	8.43E+03	8.22E-05	8.33E+04	8.22E+05	4.40E+04	4.27E-01	1.31E+00	2.75E-01	6.29E-01	3.73E+00	1.83E-02	2.56E+00	.	
Indium (49)	In-117m	3.13E+03	2.21E-04	6.53E+04	6.45E+05	3.45E+04	4.12E-01	7.97E-01	2.62E-01	1.08E-01	8.86E-01	2.77E-03	4.40E-01	.	
Indium (49)	In-118	4.37E+06	1.59E-07	2.02E+33	2.70E+33	1.03E+34	3.45E+00	1.51E+01	2.24E+00	.	5.91E+04	3.77E+04	2.84E+04	.	
Indium (49)	In-118m	8.35E+04	8.30E-06	2.38E+21	3.24E+21	1.21E+22	1.21E-01	5.29E-01	7.87E-02	.	1.99E+03	1.27E+03	9.58E+02	.	
Indium (49)	In-119	1.52E+05	4.57E-06	1.28E+06	1.56E+09	6.79E+05	3.67E-01	1.11E+00	2.37E-01	2.41E+00	6.31E+00	1.94E-01	1.01E+01	.	
Indium (49)	In-119m	2.02E+04	3.42E-05	3.05E+06	3.71E+09	1.62E+06	1.95E+00	4.61E+00	1.24E+00	7.17E-01	5.81E+00	1.84E-02	2.89E+00	.	
Indium (49)	In-121	9.46E+05	7.32E-07	1.15E+05	7.35E+08	4.82E+05	3.47E-02	4.79E-02	2.17E-02	2.94E-02	7.72E-02	2.37E-03	1.24E-01	.	
Indium (49)	In-121m	9.39E+04	7.38E-06	1.11E+04	8.09E+07	3.98E+06	1.89E-01	2.51E-01	1.18E-01	3.38E-02	8.86E-02	2.72E-03	1.42E-01	.	
Iridium (77)	Ir-180	2.43E+05	2.85E-06	2.78E+18	3.78E+18	1.42E+19	1.20E-01	5.06E-01	7.77E-02	1.43E+00	9.82E+00	5.98E+00	2.96E+00	.	
Iridium (77)	Ir-182	2.43E+04	2.85E-05	3.50E+02	5.47E+02	2.38E+02	5.52E-02	1.07E-01	3.51E-02	1.43E-02	7.91E-02	4.76E-02	1.32E-03	.	
Iridium (77)	Ir-183	6.28E+03	1.10E-04	4.14E+02	7.83E+02	2.63E+02	1.57E-02	2.18E-02	9.81E-03	1.18E-02	4.61E-02	2.75E-02	3.92E-04	.	
Iridium (77)	Ir-184	1.96E+03	3.53E-04	1.27E+12	1.74E+12	6.32E+12	1.37E-01	3.94E-01	8.84E-02	7.22E-02	5.01E-01	2.61E-01	1.60E-03	.	
Iridium (77)	Ir-185	4.22E+02	1.64E-03	6.60E+00	9.90E+00	7.93E+00	2.94E-02	4.18E-02	1.84E-02	1.54E-02	1.07E-01	6.03E-02	7.31E-04	3.33E+00	
Iridium (77)	Ir-186	3.65E+02	1.90E-03	5.29E+00	7.86E+00	2.46E+00	1.92E-05	2.47E-05	1.19E-05	6.95E-04	4.76E-03	2.88E-03	3.87E-04	.	
Iridium (77)	Ir-186m	3.16E+03	2.19E-04	1.83E+02	2.73E+02	2.09E+07	1.92E-05	2.47E-05	1.19E-05	7.11E-04	4.86E-03	2.95E-03	8.32E-04	.	
Iridium (77)	Ir-187	5.78E+02	1.20E-03	2.82E+07	7.30E+01	3.15E+09	4.75E-01	8.68E-01	3.01E-01	9.51E-02	6.60E-01	3.45E-01	2.11E-03	.	
Iridium (77)	Ir-188	1.46E+02	4.74E-03	1.46E+00	2.27E+00	7.26E-01	7.68E-02	1.52E-01	4.88E-02	1.87E-02	1.29E-01	6.75E-02	4.13E-04	.	
Iridium (77)	Ir-189	1.92E+01	3.62E-02	8.49E+00	1.94E+01	1.50E+00	1.04E-01	1.36E-01	6.48E-02	3.58E-02	2.50E-01	1.30E-01	8.02E-04	.	
Iridium (77)	Ir-190	2.15E+01	3.23E-02	3.69E-01	5.60E-01	1.56E-01	3.73E-02	5.39E-02	2.34E-02	1.22E-02	8.45E-02	4.41E-02	2.70E-04	7.10E-02	
Iridium (77)	Ir-190m	5.42E+03	1.28E-04	9.28E+01	1.41E+02	3.93E+01	3.72E-02	5.36E-02	2.33E-02	1.21E-02	8.40E-02	4.39E-02	2.69E-04	7.10E-02	
Iridium (77)	Ir-190n	1.97E+03	3.52E-04	3.89E+02	5.97E+02	1.66E+02	1.34E-01	3.01E-01	8.57E-02	6.55E-02	4.54E-01	2.37E-01	1.45E-03	8.26E-01	
Iridium (77)	Ir-191m	4.42E+06	1.57E-07	6.20E+33	8.35E+33	3.16E+34	6.23E+00	2.72E+01	4.05E+00	.	9.97E+04	6.35E+04	3.19E+02	.	
Iridium (77)	Ir-192	3.43E+00	2.02E-01	9.91E-02	1.64E-01	3.11E-02	9.34E-03	1.22E-02	5.81E-03	7.04E-03	4.90E-02	2.56E-02	1.57E-04	1.18E-02	
Iridium (77)	Ir-192m	2.51E+05	2.76E-06	7.27E+03	1.20E+04	2.28E+03	9.34E-03	1.22E-02	5.81E-03	7.04E-03	4.90E-02	2.56E-02	1.57E-04	1.18E-02	
Iridium (77)	Ir-192n	2.88E-03	2.41E+02	1.06E-03	1.99E-03	1.81E-04	1.26E-03	1.63E-03	7.86E-04	4.11E-03	2.86E-02	1.49E-02	9.15E-05	1.18E-02	
Iridium (77)	Ir-193m	2.40E+01	2.88E-02	2.14E+01	7.10E+03	1.75E+00	5.13E-02	6.61E-02	3.19E-02	2.63E-02	1.83E-01	9.55E-02	5.86E-04	.	
Iridium (77)	Ir-194	3.15E+02	2.20E-03	3.65E+01	1.24E+02	4.64E+00	6.62E-02	8.63E-02	4.12E-02	5.95E-03	4.15E-02	2.16E-02	1.33E-04	1.07E-02	
Iridium (77)	Ir-194m	1.48E+00	4.68E-01	1.55E-02	2.37E-02	6.32E-03	5.09E-03	6.71E-03	3.17E-03	6.26E-03	4.34E-02	2.27E-02	1.39E-04	.	
Iridium (77)	Ir-195	2.43E+03	2.85E-04	1.22E+14	2.03E+14	3.16E+14	8.61E-01	1.20E+00	5.37E-01	1.30E-01	9.08E-01	4.74E-01	2.91E-03	.	
Iridium (77)	Ir-195m	1.60E+03	4.34E-04	4.08E+02	4.65E+03	3.43E+02	8.42E-02	1.16E-01	5.25E-02	2.04E-02	1.08E-01	6.38E-02	1.11E-03	.	
Iridium (77)	Ir-196	4.20E+05	1.65E-06	6.16E+26	8.25E+26	3.14E+27	1.45E+00	6.34E+00	9.44E-01	.	2.42E+04	1.54E+04	7.74E+01	.	
Iridium (77)	Ir-196m	4.34E+03	1.60E-04	2.41E+13	3.28E+13	1.22E+14	1.28E-01	4.36E-01	8.25E-02	1.64E-01	1.13E+00	5.93E-01	3.63E-03	.	
Potassium (19)	K-38	4.77E+04	1.45E-05	7.12E+19	9.66E+19	3.63E+20	1.01E-01	4.41E-01	6.56E-02	.	1.67E+03	1.06E+03	2.21E+01	.	
Potassium (19)	K-40	5.54E-10	1.25E+09	2.15E-04	8.10E-03	1.80E-06	1.03E-03	1.33E-03	6.43E-04	2.20E-03	4.69E-03	1.34E-04	6.19E-05	.	
Potassium (19)	K-42	4.91E+02	1.41E-03	2.24E+01	5.41E+01	3.95E+07	1.59E-01	2.27E-01	9.92E-02	7.33E-02	9.22E-02	2.64E-03	1.22E-03	4.40E-01	
Potassium (19)	K-43	2.72E+02	2.55E-03	6.32E+00	1.05E+01	5.42E-01	1.35E-01	2.34E-01	8.51E-02	7.14E-02	1.52E-01	4.35E-03	2.00E-03	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water Total PRG TR=1E-06 (Bq/L)			
Potassium (19)	K-44	1.65E+04	4.21E-05	1.38E+17	1.89E+17	5.23E+17	1.28E-01	5.15E-01	8.28E-02	3.98E-01	8.47E-01	2.43E-02	1.12E-02	.	
Potassium (19)	K-45	2.11E+04	3.29E-05	1.49E+03	1.66E+07	1.75E+02	1.62E-02	2.23E-02	4.67E-01	2.17E-02	5.24E-02	1.51E-02	4.35E-04	3.03E-03	
Potassium (19)	K-46	2.08E+05	3.33E-06	6.74E+23	9.08E+23	3.44E+24	1.07E-01	4.67E-01	6.94E-02	1.77E+03	1.13E+03	2.34E+01	.	.	
Krypton (36)	Kr-74	3.17E+04	2.19E-05	2.08E+16	2.83E+16	1.04E+17	5.60E-02	2.36E-01	3.64E-02	3.76E-01	2.74E+00	5.11E-02	1.52E-01	.	
Krypton (36)	Kr-75	8.49E+04	8.16E-06	5.79E+02	9.65E+03	5.07E+01	3.34E-02	5.30E-02	2.10E-02	6.95E-03	7.06E-03	2.50E-04	1.40E-03	6.67E+00	
Krypton (36)	Kr-76	4.10E+02	1.69E-03	2.94E+00	4.30E+00	1.24E+00	6.85E-02	1.65E-01	4.38E-02	3.85E-02	2.82E-01	5.24E-03	1.56E-02	.	
Krypton (36)	Kr-77	4.90E+03	1.42E-04	4.02E+02	5.91E+02	1.16E+02	2.11E-01	6.21E-01	1.36E-01	1.83E-01	1.34E+00	2.49E-02	7.37E-02	.	
Krypton (36)	Kr-79	1.73E+02	4.00E-03	1.81E+01	2.63E+01	9.29E+00	1.43E+00	6.24E+00	9.29E-01	.	2.36E+04	1.50E+04	.	.	
Krypton (36)	Kr-81	3.03E-06	2.29E+05	1.31E+00	1.99E+00	4.39E-01	4.24E+02	1.85E+03	2.75E+02	.	6.93E+06	4.42E+06	.	.	
Krypton (36)	Kr-81m	1.67E+06	4.15E-07	7.25E+11	1.10E+12	2.42E+11	2.88E+00	1.26E+01	1.87E+00	.	4.70E+04	2.99E+04	.	.	
Krypton (36)	Kr-83m	3.32E+03	2.09E-04	5.69E+18	7.72E+18	2.90E+19	1.82E+04	7.95E+04	1.18E+04	.	2.81E+08	1.79E+08	.	.	
Krypton (36)	Kr-85	6.44E-02	1.08E+01	8.30E-01	1.23E+00	3.75E-01	1.26E+02	5.50E+02	8.18E+01	.	2.24E+06	1.43E+06	.	.	
Krypton (36)	Kr-85m	1.36E+03	5.11E-04	8.15E+04	1.21E+05	3.69E+04	2.38E+00	1.04E+01	1.55E+00	.	3.87E+04	2.47E+04	.	.	
Krypton (36)	Kr-87	4.77E+03	1.45E-04	7.26E+11	2.45E+14	2.18E+10	5.07E-03	6.59E-03	3.15E-03	1.03E-02	3.55E-02	3.42E-04	7.47E-03	2.33E+00	
Krypton (36)	Kr-88	2.14E+03	3.24E-04	2.59E+11	3.53E+11	1.26E+12	1.17E-01	4.79E-01	7.61E-02	3.91E-01	1.35E+00	1.30E-02	2.85E-01	.	
Krypton (36)	Kr-89	1.16E+05	5.99E-06	1.49E+03	2.36E+06	1.34E+01	6.90E-03	9.49E-03	4.31E-03	4.07E-03	9.89E-03	1.82E-03	1.19E-05	8.88E-04	
Lanthanum (57)	La-128	7.03E+04	9.86E-06	1.78E+03	2.79E+03	5.05E+00	2.22E-02	3.44E-02	1.39E-02	3.28E-03	2.62E-02	3.52E-03	1.57E-05	.	
Lanthanum (57)	La-129	3.14E+04	2.21E-05	3.33E+03	4.89E+03	3.14E+02	1.65E-01	4.39E-01	1.06E-01	1.29E-01	9.83E-01	2.58E-02	1.30E-03	.	
Lanthanum (57)	La-130	4.19E+04	1.66E-05	4.32E+19	5.87E+19	2.20E+20	1.54E-01	6.73E-01	1.00E-01	.	2.54E+03	1.62E+03	1.35E+04	.	
Lanthanum (57)	La-131	6.17E+03	1.12E-04	3.61E+02	5.41E+02	3.31E+00	5.46E-02	7.97E-02	3.42E-02	2.30E-02	1.81E-01	1.36E-02	1.23E-04	1.33E-02	
Lanthanum (57)	La-132	1.26E+03	5.48E-04	1.09E+11	1.48E+11	5.55E+11	1.11E-01	2.68E-01	7.13E-02	2.74E-02	2.27E-01	1.28E-02	1.21E+00	.	
Lanthanum (57)	La-132m	1.50E+04	4.62E-05	1.56E+12	2.11E+12	7.92E+12	1.12E-01	2.88E-01	7.16E-02	3.27E-02	2.71E-01	1.52E-02	1.44E+00	.	
Lanthanum (57)	La-133	1.55E+03	4.47E-04	1.35E+02	2.17E+02	2.92E-01	6.91E-03	8.96E-03	4.30E-03	7.78E-03	6.15E-02	8.11E-03	3.77E-05	.	
Lanthanum (57)	La-134	5.65E+04	1.23E-05	6.08E+20	8.26E+20	3.10E+21	4.93E-01	2.15E+00	3.20E-01	.	8.14E+03	5.18E+03	4.31E+04	.	
Lanthanum (57)	La-135	3.11E+02	2.23E-03	6.55E+02	9.78E+02	3.31E+02	3.63E+00	5.29E+00	2.27E+00	3.57E-01	2.97E+00	1.66E-01	1.57E+01	.	
Lanthanum (57)	La-136	3.69E+04	1.88E-05	9.58E+19	1.30E+20	4.88E+20	8.95E-01	3.91E+00	5.82E-01	.	1.48E+04	9.40E+03	7.83E+04	.	
Lanthanum (57)	La-137	1.16E-05	6.00E+04	4.31E-01	9.42E-01	1.18E-01	1.62E-02	2.08E-02	1.01E-02	1.49E-01	1.23E+00	6.92E-02	6.53E+00	.	
Lanthanum (57)	La-138	6.79E-12	1.02E+11	7.04E-04	1.07E-03	2.35E-04	7.54E-04	9.72E-04	4.68E-04	1.52E-02	1.25E-01	7.08E-03	6.64E-01	.	
Lanthanum (57)	La-140	1.51E+02	4.60E-03	1.45E+00	2.13E+00	7.43E-01	3.46E-02	5.37E-02	2.17E-02	4.74E-03	3.95E-02	2.21E-03	2.09E-01	1.18E+01	
Lanthanum (57)	La-141	1.55E+03	4.47E-04	6.51E+02	1.10E+03	1.77E+02	1.59E-02	2.06E-02	9.90E-03	7.80E-03	6.51E-02	3.25E-03	1.01E-01	1.33E+01	
Lanthanum (57)	La-142	4.00E+03	1.73E-04	1.06E+14	1.44E+14	5.42E+14	1.16E-01	3.90E-01	7.49E-02	9.51E-02	7.87E-01	4.43E-02	4.17E+00	.	
Lanthanum (57)	La-143	2.57E+04	2.70E-05	2.31E+03	3.85E+03	8.64E+02	1.61E-02	2.11E-02	1.00E-02	3.38E-03	2.80E-02	2.24E-03	2.34E-02	1.56E+00	
Lutetium (71)	Lu-165	3.39E+04	2.04E-05	1.66E+03	2.43E+03	8.64E+02	1.03E-01	2.24E-01	6.59E-02	2.90E-02	2.43E-01	8.56E-02	8.42E-02	.	
Lutetium (71)	Lu-167	7.07E+03	9.80E-05	1.84E+03	2.84E+03	9.58E+02	3.49E-02	5.27E-02	2.19E-02	1.38E-02	1.16E-01	3.49E-02	3.96E-02	.	
Lutetium (71)	Lu-169	1.78E+02	3.89E-03	2.85E+00	4.17E+00	1.45E+00	1.54E-02	2.08E-02	9.58E-03	7.67E-03	6.44E-02	3.90E-03	5.71E-02	.	
Lutetium (71)	Lu-169m	1.37E+05	5.07E-06	2.18E+03	3.20E+03	1.11E+03	1.54E-02	2.08E-02	9.58E-03	7.67E-03	6.44E-02	3.90E-03	5.71E-02	.	
Lutetium (71)	Lu-170	1.26E+02	5.51E-03	1.08E+00	1.57E+00	5.50E-01	5.94E-02	1.15E-01	3.77E-02	1.47E-02	1.24E-01	2.47E-03	6.33E-01	.	
Lutetium (71)	Lu-171	3.07E+01	2.26E-02	1.27E+00	1.85E+00	6.27E-01	5.36E-02	7.39E-02	3.34E-02	1.52E-02	1.28E-01	2.54E-03	6.55E-01	.	
Lutetium (71)	Lu-171m	2.77E+05	2.51E-06	1.14E+04	1.67E+04	5.66E+03	5.36E-02	7.99E-02	3.34E-02	1.52E-02	1.28E-01	2.54E-03	6.55E-01	.	
Lutetium (71)	Lu-172	3.78E+01	1.84E-02	4.65E-01	6.79E-01	2.35E-01	3.13E-02	4.61E-02	1.96E-02	9.38E-03	7.91E-02	1.57E-03	4.03E-01	.	
Lutetium (71)	Lu-172m	9.84E+04	7.04E-06	1.21E+03	1.77E+03	6.13E+02	3.13E-02	4.61E-02	1.96E-02	9.38E-03	7.91E-02	1.57E-03	4.03E-01	.	
Lutetium (71)	Lu-173	5.06E-01	1.37E+00	1.24E-01	1.83E-01	5.65E-02	1.81E-02	2.35E-02	1.13E-02	2.69E-02	2.28E-01	4.50E-03	1.16E+00	.	
Lutetium (71)	Lu-174	2.09E-01	3.31E+00	6.15E-02	9.10E-02	2.80E-02	1.52E-02	1.97E-02	9.47E-03	3.31E-02	2.81E-01	5.55E-03	1.43E+00	.	
Lutetium (71)	Lu-174m	1.78E+00	3.89E-01	4.11E-01	6.24E-01	1.60E-01	7.48E-03	9.66E-03	4.65E-03	1.02E-02	8.67E-02	1.71E-03	4.42E-01	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident Finfish PRG	Resident Tap Water PRG	Farmer Tap Water PRG	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )						
Lutetium (71)	Lu-176	1.80E-11	3.85E+10	2.35E-03	3.63E-03	6.79E-04	1.30E-03	1.67E-03	8.06E-04	5.50E-03	4.66E-02	9.20E-04	2.37E-01	.	
Lutetium (71)	Lu-176m	1.67E+03	4.15E-04	3.03E+13	4.58E+13	8.49E+13	5.05E-01	6.58E-01	3.14E-01	6.13E-02	5.20E-01	1.03E-02	2.65E+00	.	
Lutetium (71)	Lu-177	3.81E+01	1.82E-02	3.32E+01	5.41E+01	9.24E+00	4.95E-02	6.39E-02	3.08E-02	1.45E-02	1.23E-01	2.43E-03	6.29E-01	5.66E+01	
Lutetium (71)	Lu-177m	1.58E+00	4.39E-01	4.75E-02	6.99E-02	2.26E-02	3.95E-03	5.12E-03	2.45E-03	5.15E-03	4.36E-02	8.61E-04	2.22E-01	2.61E+02	
Lutetium (71)	Lu-178	1.28E+04	5.40E-05	1.08E+18	1.47E+18	5.50E+18	1.65E+00	3.81E+00	1.05E+00	6.42E-01	5.39E+00	1.07E-01	2.75E+01	.	
Lutetium (71)	Lu-178m	1.58E+04	4.39E-05	1.01E+19	1.38E+19	5.17E+19	3.27E-01	1.20E+00	2.12E-01	8.70E-01	7.27E+00	1.45E-01	3.71E+01	.	
Lutetium (71)	Lu-179	1.32E+03	5.24E-04	1.96E+12	2.76E+12	7.67E+12	4.16E-01	5.50E-01	2.59E-01	4.37E-02	3.70E-01	7.31E-03	1.89E+00	.	
Lutetium (71)	Lu-180	6.39E+04	1.08E-05	2.55E+21	3.46E+21	1.30E+22	2.23E-01	9.74E-01	1.45E-01	.	3.67E+03	2.34E+03	1.87E+04	.	
Lutetium (71)	Lu-181	1.04E+05	6.66E-06	5.29E+03	7.90E+03	2.00E+03	1.05E-02	1.38E-02	6.51E-03	8.08E-03	6.74E-02	6.89E-04	1.68E-01	1.85E+01	
Magnesium (12)	Mg-27	3.85E+04	1.80E-05	1.09E+20	1.47E+20	5.54E+20	3.82E-01	1.67E+00	2.48E-01	.	6.32E+03	4.02E+03	2.53E+01	.	
Magnesium (12)	Mg-28	2.90E+02	2.39E-03	1.95E+00	2.96E+00	1.01E+01	3.01E-02	4.89E-02	1.90E-02	4.57E-03	3.18E-02	2.22E-03	1.27E-04	.	
Manganese (25)	Mn-50m	2.08E+05	3.33E-06	4.65E+23	6.26E+23	2.37E+24	7.26E-02	3.17E-01	4.72E-02	.	1.20E+03	7.64E+02	1.44E+03	.	
Manganese (25)	Mn-51	7.88E+03	8.79E-05	6.74E+03	9.86E+03	3.45E+03	2.46E-01	6.37E-01	1.58E-01	1.34E-01	6.47E-01	6.08E-02	4.80E-04	4.44E-02	
Manganese (25)	Mn-52	4.52E+01	1.53E-02	2.63E-01	4.39E-01	1.41E-01	3.27E-02	5.52E-02	2.06E-02	8.31E-03	2.88E-02	3.33E-03	3.46E-02	4.00E+00	
Manganese (25)	Mn-52m	1.73E+04	4.01E-05	5.72E+03	9.55E+03	3.07E+03	1.26E-01	4.68E-01	8.17E-02	2.26E-01	7.82E-01	9.04E-02	9.38E-01	2.28E+02	
Manganese (25)	Mn-53	1.87E-07	3.70E+06	7.08E-02	8.54E+02	3.54E-02	2.39E-01	3.08E-01	1.49E-01	3.39E-01	1.18E+00	1.36E-01	1.41E+00	.	
Manganese (25)	Mn-54	8.10E-01	8.55E-01	1.91E-02	3.38E-02	1.04E-02	1.82E-02	2.42E-02	1.13E-02	2.43E-02	8.39E-02	9.72E-03	1.01E-01	1.33E+01	
Manganese (25)	Mn-56	2.35E+03	2.94E-04	8.43E+11	1.20E+12	4.36E+12	1.41E-01	3.74E-01	9.05E-02	5.07E-02	1.76E-01	2.04E-02	2.12E-01	1.33E+01	
Manganese (25)	Mn-57	2.56E+05	2.71E-06	1.65E+26	2.20E+26	8.38E+26	3.41E+00	1.49E+01	2.21E+00	.	5.69E+04	3.63E+04	6.83E+04	.	
Manganese (25)	Mn-58m	3.35E+05	2.07E-06	1.31E+25	1.75E+25	6.67E+25	1.38E-01	6.05E-01	9.00E-02	.	2.29E+03	1.46E+03	2.74E+03	.	
Molybdenum (42)	Mo-101	2.49E+04	2.78E-05	3.68E+17	9.95E+17	2.41E+18	1.78E-01	6.94E-01	1.15E-01	5.61E-01	8.31E-02	5.09E-02	1.70E-05	.	
Molybdenum (42)	Mo-102	3.22E+04	2.15E-05	3.39E+20	4.86E+20	1.75E+21	1.84E+00	4.33E+00	1.18E+00	5.27E-01	2.14E+00	1.27E+00	8.55E-02	.	
Molybdenum (42)	Mo-89	1.73E+05	4.01E-06	3.58E+03	5.22E+03	1.84E+03	4.61E-02	9.22E-02	2.93E-02	1.13E-02	9.39E-02	2.16E-02	4.63E-02	.	
Molybdenum (42)	Mo-90	1.09E+03	6.35E-04	5.69E+00	8.33E+00	4.44E+06	3.16E-02	6.18E-02	2.01E-02	8.33E-03	6.03E-02	6.44E-03	1.26E-02	.	
Molybdenum (42)	Mo-91	2.35E+04	2.95E-05	6.39E+06	1.72E+07	1.85E+06	4.05E-02	5.66E-02	2.53E-02	1.44E-01	9.24E-01	1.26E-01	9.11E-02	.	
Molybdenum (42)	Mo-91m	3.38E+05	2.05E-06	4.11E+05	9.00E+05	1.80E+05	1.70E-02	2.35E-02	1.06E-02	3.12E-02	2.41E-01	2.30E-02	1.27E-01	.	
Molybdenum (42)	Mo-93	1.73E-04	4.00E+03	5.35E-03	1.06E+01	2.41E-03	2.12E-02	2.73E-02	1.32E-02	1.52E-02	6.83E-02	2.41E-02	3.12E-03	6.31E+01	
Molybdenum (42)	Mo-93m	8.86E+02	7.82E-04	2.74E+04	5.44E+07	1.24E+04	1.78E-02	2.51E-02	1.11E-02	1.40E-02	6.22E-02	2.28E-02	2.80E-03	6.32E+01	
Molybdenum (42)	Mo-99	9.21E+01	7.53E-03	2.15E+00	1.49E+01	1.67E+00	5.33E-03	6.88E-03	3.31E-03	1.21E-02	8.65E-04	5.31E-04	1.74E-07	6.36E-03	
Nitrogen (7)	N-13	3.66E+04	1.90E-05	3.59E+19	4.87E+19	1.83E+20	3.48E-01	1.52E+00	2.26E-01	.	5.74E+03	3.66E+03	4.02E+00	.	
Nitrogen (7)	N-16	3.07E+06	2.26E-07	1.08E+31	1.44E+31	5.48E+31	6.05E-02	2.64E-01	3.93E-02	.	9.93E+02	6.32E+02	6.95E-01	.	
Sodium (11)	Na-22	2.66E-01	2.60E+00	2.66E-03	4.19E-03	4.41E-04	2.33E-03	3.03E-03	1.45E-03	5.97E-03	3.69E-02	9.20E-03	1.33E-04	5.33E-02	
Sodium (11)	Na-24	4.06E+02	1.71E-03	2.05E+00	3.00E+00	1.46E+06	5.37E-02	1.40E-01	3.45E-02	4.58E-02	2.84E-01	7.08E-02	1.02E-03	7.99E-02	
Niobium (41)	Nb-87	9.71E+04	7.13E-06	3.30E+03	4.96E+03	7.45E+02	5.02E-02	9.49E-02	3.19E-02	1.18E-02	9.08E-02	2.41E-02	1.15E-03	7.90E+02	
Niobium (41)	Nb-88	2.51E+04	2.76E-05	1.82E+02	2.67E+02	9.17E+01	5.92E-03	8.38E-03	3.70E-03	9.17E-03	7.45E-02	2.53E-02	4.67E-03	.	
Niobium (41)	Nb-88m	4.68E+04	1.48E-05	3.40E+02	4.97E+02	1.71E+02	5.93E-03	8.39E-03	3.71E-03	9.37E-03	7.62E-02	2.76E-02	4.68E-03	.	
Niobium (41)	Nb-89	2.99E+03	2.32E-04	6.20E+01	9.05E+01	3.18E+01	5.50E-02	9.96E-02	3.48E-02	1.13E-02	9.39E-02	2.16E-02	4.63E-02	.	
Niobium (41)	Nb-89m	5.52E+03	1.26E-04	1.22E+02	1.78E+02	6.25E+01	5.63E-02	1.10E-01	3.57E-02	1.39E-02	1.16E-01	3.53E-02	5.17E-02	.	
Niobium (41)	Nb-90	4.16E+02	1.67E-03	2.17E+00	3.17E+00	2.73E+06	4.26E-02	9.04E-02	2.72E-02	9.21E-03	7.27E-02	6.64E-03	1.09E-01	.	
Niobium (41)	Nb-91	1.02E-03	6.80E+02	3.27E-01	9.17E-01	8.93E-02	4.60E-02	5.93E-02	2.86E-02	1.92E-01	1.52E+00	1.39E-01	2.29E+00	.	
Niobium (41)	Nb-91m	4.16E+00	1.67E-01	2.53E+00	5.53E+00	1.11E+00	1.18E-02	1.53E-02	7.36E-03	1.75E-02	1.39E-01	1.26E-02	2.08E-01	.	
Niobium (41)	Nb-92	2.00E-08	3.47E+07	6.14E-04	9.39E-04	2.04E-04	3.05E-03	3.96E-03	1.90E-03	1.64E-02	1.29E-01	1.18E-02	1.93E-01	.	
Niobium (41)	Nb-92m	2.49E+01	2.78E-02	6.04E-01	8.87E-01	3.10E-01	1.11E-01	1.83E-01	6.99E-02	3.17E-02	2.50E-01	2.29E-02	3.74E-01	.	
Niobium (41)	Nb-93m	4.30E-02	1.61E+01	3.73E-01	1.39E+02	1.05E-01	3.81E-02	4.91E-02	2.37E-02	6.19E-02	4.91E-01	4.47E-02	7.36E-01	5.55E+01	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)										Protection of Groundwater (DAF = 1)	
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Niobium (41)	Nb-94	3.41E-05	2.03E+04	5.80E-04	8.99E-04	1.92E-04	1.70E-03	2.20E-03	1.06E-03	6.78E-03	5.35E-02	4.89E-03	8.03E-02	.	
Niobium (41)	Nb-94m	5.82E+04	1.19E-05	9.93E+05	1.54E+06	3.28E+05	1.71E-03	2.22E-03	1.06E-03	6.82E-03	5.38E-02	4.92E-03	8.07E-02	.	
Niobium (41)	Nb-95	7.23E+00	9.59E-02	2.25E-01	3.32E-01	1.15E-01	3.33E-02	4.52E-02	2.07E-02	2.15E-02	1.70E-01	1.55E-02	2.55E-01	1.67E+01	
Niobium (41)	Nb-95m	7.01E+01	9.89E-03	2.10E+00	3.18E+00	1.06E+00	2.23E-02	2.98E-02	1.39E-02	8.30E-03	6.57E-02	5.99E-03	9.86E-02	1.76E+01	
Niobium (41)	Nb-96	2.60E+02	2.67E-03	2.50E+00	3.68E+00	1.28E+00	5.65E-02	1.02E-01	3.57E-02	1.04E-02	8.21E-02	7.49E-03	1.23E-01	.	
Niobium (41)	Nb-97	5.05E+03	1.37E-04	1.29E+15	1.75E+15	6.54E+15	4.17E-01	1.22E+00	2.68E-01	2.70E-01	2.13E+00	1.94E-01	3.19E+00	1.67E+02	
Niobium (41)	Nb-98m	7.10E+03	9.76E-05	3.78E+14	5.14E+14	1.93E+15	1.13E-01	4.29E-01	7.30E-02	2.01E-01	1.58E+00	1.45E-01	2.38E+00	.	
Niobium (41)	Nb-99	1.46E+06	4.76E-07	3.40E+04	2.35E+05	2.64E+04	5.31E-03	6.88E-03	3.30E-03	1.21E-02	8.65E-04	5.31E-04	1.74E-07	6.36E-03	
Niobium (41)	Nb-99m	1.40E+05	4.95E-06	3.27E+03	2.26E+04	2.54E+03	5.26E-03	6.85E-03	3.27E-03	1.21E-02	8.65E-04	5.31E-04	1.74E-07	6.36E-03	
Neodymium (60)	Nd-134	4.29E+04	1.62E-05	1.44E+03	2.19E+03	5.89E+02	2.22E-02	3.40E-02	1.39E-02	3.04E-03	2.54E-02	1.22E-03	3.02E-02	.	
Neodymium (60)	Nd-135	2.94E+04	2.36E-05	9.24E+02	1.35E+03	3.12E+04	9.29E-02	2.60E-01	5.97E-02	3.86E-02	3.20E-01	1.76E-02	3.69E-01	.	
Neodymium (60)	Nd-136	7.19E+03	9.64E-05	3.96E+14	5.38E+14	2.02E+15	1.31E-01	4.73E-01	8.48E-02	1.63E-01	1.35E+00	2.75E-01	8.77E-01	.	
Neodymium (60)	Nd-137	9.46E+03	7.32E-05	3.52E+08	7.61E+08	9.64E+07	1.49E-02	2.02E-02	9.31E-03	6.96E-02	5.78E-01	4.18E-02	7.42E-01	.	
Neodymium (60)	Nd-138	1.20E+03	5.75E-04	4.53E+10	6.19E+10	2.27E+11	1.28E-01	2.10E-01	8.07E-02	1.51E-02	1.27E-01	2.56E-02	8.24E-02	.	
Neodymium (60)	Nd-139	1.23E+04	5.65E-05	2.94E+03	4.38E+03	1.32E+03	3.08E-02	4.14E-02	1.92E-02	3.33E-02	2.78E-01	1.47E-02	3.00E-01	.	
Neodymium (60)	Nd-139m	1.10E+03	6.28E-04	2.65E+02	3.95E+02	1.19E+02	2.64E-02	3.78E-02	1.65E-02	2.07E-02	1.73E-01	1.27E-02	1.50E-01	.	
Neodymium (60)	Nd-140	7.51E+01	9.23E-03	3.43E+00	5.16E+00	1.62E+00	3.60E-02	4.82E-02	2.24E-02	4.14E-03	3.49E-02	7.04E-03	2.27E-02	.	
Neodymium (60)	Nd-141	2.44E+03	2.84E-04	8.53E+13	1.16E+14	4.34E+14	4.52E+00	1.20E+01	2.90E+00	1.67E+00	1.40E+01	2.83E+00	9.08E+00	.	
Neodymium (60)	Nd-141m	3.52E+05	1.97E-06	1.23E+16	1.66E+16	6.23E+16	4.51E-01	1.85E+00	2.92E-01	1.67E+00	1.40E+01	2.83E+00	9.07E+00	.	
Neodymium (60)	Nd-144	3.03E-16	2.29E+15	2.64E-02	2.14E+00	2.28E-03	2.21E-05	2.85E-05	1.37E-05	1.92E-03	1.56E-02	3.23E-03	1.02E-02	3.61E-01	
Neodymium (60)	Nd-147	2.30E+01	3.01E-02	4.26E+00	7.64E+00	1.86E+00	1.82E-05	2.34E-05	1.13E-05	1.25E-03	1.02E-02	1.81E-04	8.50E-03	4.45E-01	
Neodymium (60)	Nd-149	3.51E+03	1.97E-04	1.18E+03	1.11E+04	7.35E+02	5.46E-02	7.33E-02	3.40E-02	7.16E-03	5.38E-02	2.00E-02	2.47E-02	1.55E+00	
Neodymium (60)	Nd-151	2.93E+04	2.37E-05	2.16E+03	3.60E+03	1.12E+03	1.85E-02	2.49E-02	1.15E-02	1.01E-02	7.62E-02	8.15E-03	3.63E-02	3.44E+01	
Neodymium (60)	Nd-152	3.20E+04	2.17E-05	1.06E+20	1.43E+20	5.38E+20	6.70E-01	2.27E+00	4.33E-01	7.14E-01	5.92E+00	1.21E+00	3.85E+00	.	
Neon (10)	Ne-19	1.27E+06	5.46E-07	6.03E+29	8.06E+29	3.07E+30	3.47E-01	1.52E+00	2.26E-01	.	5.71E+03	3.64E+03	.	.	
Neon (10)	Ne-24	1.08E+05	6.43E-06	2.22E+06	2.01E+06	3.86E+08	4.96E-02	1.34E-01	3.19E-02	4.58E-02	2.84E-01	7.08E-02	1.02E-03	7.99E-02	
Nickel (28)	Ni-56	4.16E+01	1.66E-02	1.69E-01	2.59E-01	8.78E-02	6.94E-03	9.71E-03	4.34E-03	4.14E-03	2.54E-02	6.79E-03	1.09E-02	.	
Nickel (28)	Ni-57	1.71E+02	4.06E-03	1.89E+00	2.81E+00	9.73E-01	3.20E-02	4.78E-02	2.01E-02	1.03E-02	7.56E-02	2.74E-02	2.37E-02	1.78E+01	
Nickel (28)	Ni-59	6.86E-06	1.01E+05	7.15E-01	7.77E+01	1.96E-01	9.63E-02	1.24E-01	5.99E-02	1.96E-01	1.54E+00	6.66E-01	4.32E-01	3.11E+00	
Nickel (28)	Ni-63	6.92E-03	1.00E+02	3.14E-01	1.81E+02	9.01E-02	3.91E-02	5.03E-02	2.43E-02	7.77E-02	6.13E-01	2.65E-01	1.72E-01	5.18E-01	
Nickel (28)	Ni-65	2.41E+03	2.87E-04	4.74E+12	6.47E+12	2.41E+13	2.09E-01	3.60E-01	1.32E-01	7.51E-02	5.95E-01	2.56E-01	1.67E-01	3.11E+00	
Nickel (28)	Ni-66	1.11E+02	6.23E-03	1.30E+01	3.63E+01	6.07E+00	2.29E-02	2.97E-02	1.43E-02	2.55E-03	2.03E-02	8.73E-03	5.68E-03	.	
Neptunium (93)	Np-232	2.48E+04	2.80E-05	5.99E+02	2.55E+03	2.10E-01	9.70E-07	1.25E-06	6.03E-07	9.32E-05	5.56E-04	2.58E-05	6.83E-07	6.22E-04	
Neptunium (93)	Np-233	1.01E+04	6.89E-05	1.31E+06	1.46E+07	3.92E+02	8.92E-07	1.15E-06	5.54E-07	9.25E-05	7.45E-04	1.60E-05	1.89E-06	3.49E-03	
Neptunium (93)	Np-234	5.75E+01	1.21E-02	1.18E+00	1.73E+00	1.80E-04	1.90E-06	2.45E-06	1.18E-06	1.80E-05	1.35E-04	1.96E-05	8.75E-07	2.16E-04	
Neptunium (93)	Np-235	6.39E-01	1.09E+00	7.49E+00	7.24E+01	1.43E-05	7.31E-07	9.41E-07	4.54E-07	7.70E-05	5.69E-04	4.66E-05	1.27E-06	4.52E-04	
Neptunium (93)	Np-236	4.50E-06	1.54E+05	1.29E-03	4.88E-03	1.54E-08	8.78E-07	1.13E-06	5.46E-07	3.88E-05	2.57E-04	9.72E-06	3.64E-07	1.76E-04	
Neptunium (93)	Np-236m	2.70E+02	2.57E-03	1.40E+03	5.99E+01	4.72E-04	8.78E-07	1.13E-06	5.46E-07	4.97E-05	3.23E-04	7.34E-06	4.55E-07	2.39E-04	
Neptunium (93)	Np-237	3.23E-07	2.14E+06	4.79E-04	3.87E-03	3.70E-09	8.02E-07	1.03E-06	4.99E-07	8.32E-05	6.67E-04	8.58E-06	1.13E-06	2.09E-04	
Neptunium (93)	Np-238	1.19E+02	5.80E-03	4.53E+00	6.96E+00	1.21E-04	1.33E-06	1.71E-06	8.25E-07	1.73E-05	1.30E-04	3.07E-06	8.26E-07	2.01E-04	
Neptunium (93)	Np-239	1.07E+02	6.46E-03	1.75E+01	3.06E+01	1.73E-04	6.21E-07	8.00E-07	3.86E-07	6.50E-05	4.88E-04	3.27E-06	1.15E-06	3.59E-04	
Neptunium (93)	Np-240	5.88E+03	1.18E-04	9.19E+05	2.55E+07	1.00E+00	7.35E-07	9.47E-07	4.57E-07	3.35E-05	2.26E-04	2.81E-06	3.46E-07	1.52E-04	
Neptunium (93)	Np-240m	5.04E+04	1.37E-05	7.88E+06	2.18E+08	8.58E+00	7.35E-07	9.47E-07	4.57E-07	3.35E-05	2.26E-04	2.82E-06	3.46E-07	1.52E-04	
Neptunium (93)	Np-241	2.62E+04	2.64E-05	3.15E+05	3.10E+06	1.26E+00	7.07E-07	9.11E-07	4.40E-07	7.23E-05	5.82E-04	6.93E-06	1.07E-06	1.91E-04	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident Soil Total PRG TR=1E-06 (Bq/g)	Composite Worker Soil Total PRG TR=1E-06 (Bq/g)	Farmer Soil Total PRG TR=1E-06 (Bq/g)	Resident Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Composite Worker Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Farmer Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Resident Finfish PRG TR=1E-06 (Bq/g)	Resident Tap Water PRG TR=1E-06 (Bq/L)	Farmer Tap Water Total PRG TR=1E-06 (Bq/L)	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
Neptunium (93)	Np-242	1.66E+05	4.19E-06	1.55E+09	4.18E+10	1.69E+03	1.17E-06	1.50E-06	7.24E-07	1.69E-05	1.27E-04	3.10E-06	7.04E-07	1.06E-04	
Neptunium (93)	Np-242m	6.62E+04	1.05E-05	6.19E+08	1.67E+10	6.75E+02	1.17E-06	1.50E-06	7.24E-07	1.69E-05	1.27E-04	3.10E-06	7.04E-07	1.06E-04	
Oxygen (8)	O-14	3.10E+05	2.24E-06	1.77E+25	2.37E+25	9.02E+25	9.63E-02	4.21E-01	6.26E-02	.	1.60E+03	1.02E+03	.	.	
Oxygen (8)	O-15	1.79E+05	3.88E-06	5.95E+23	7.97E+23	3.03E+24	3.47E-01	1.52E+00	2.26E-01	.	5.73E+03	3.65E+03	.	.	
Oxygen (8)	O-19	8.26E+05	8.39E-07	1.23E+28	1.64E+28	6.27E+28	3.51E-01	1.53E+00	2.28E-01	.	5.80E+03	3.69E+03	.	.	
Osmium (76)	Os-180	1.69E+04	4.09E-05	2.09E+17	2.83E+17	1.06E+18	2.60E-01	1.06E+00	1.69E-01	1.43E+00	9.85E+00	5.99E+00	3.97E+00	.	
Osmium (76)	Os-181	3.47E+03	2.00E-04	8.28E+01	1.67E+02	4.21E+01	6.40E-02	1.15E-01	4.05E-02	2.37E-02	6.27E-02	1.49E-02	9.34E-04	5.56E+00	
Osmium (76)	Os-182	2.75E+02	2.52E-03	3.96E+00	6.18E+00	2.08E+00	7.21E-02	1.22E-01	4.55E-02	1.47E-02	8.09E-02	4.89E-02	1.50E-03	.	
Osmium (76)	Os-183	4.67E+02	1.48E-03	1.26E+01	2.77E+01	1.97E+01	1.70E-02	2.24E-02	1.06E-02	1.21E-02	4.68E-02	2.81E-02	4.15E-04	.	
Osmium (76)	Os-183m	6.13E+02	1.13E-03	3.32E+01	1.40E+02	2.59E+01	1.67E-02	2.24E-02	1.04E-02	1.23E-02	4.72E-02	2.83E-02	4.15E-04	.	
Osmium (76)	Os-185	2.70E+00	2.56E-01	9.73E-01	1.47E-01	5.08E-02	3.61E-02	4.89E-02	2.25E-02	2.87E-02	1.99E-01	1.21E-01	8.95E-02	3.33E+00	
Osmium (76)	Os-186	3.47E-16	2.00E+15	9.42E-04	1.05E+00	5.27E-04	1.92E-05	2.47E-05	1.19E-05	7.19E-04	4.92E-03	2.99E-03	2.22E-03	.	
Osmium (76)	Os-189m	1.05E+03	6.62E-04	9.35E+12	1.57E+16	7.96E+13	6.96E+00	8.96E+00	4.32E+00	5.20E-01	3.63E+00	2.21E+00	1.63E+00	.	
Osmium (76)	Os-190m	3.68E+04	1.88E-05	2.32E+19	3.15E+19	1.18E+20	2.26E-01	9.86E-01	1.47E-01	.	3.70E+03	2.36E+03	1.66E+03	.	
Osmium (76)	Os-191	1.64E+01	4.22E-02	4.42E+00	1.50E+01	2.95E+00	3.07E-02	3.97E-02	1.91E-02	1.38E-02	9.65E-02	5.87E-02	4.35E-02	9.99E+00	
Osmium (76)	Os-191m	4.63E+02	1.50E-03	1.12E+02	4.04E+02	8.33E+01	2.82E-02	3.65E-02	1.75E-02	1.18E-02	8.25E-02	5.02E-02	3.72E-02	9.37E+00	
Osmium (76)	Os-193	2.02E+02	3.44E-03	3.80E+01	1.33E+02	2.54E+01	8.07E-02	1.05E-01	5.02E-02	9.50E-03	6.62E-02	4.02E-02	2.53E-02	3.33E+00	
Osmium (76)	Os-194	1.16E-01	6.00E+00	6.93E-03	4.78E-02	1.49E-03	8.86E-04	1.14E-03	5.50E-04	2.13E-03	1.48E-02	8.50E-03	1.31E-04	1.07E-02	
Osmium (76)	Os-196	1.04E+04	6.64E-05	6.60E+16	9.04E+16	3.38E+17	6.91E-01	1.59E+00	4.41E-01	2.48E-01	1.71E+00	1.04E+00	7.63E-01	.	
Phosphorus (15)	P-30	1.46E+05	4.75E-06	1.69E+23	2.28E+23	8.61E+23	3.44E-01	1.50E+00	2.24E-01	.	5.68E+03	3.62E+03	5.13E+02	.	
Phosphorus (15)	P-32	1.77E+01	3.91E-02	1.19E-01	3.17E+02	7.06E-04	1.65E-02	2.13E-02	1.03E-02	6.13E-03	6.36E-03	1.11E-05	5.74E-04	1.00E-01	
Phosphorus (15)	P-33	9.98E+00	6.94E-02	6.08E-01	1.70E+04	3.59E-03	3.76E-02	4.85E-02	2.34E-02	5.54E-02	5.75E-02	1.00E-04	5.19E-03	.	
Protactinium (91)	Pa-227	9.51E+03	7.29E-05	5.43E+02	6.23E+03	8.21E-01	2.33E-05	3.01E-05	1.45E-05	1.20E-03	5.33E-03	3.62E-04	1.27E-05	4.34E-03	
Protactinium (91)	Pa-228	2.76E+02	2.51E-03	1.35E+00	3.30E+00	3.53E-03	1.62E-06	2.08E-06	1.01E-06	1.77E-04	8.64E-04	3.08E-05	2.57E-06	6.23E-04	
Protactinium (91)	Pa-229	1.69E+02	4.11E-03	1.03E+02	1.80E+02	4.50E-01	1.01E-06	1.30E-06	6.25E-07	1.05E-04	8.48E-04	1.65E-05	3.86E-06	3.50E-03	
Protactinium (91)	Pa-230	1.45E+01	4.77E-02	3.18E-01	7.96E-01	7.86E-04	2.42E-06	3.12E-06	1.51E-06	1.86E-05	1.39E-04	2.23E-05	1.16E-06	2.36E-04	
Protactinium (91)	Pa-231	2.12E-05	3.28E+04	2.49E-04	3.59E-03	3.26E-07	7.94E-07	1.02E-06	4.94E-07	8.56E-05	6.27E-04	5.24E-05	1.91E-06	6.60E-04	
Protactinium (91)	Pa-232	1.93E+02	3.59E-03	2.45E+00	5.43E+00	1.64E-03	9.70E-07	1.25E-06	6.03E-07	9.26E-05	5.54E-04	2.58E-05	6.83E-07	6.22E-04	
Protactinium (91)	Pa-233	9.38E+00	7.39E-02	1.11E+00	1.89E+00	3.38E-01	8.92E-07	1.15E-06	5.54E-07	9.15E-05	7.37E-04	1.60E-05	1.89E-06	3.49E-03	
Protactinium (91)	Pa-234	9.06E+02	7.65E-04	3.56E+04	4.06E+05	6.84E+01	1.90E-06	2.45E-06	1.18E-06	1.80E-05	1.35E-04	2.07E-05	8.88E-07	2.16E-04	
Protactinium (91)	Pa-234m	3.11E+05	2.23E-06	1.22E+07	1.40E+08	2.35E+04	1.90E-06	2.45E-06	1.18E-06	1.80E-05	1.35E-04	2.07E-05	8.88E-07	2.16E-04	
Protactinium (91)	Pa-235	1.49E+04	4.66E-05	3.43E+09	4.09E+10	2.57E+06	7.31E-07	9.41E-07	4.54E-07	7.70E-05	5.69E-04	4.74E-05	1.27E-06	4.52E-04	
Protactinium (91)	Pa-236	4.00E+04	1.73E-05	5.79E+09	4.63E+11	5.15E+05	8.94E-07	1.15E-06	5.55E-07	3.63E-05	2.41E-04	1.32E-05	3.52E-07	1.61E-04	
Protactinium (91)	Pa-237	4.19E+04	1.66E-05	1.03E+04	1.82E+04	7.73E+00	8.02E-07	1.03E-06	4.99E-07	8.25E-05	6.62E-04	8.57E-06	1.11E-06	2.09E-04	
Lead (82)	Pb-194	3.04E+04	2.28E-05	1.30E+04	2.66E+04	4.60E+03	2.98E-03	3.91E-03	1.85E-03	1.17E-02	4.12E-02	5.65E-04	2.43E-01	.	
Lead (82)	Pb-195m	2.43E+04	2.85E-05	2.24E+03	4.59E+03	8.68E+03	1.66E-02	2.39E-02	1.04E-02	2.35E-02	1.27E-01	1.80E-03	5.87E-01	.	
Lead (82)	Pb-196	9.84E+03	7.04E-05	1.68E+13	2.28E+13	8.54E+13	1.35E-01	5.08E-01	8.76E-02	2.95E-01	2.36E+00	1.19E-01	7.60E-01	.	
Lead (82)	Pb-197	4.55E+04	1.52E-05	4.77E+03	6.07E+04	2.93E+03	1.35E-02	1.84E-02	8.41E-03	3.25E-02	8.74E-02	1.18E-03	5.29E-01	2.10E+02	
Lead (82)	Pb-197m	8.47E+03	8.18E-05	8.87E+02	1.13E+04	5.45E+02	1.35E-02	1.83E-02	8.40E-03	3.05E-02	8.53E-02	1.18E-03	2.70E-01	2.10E+02	
Lead (82)	Pb-198	2.53E+03	2.74E-04	8.46E+09	1.15E+10	4.30E+10	1.19E-01	3.87E-01	7.69E-02	1.18E-01	9.24E-01	6.31E-02	2.19E-01	.	
Lead (82)	Pb-199	4.05E+03	1.71E-04	6.54E+10	3.63E+10	4.19E+11	2.20E-01	6.63E-01	1.42E-01	2.78E-01	2.18E+00	1.63E-01	4.83E-01	.	
Lead (82)	Pb-200	2.82E+02	2.45E-03	4.77E+00	7.01E+00	2.42E+00	8.55E-02	1.49E-01	5.40E-02	2.44E-02	1.89E-01	1.85E-02	3.66E-02	5.55E+01	
Lead (82)	Pb-201	6.51E+02	1.07E-03	3.83E+02	5.61E+02	1.66E+02	1.42E-01	2.38E-01	8.97E-02	5.54E-02	4.34E-01	3.30E-02	9.54E-02	5.00E+01	
Lead (82)	Pb-201m	3.58E+05	1.93E-06	2.11E+05	3.09E+05	9.12E+04	1.24E-01	2.25E-01	7.86E-02	5.54E-02	4.34E-01	3.30E-02	9.54E-02	5.00E+01	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Lead (82)	Pb-202	1.32E-05	5.25E+04	1.46E-03	3.57E-03	3.75E-04	1.65E-03	2.12E-03	1.02E-03	1.60E-03	1.19E-02	2.79E-03	1.86E-03	1.68E+01	
Lead (82)	Pb-202m	1.72E+03	4.03E-04	1.09E+03	1.60E+03	5.19E+02	1.79E-03	2.33E-03	1.12E-03	1.73E-03	1.29E-02	2.96E-03	2.02E-03	1.68E+01	
Lead (82)	Pb-203	1.17E+02	5.92E-03	1.15E+01	1.73E+01	5.80E+00	2.22E-01	3.28E-01	1.39E-01	5.07E-02	3.83E-01	1.18E-01	5.75E-02	5.56E+00	
Lead (82)	Pb-204m	5.42E+03	1.28E-04	1.12E+14	1.52E+14	5.70E+14	1.61E-01	6.44E-01	1.04E-01	4.28E-01	3.20E+00	9.93E-01	4.81E-01	.	
Lead (82)	Pb-205	4.53E-08	1.53E+07	2.16E-01	1.16E+02	4.32E-02	1.01E-01	1.30E-01	6.27E-02	9.38E-02	6.94E-01	2.16E-01	1.04E-01	.	
Lead (82)	Pb-209	1.87E+03	3.71E-04	1.90E+14	4.73E+15	5.93E+14	1.10E+00	1.42E+00	6.86E-01	2.16E-01	1.64E+00	5.04E-01	2.46E-01	.	
Lead (82)	Pb-210	3.12E-02	2.22E+01	1.63E-04	4.14E-02	1.75E-05	7.45E-06	9.60E-06	4.63E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	8.11E-02	
Lead (82)	Pb-211	1.01E+04	6.87E-05	4.91E+17	6.85E+17	2.46E+18	5.69E-03	7.34E-03	3.54E-03	1.30E-01	9.76E-01	3.02E-01	1.47E-01	2.67E-01	
Lead (82)	Pb-212	5.71E+02	1.21E-03	3.24E+06	9.30E+01	4.18E+08	3.09E-04	3.99E-04	1.92E-04	2.05E-03	1.52E-02	4.79E-03	2.36E-03	1.08E-01	
Lead (82)	Pb-214	1.36E+04	5.10E-05	7.10E+01	1.80E+04	7.60E+00	7.42E-06	9.56E-06	4.61E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	4.06E-02	
Palladium (46)	Pd-100	6.97E+01	9.95E-03	5.25E-01	8.15E-01	2.65E-01	3.94E-02	6.68E-02	2.49E-02	8.50E-03	4.67E-02	2.51E-02	6.08E-04	.	
Palladium (46)	Pd-101	7.17E+02	9.67E-04	6.45E+01	9.91E+01	2.75E+01	9.45E-02	1.38E-01	5.92E-02	3.61E-02	2.23E-01	1.18E-01	1.45E-03	.	
Palladium (46)	Pd-103	1.49E+01	4.66E-02	6.36E+00	1.89E+03	5.48E+00	1.29E-01	1.67E-01	8.05E-02	4.09E-02	2.00E-01	1.09E-01	2.97E-02	2.63E+00	
Palladium (46)	Pd-107	1.07E-07	6.50E+06	7.94E-02	5.62E+02	4.53E-02	1.31E-01	1.69E-01	8.15E-02	1.98E-01	9.63E-01	5.26E-01	1.74E-01	.	
Palladium (46)	Pd-109	4.43E+02	1.56E-03	6.57E+01	5.57E+03	5.00E+08	1.21E-01	1.56E-01	7.54E-02	1.44E-02	7.03E-02	3.84E-02	1.27E-02	2.00E+00	
Palladium (46)	Pd-109m	7.77E+04	8.92E-06	1.35E+08	6.48E+09	8.71E+10	1.17E-01	1.55E-01	7.30E-02	1.44E-02	7.03E-02	3.84E-02	1.27E-02	2.00E+00	
Palladium (46)	Pd-111	1.56E+04	4.45E-05	7.47E+02	2.30E+04	5.73E+01	3.08E-02	3.98E-02	1.91E-02	6.23E-03	2.69E-02	2.98E-03	1.01E-02	1.42E+00	
Palladium (46)	Pd-112	2.89E+02	2.40E-03	4.29E+00	1.38E+01	1.80E+00	2.85E-02	3.83E-02	1.78E-02	2.68E-03	1.29E-02	4.86E-03	2.47E-03	.	
Palladium (46)	Pd-114	1.51E+05	4.60E-06	8.99E+23	1.21E+24	4.58E+24	1.09E+00	4.76E+00	7.09E-01	.	1.82E+04	1.16E+04	6.36E+03	.	
Palladium (46)	Pd-96	1.79E+05	3.87E-06	4.68E+19	6.35E+19	2.38E+20	6.75E-02	2.95E-01	4.39E-02	.	1.12E+03	7.11E+02	6.43E+00	.	
Palladium (46)	Pd-97	1.17E+05	5.90E-06	1.39E+04	2.18E+04	6.92E+03	2.82E-02	4.76E-02	1.78E-02	5.24E-02	8.90E-03	5.38E-03	1.81E-06	4.41E-02	
Palladium (46)	Pd-98	2.06E+04	3.37E-05	4.44E+17	6.04E+17	2.27E+18	1.52E-01	6.10E-01	9.85E-02	4.65E-01	2.25E+00	1.23E+00	3.93E-01	.	
Palladium (46)	Pd-99	1.70E+04	4.07E-05	2.28E+04	3.56E+04	9.30E+03	1.47E-01	4.43E-01	9.47E-02	1.32E-01	8.49E-01	4.46E-01	4.69E-03	.	
Promethium (61)	Pm-136	2.04E+05	3.39E-06	1.09E+16	1.47E+16	5.53E+16	6.48E-02	2.56E-01	4.20E-02	1.63E-01	1.35E+00	2.75E-01	8.76E-01	.	
Promethium (61)	Pm-137m	1.52E+05	4.57E-06	5.65E+09	1.22E+10	1.55E+09	1.39E-02	1.97E-02	8.68E-03	6.96E-02	5.78E-01	4.18E-02	7.41E-01	.	
Promethium (61)	Pm-139	8.78E+04	7.90E-06	2.10E+04	3.14E+04	9.44E+03	2.85E-02	4.04E-02	1.78E-02	3.33E-02	2.78E-01	1.47E-02	3.00E-01	.	
Promethium (61)	Pm-140	2.38E+06	2.92E-07	1.09E+05	1.63E+05	5.13E+04	3.24E-02	4.67E-02	2.03E-02	4.14E-03	3.49E-02	7.04E-03	2.27E-02	.	
Promethium (61)	Pm-140m	6.12E+04	1.13E-05	2.80E+03	4.20E+03	1.32E+03	2.74E-02	4.40E-02	1.72E-02	4.14E-03	3.49E-02	7.04E-03	2.27E-02	.	
Promethium (61)	Pm-141	1.74E+04	3.98E-05	5.24E+14	7.12E+14	2.66E+15	4.10E-01	1.52E+00	2.66E-01	5.59E-01	4.29E+00	1.32E+00	2.13E+00	.	
Promethium (61)	Pm-142	5.40E+05	1.28E-06	6.62E+26	8.86E+26	3.38E+27	4.09E-01	1.79E+00	2.66E-01	.	6.76E+03	4.30E+03	3.04E+03	.	
Promethium (61)	Pm-143	9.55E-01	7.26E-01	7.78E-02	1.16E-01	4.02E-02	2.48E-02	3.24E-02	1.54E-02	6.07E-02	4.49E-01	1.78E-01	2.02E-01	.	
Promethium (61)	Pm-144	6.97E-01	9.95E-01	1.10E-02	1.64E-02	5.70E-03	2.20E-05	2.83E-05	1.37E-05	1.71E-03	1.38E-02	3.02E-03	8.54E-03	3.61E-01	
Promethium (61)	Pm-145	3.92E-02	1.77E+01	1.81E-01	6.44E-01	8.56E-02	1.85E-02	2.38E-02	1.15E-02	9.93E-02	7.37E-01	2.92E-01	3.32E-01	.	
Promethium (61)	Pm-146	1.25E-01	5.53E+00	4.22E-03	6.49E-03	2.12E-03	4.78E-05	6.16E-05	2.97E-05	3.19E-03	2.55E-02	4.90E-04	1.84E-02	.	
Promethium (61)	Pm-147	2.64E-01	2.62E+00	4.12E-01	3.96E+02	2.67E-01	1.82E-05	2.34E-05	1.13E-05	1.50E-03	1.23E-02	1.84E-04	1.08E-02	4.91E-01	
Promethium (61)	Pm-148	4.71E+01	1.47E-02	1.49E+00	2.72E+00	7.98E-01	1.08E-05	1.39E-05	6.72E-06	7.13E-04	5.70E-03	1.96E-04	3.70E-03	2.12E-01	
Promethium (61)	Pm-148m	6.13E+00	1.13E-01	7.24E-02	1.10E-01	3.75E-02	1.08E-05	1.39E-05	6.72E-06	8.11E-04	6.55E-03	1.99E-04	4.56E-03	2.12E-01	
Promethium (61)	Pm-149	1.14E+02	6.06E-03	3.84E+01	3.61E+02	2.39E+01	6.28E-02	8.10E-02	3.90E-02	7.74E-03	5.76E-02	2.28E-02	2.59E-02	1.67E+00	
Promethium (61)	Pm-150	2.27E+03	3.06E-04	6.26E+11	8.55E+11	3.19E+12	1.56E-01	3.91E-01	1.00E-01	4.79E-02	3.55E-01	1.41E-01	1.60E-01	.	
Promethium (61)	Pm-151	2.14E+02	3.24E-03	1.59E+01	2.65E+01	8.19E+00	1.95E-02	2.54E-02	1.21E-02	1.02E-02	7.71E-02	8.20E-03	3.66E-02	3.44E+01	
Promethium (61)	Pm-152	8.84E+04	7.84E-06	2.23E+22	3.03E+22	1.14E+23	1.16E+00	5.05E+00	7.51E-01	.	1.91E+04	1.22E+04	8.60E+03	.	
Promethium (61)	Pm-152m	4.84E+04	1.43E-05	2.62E+20	3.55E+20	1.33E+21	2.25E-01	9.83E-01	1.46E-01	.	3.70E+03	2.36E+03	1.66E+03	.	
Promethium (61)	Pm-153	6.94E+04	9.99E-06	5.94E+20	1.01E+05	2.99E+03	7.06E-02	9.23E-02	4.39E-02	1.07E-02	9.10E-02	1.25E-03	8.46E-02	6.88E+00	
Promethium (61)	Pm-154	2.11E+05	3.29E-06	1.02E+24	1.37E+24	5.19E+24	1.80E-01	7.87E-01	1.17E-01	.	2.99E+03	1.91E+03	1.35E+03	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)										Protection of Groundwater (DAF = 1)	
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Promethium (61)	Pm-154m	1.36E+05	5.10E-06	5.69E+22	7.67E+22	2.90E+23	1.86E-01	8.14E-01	1.21E-01		3.07E+03	1.96E+03	1.38E+03		
Polonium (84)	Po-203	9.92E+03	6.98E-05	9.77E+02	1.47E+03	4.92E+02	4.83E-02	1.10E-01	3.09E-02	1.71E-02	9.60E-02	4.18E-02	2.90E-02	5.56E+00	
Polonium (84)	Po-204	1.72E+03	4.03E-04	4.39E+03	2.07E+01	2.49E+03	4.45E-02	9.33E-02	2.83E-02	1.77E-02	9.84E-02	4.56E-02	3.75E-02	8.41E+03	
Polonium (84)	Po-205	3.66E+03	1.89E-04	4.59E+01	7.23E+01	2.43E+01	2.76E-02	4.39E-02	1.74E-02	1.31E-02	6.78E-02	3.24E-02	2.61E-02	1.25E+05	
Polonium (84)	Po-206	2.87E+01	2.41E-02	1.51E-01	2.38E-01	7.38E-02	9.74E-04	1.27E-03	6.06E-04	1.36E-03	9.87E-03	3.69E-03	2.42E-03	1.87E+00	
Polonium (84)	Po-207	1.05E+03	6.62E-04	3.36E+01	5.87E+01	1.34E+01	2.05E-03	2.67E-03	1.28E-03	8.57E-03	4.28E-02	2.16E-02	1.96E-02	3.55E+00	
Polonium (84)	Po-208	2.39E-01	2.90E+00	2.86E-03	1.97E-01	1.16E-04	1.02E-05	1.31E-05	6.33E-06	2.68E-05	2.19E-04	7.63E-05	4.60E-05	1.17E-01	
Polonium (84)	Po-209	6.79E-03	1.02E+02	5.03E-04	3.17E-02	1.40E-05	8.15E-06	1.05E-05	5.07E-06	2.70E-05	2.20E-04	7.68E-05	4.63E-05		
Polonium (84)	Po-210	1.83E+00	3.79E-01	2.72E-02	1.88E+00	1.11E-03	1.58E-05	2.04E-05	9.85E-06	3.34E-05	2.73E-04	9.52E-05	5.74E-05	1.17E-01	
Polonium (84)	Po-211	4.24E+07	1.64E-08	3.94E+40	5.27E+40	2.01E+41	4.24E+01	1.85E+02	2.75E+01		7.00E+05	4.46E+05	1.47E+05		
Polonium (84)	Po-212	7.31E+13	9.48E-15											1.17E-01	
Polonium (84)	Po-212m	4.85E+05	1.43E-06	6.79E+27	9.09E+27	3.46E+28	3.91E+00	1.71E+01	2.54E+00		6.45E+04	4.11E+04	1.36E+04		
Polonium (84)	Po-213	5.20E+12	1.33E-13	5.29E+23	1.32E+25	1.65E+24	1.10E+00	1.42E+00	6.86E-01	2.16E-01	1.64E+00	5.04E-01	2.46E-01	1.17E-01	
Polonium (84)	Po-214	1.33E+11	5.21E-12	6.95E+08	1.76E+11	7.44E+07	7.45E-06	9.60E-06	4.63E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	4.79E-02	
Polonium (84)	Po-215	1.23E+10	5.65E-11	5.97E+23	8.33E+23	2.99E+24	5.69E-03	7.34E-03	3.54E-03	1.30E-01	9.76E-01	3.02E-01	1.47E-01	8.11E-02	
Polonium (84)	Po-216	1.51E+08	4.60E-09	8.55E+11	5.39E+11	1.11E+14	3.09E-04	3.99E-04	1.92E-04	2.05E-03	1.52E-02	4.79E-03	2.36E-03	5.61E-02	
Polonium (84)	Po-218	1.17E+05	5.90E-06	6.14E+02	1.56E+05	6.57E+01	7.42E-06	9.55E-06	4.61E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	3.01E-02	
Praseodymium (59)	Pr-134	3.31E+04	2.09E-05	1.12E+03	1.70E+03	4.57E+02	2.19E-02	3.40E-02	1.37E-02	3.05E-03	2.55E-02	1.22E-03	3.04E-02		
Praseodymium (59)	Pr-134m	2.14E+04	3.23E-05	7.22E+02	1.10E+03	2.95E+02	2.29E-02	3.44E-02	1.44E-02	3.04E-03	2.54E-02	1.22E-03	3.02E-02		
Praseodymium (59)	Pr-135	1.52E+04	4.57E-05	4.77E+02	6.97E+02	1.62E+04	1.42E-01	3.50E-01	9.11E-02	4.19E-02	3.47E-01	1.80E-02	4.29E-01		
Praseodymium (59)	Pr-136	2.78E+04	2.49E-05	2.40E+18	3.25E+18	1.22E+19	1.57E-01	6.62E-01	1.02E-01	9.17E-01	7.44E+00	1.54E+00	4.84E+00		
Praseodymium (59)	Pr-137	4.74E+03	1.46E-04	1.77E+08	3.82E+08	4.83E+07	1.58E-02	2.06E-02	9.82E-03	8.66E-02	7.17E-01	4.49E-02	1.21E+00		
Praseodymium (59)	Pr-138	2.51E+05	2.76E-06	1.02E+26	1.37E+26	5.20E+26	4.32E-01	1.89E+00	2.81E-01		7.15E+03	4.55E+03	4.65E+03		
Praseodymium (59)	Pr-138m	2.86E+03	2.42E-04	1.69E+12	2.30E+12	8.63E+12	1.26E-01	4.47E-01	8.17E-02	1.26E-01	1.03E+00	2.13E-01	6.72E-01		
Praseodymium (59)	Pr-139	1.38E+03	5.03E-04	3.30E+02	4.92E+02	1.48E+02	3.22E-02	4.21E-02	2.00E-02	3.45E-02	2.87E-01	1.49E-02	3.17E-01		
Praseodymium (59)	Pr-140	1.07E+05	6.45E-06	5.04E+22	6.84E+22	2.57E+23	6.59E-01	2.88E+00	4.28E-01		1.09E+04	6.91E+03	7.06E+03		
Praseodymium (59)	Pr-142	3.18E+02	2.18E-03	8.55E+01	1.64E+02	3.42E+01	6.71E-02	8.72E-02	4.17E-02	5.97E-03	4.92E-02	1.01E-02	3.20E-02	2.17E+00	
Praseodymium (59)	Pr-142m	2.49E+04	2.78E-05	6.71E+03	1.29E+04	1.03E+08	6.62E-02	8.61E-02	4.12E-02	5.89E-03	4.86E-02	9.94E-03	3.16E-02	2.17E+00	
Praseodymium (59)	Pr-143	1.86E+01	3.72E-02	2.19E+01	1.52E+03	5.25E+00	2.35E-02	3.03E-02	1.46E-02	6.46E-03	5.33E-02	1.09E-02	3.47E-02	2.41E+00	
Praseodymium (59)	Pr-144	2.11E+04	3.29E-05	1.74E+18	3.47E+19	1.59E+17	2.21E-05	2.85E-05	1.37E-05	1.91E-03	1.56E-02	3.22E-03	1.01E-02	3.61E-01	
Praseodymium (59)	Pr-144m	5.06E+04	1.37E-05	4.03E+18	5.39E+19	3.81E+17	2.21E-05	2.85E-05	1.37E-05	1.91E-03	1.56E-02	3.22E-03	1.01E-02	3.61E-01	
Praseodymium (59)	Pr-145	1.01E+03	6.83E-04	1.02E+12	1.94E+12	4.10E+12	2.45E-01	3.19E-01	1.52E-01	2.24E-02	1.85E-01	3.79E-02	1.20E-01		
Praseodymium (59)	Pr-146	1.51E+04	4.59E-05	1.86E+17	2.52E+17	9.45E+17	2.99E-01	1.10E+00	1.93E-01	3.93E-01	3.20E+00	6.60E-01	2.08E+00		
Praseodymium (59)	Pr-147	2.72E+04	2.55E-05	5.02E+03	9.02E+03	2.20E+03	1.82E-05	2.34E-05	1.13E-05	1.24E-03	1.02E-02	1.81E-04	8.49E-03	4.45E-01	
Praseodymium (59)	Pr-148	1.59E+05	4.36E-06	2.37E+24	3.22E+24	1.21E+25	3.33E-01	1.45E+00	2.16E-01		5.51E+03	3.51E+03	3.58E+03		
Praseodymium (59)	Pr-148m	1.81E+05	3.82E-06	6.51E+23	8.71E+23	3.32E+24	3.72E-01	1.62E+00	2.42E-01		6.14E+03	3.91E+03	3.99E+03		
Platinum (78)	Pt-184	2.11E+04	3.29E-05	1.24E+13	1.69E+13	6.14E+13	1.06E-01	3.15E-01	6.83E-02	6.40E-02	4.23E-01	2.26E-01	1.56E-03		
Platinum (78)	Pt-186	2.92E+03	2.37E-04	1.10E+02	1.63E+02	1.16E+07	1.92E-05	2.47E-05	1.19E-05	7.04E-04	4.81E-03	2.92E-03	6.57E-04		
Platinum (78)	Pt-187	2.58E+03	2.68E-04	9.77E+07	5.44E+07	1.09E+10	2.12E-01	4.42E-01	1.35E-01	5.81E-02	3.46E-01	1.94E-01	1.89E-03		
Platinum (78)	Pt-188	2.48E+01	2.79E-02	2.29E-01	3.64E-01	1.13E-01	2.12E-02	3.05E-02	1.33E-02	7.65E-03	4.24E-02	2.45E-02	3.25E-04		
Platinum (78)	Pt-189	5.58E+02	1.24E-03	2.48E+02	4.46E+01	4.36E+01	7.32E-02	1.02E-01	4.57E-02	2.15E-02	1.27E-01	7.16E-02	7.12E-04		
Platinum (78)	Pt-190	1.07E-12	6.50E+11	7.17E-04	3.08E+00	4.31E-04	8.51E-06	1.10E-05	5.29E-06	5.13E-04	3.14E-03	1.91E-03	1.91E-04		
Platinum (78)	Pt-191	9.03E+01	7.68E-03	7.33E+00	1.51E+01	4.34E+00	1.35E-01	1.88E-01	8.46E-02	2.64E-02	1.29E-01	7.85E-02	3.11E-03	2.69E-01	
Platinum (78)	Pt-193	1.39E-02	5.00E+01	1.02E-01	6.07E+02	6.67E-02	1.17E-01	1.50E-01	7.24E-02	2.12E-01	1.03E+00	6.31E-01	2.50E-02	2.69E+00	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water Total PRG TR=1E-06 (Bq/L)			
Platinum (78)	Pt-193m	5.84E+01	1.19E-02	9.77E+00	5.66E+02	8.77E+00	3.97E-02	5.12E-02	2.47E-02	1.56E-02	7.59E-02	4.63E-02	1.84E-03	1.34E+00	
Platinum (78)	Pt-195m	6.29E+01	1.10E-02	7.03E+00	8.00E+01	5.90E+00	4.93E-02	6.39E-02	3.07E-02	1.23E-02	5.98E-02	3.65E-02	1.45E-03	.	
Platinum (78)	Pt-197	3.05E+02	2.27E-03	5.32E+01	8.61E+02	4.59E+01	1.30E-01	1.69E-01	8.11E-02	1.83E-02	8.94E-02	5.45E-02	2.16E-03	2.69E-01	
Platinum (78)	Pt-197m	3.82E+03	1.82E-04	6.88E+02	1.11E+04	5.94E+02	1.14E-01	1.49E-01	7.07E-02	1.65E-02	8.06E-02	4.92E-02	1.95E-03	2.52E-01	
Platinum (78)	Pt-199	1.18E+04	5.86E-05	4.06E+03	6.36E+03	1.97E+03	6.65E-02	8.90E-02	4.14E-02	1.76E-02	1.45E-01	2.17E-03	6.86E-02	6.66E+02	
Platinum (78)	Pt-200	4.86E+02	1.43E-03	1.78E+01	5.37E+01	5.94E+08	6.30E-02	8.47E-02	3.92E-02	6.65E-03	3.27E-02	1.36E-02	8.00E-04	.	
Platinum (78)	Pt-202	1.38E+02	5.02E-03	2.22E+00	2.66E+01	1.87E+00	1.79E-02	2.32E-02	1.11E-02	1.75E-03	8.55E-03	5.22E-03	2.07E-04	.	
Plutonium (94)	Pu-232	1.08E+04	6.41E-05	3.40E+02	1.45E+03	1.19E-01	1.26E-06	1.62E-06	7.82E-07	1.21E-04	6.75E-04	3.27E-05	8.84E-07	8.06E-04	
Plutonium (94)	Pu-234	6.90E+02	1.00E-03	1.17E+01	2.21E+01	2.20E-03	1.93E-06	2.49E-06	1.20E-06	1.81E-05	1.36E-04	1.95E-05	8.87E-07	2.30E-04	
Plutonium (94)	Pu-235	1.44E+04	4.81E-05	1.69E+05	1.63E+06	3.23E-01	7.31E-07	9.41E-07	4.54E-07	7.70E-05	5.69E-04	4.66E-05	1.27E-06	4.52E-04	
Plutonium (94)	Pu-236	2.42E-01	2.86E+00	6.05E-03	2.59E-02	2.66E-07	8.62E-07	1.11E-06	5.36E-07	8.29E-05	5.11E-04	5.01E-06	6.69E-07	5.12E-04	
Plutonium (94)	Pu-237	5.60E+00	1.24E-01	5.39E+00	7.94E+00	7.38E-04	8.02E-07	1.03E-06	4.99E-07	8.31E-05	6.67E-04	8.47E-06	1.13E-06	2.09E-04	
Plutonium (94)	Pu-238	7.90E-03	8.77E+01	1.87E-02	5.23E-01	2.15E-08	1.33E-06	1.71E-06	8.25E-07	1.73E-05	1.30E-04	3.12E-06	8.48E-07	2.01E-04	
Plutonium (94)	Pu-239	2.87E-05	2.41E+04	1.65E-02	4.52E-01	1.79E-08	6.21E-07	8.00E-07	3.86E-07	6.54E-05	4.91E-04	3.32E-06	1.19E-06	3.91E-04	
Plutonium (94)	Pu-240	1.06E-04	6.56E+03	1.65E-02	4.57E-01	1.79E-08	7.35E-07	9.47E-07	4.57E-07	3.35E-05	2.26E-04	2.82E-06	3.46E-07	1.52E-04	
Plutonium (94)	Pu-241	4.83E-02	1.44E+01	5.80E-01	5.71E+00	2.32E-06	7.07E-07	9.11E-07	4.40E-07	7.23E-05	5.82E-04	6.93E-06	1.07E-06	1.91E-04	
Plutonium (94)	Pu-242	1.85E-06	3.75E+05	1.73E-02	4.67E-01	1.88E-08	1.17E-06	1.50E-06	7.24E-07	1.69E-05	1.27E-04	3.10E-06	7.04E-07	1.06E-04	
Plutonium (94)	Pu-243	1.22E+03	5.66E-04	5.59E+04	1.25E+05	4.24E-01	5.65E-07	7.27E-07	3.51E-07	5.82E-05	4.42E-04	3.02E-06	1.08E-06	3.11E-04	
Plutonium (94)	Pu-244	8.66E-09	8.00E+07	1.86E-03	4.05E-03	8.60E-09	6.30E-07	8.12E-07	3.92E-07	3.08E-05	2.11E-04	1.52E-06	3.36E-07	1.45E-04	
Plutonium (94)	Pu-245	5.78E+02	1.20E-03	4.16E+04	1.56E+05	2.78E-01	6.33E-07	8.15E-07	3.93E-07	6.36E-05	5.14E-04	4.12E-06	1.01E-06	1.76E-04	
Plutonium (94)	Pu-246	2.33E+01	2.97E-02	5.09E-01	7.46E-01	1.14E-04	9.77E-07	1.26E-06	6.07E-07	1.63E-05	1.23E-04	2.22E-06	6.76E-07	1.06E-04	
Radium (88)	Ra-219	2.19E+09	3.17E-10	1.99E+42	2.67E+42	1.02E+43	2.07E+00	9.04E+00	1.35E+00	.	3.38E+04	2.15E+04	4.26E+01	6.66E-04	
Radium (88)	Ra-220	1.22E+09	5.68E-10	1.99E+47	2.67E+47	1.02E+48	7.66E+01	3.34E+02	4.98E+01	.	1.26E+06	8.02E+05	1.51E+03	1.17E-01	
Radium (88)	Ra-221	7.81E+05	8.88E-07	7.92E+16	1.97E+18	2.48E+17	1.00E+00	1.38E+00	6.27E-01	2.16E-01	1.64E+00	5.04E-01	2.45E-01	1.17E-01	
Radium (88)	Ra-222	5.75E+05	1.20E-06	3.01E+03	7.62E+05	3.22E+02	7.45E-06	9.60E-06	4.63E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	4.79E-02	
Radium (88)	Ra-223	2.21E+01	3.13E-02	1.99E-01	2.98E+00	3.70E-04	7.86E-06	1.01E-05	4.89E-06	2.22E-04	1.44E-03	2.83E-04	1.93E-06	6.61E-04	
Radium (88)	Ra-224	6.91E+01	1.00E-02	4.74E-01	1.53E+00	1.64E-03	1.90E-05	2.45E-05	1.18E-05	2.74E-04	1.98E-03	3.83E-04	2.66E-06	6.58E-04	
Radium (88)	Ra-225	1.70E+01	4.08E-02	2.76E-01	2.95E+00	6.26E-04	4.19E-06	5.40E-06	2.61E-06	1.77E-04	1.40E-03	4.05E-04	4.22E-06	5.07E-03	
Radium (88)	Ra-226	4.33E-04	1.60E+03	7.12E-05	7.69E-04	2.74E-07	3.89E-06	5.00E-06	2.42E-06	1.90E-05	1.42E-04	4.35E-05	1.17E-06	2.20E-04	
Radium (88)	Ra-227	8.63E+03	8.03E-05	1.25E+02	1.53E+03	1.56E-01	1.08E-06	1.39E-06	6.70E-07	1.15E-04	8.28E-04	5.45E-05	1.91E-06	6.60E-04	
Radium (88)	Ra-228	1.21E-01	5.75E+00	2.09E-04	1.82E-03	3.68E-07	1.22E-06	1.57E-06	7.59E-07	4.07E-05	2.64E-04	2.11E-05	3.88E-07	1.64E-04	
Radium (88)	Ra-230	3.92E+03	1.77E-04	3.09E+04	3.48E+05	9.40E+01	2.47E-06	3.18E-06	1.53E-06	1.85E-05	1.38E-04	2.13E-05	1.16E-06	2.16E-04	
Rubidium (37)	Rb-77	9.66E+04	7.17E-06	7.94E+03	1.17E+04	2.29E+03	1.09E-01	3.82E-01	7.07E-02	1.83E-01	1.34E+00	2.49E-02	7.37E-02	.	
Rubidium (37)	Rb-78	2.06E+04	3.36E-05	3.69E+17	5.02E+17	1.84E+18	7.58E-02	3.19E-01	4.92E-02	4.55E-01	1.57E+00	1.51E-02	3.31E-01	.	
Rubidium (37)	Rb-78m	6.35E+04	1.09E-05	7.63E+18	1.04E+19	3.81E+19	9.16E-02	3.98E-01	5.95E-02	4.55E+00	1.56E+01	1.51E-01	3.28E+00	.	
Rubidium (37)	Rb-79	1.59E+04	4.36E-05	1.66E+03	2.41E+03	8.53E+02	2.00E-01	7.94E-01	1.30E-01	6.56E-01	2.27E+00	2.18E-02	4.77E-01	.	
Rubidium (37)	Rb-80	6.54E+05	1.06E-06	2.62E+27	3.50E+27	1.33E+28	2.93E-01	1.28E+00	1.90E-01	.	4.84E+03	3.08E+03	1.02E+03	.	
Rubidium (37)	Rb-81	1.33E+03	5.22E-04	5.72E+08	8.66E+08	1.93E+08	4.09E-01	1.06E+00	2.63E-01	4.75E-01	1.64E+00	1.58E-02	3.45E-01	.	
Rubidium (37)	Rb-81m	1.19E+04	8.80E-05	5.15E+09	7.79E+09	1.73E+09	3.82E-01	9.41E-01	2.45E-01	4.16E-01	1.44E+00	1.38E-02	3.02E-01	.	
Rubidium (37)	Rb-82	2.86E+05	2.42E-06	9.14E+24	1.22E+25	4.66E+25	3.16E-01	1.38E+00	2.06E-01	.	5.22E+03	3.33E+03	1.10E+03	.	
Rubidium (37)	Rb-82m	9.38E+02	7.39E-04	1.83E+09	2.22E+09	8.57E+09	1.04E-01	3.58E-01	6.75E-02	1.55E-01	5.36E-01	5.17E-03	1.13E-01	.	
Rubidium (37)	Rb-83	2.93E+00	2.36E-01	8.07E-02	2.24E-01	7.12E-03	4.18E-02	5.61E-02	2.61E-02	1.07E-02	3.67E-02	3.54E-04	7.72E-03	.	
Rubidium (37)	Rb-84	7.72E+00	8.98E-02	1.16E-01	3.01E-01	1.10E-02	2.09E-02	2.80E-02	1.30E-02	6.34E-03	2.19E-02	2.11E-04	4.60E-03	.	
Rubidium (37)	Rb-84m	1.80E+04	3.85E-05	2.71E+02	7.01E+02	2.56E+01	2.04E-02	2.78E-02	1.27E-02	6.33E-03	2.18E-02	2.10E-04	4.59E-03	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water Total PRG TR=1E-06 (Bq/L)			
Rubidium (37)	Rb-86	1.36E+01	5.11E-02	3.67E-01	4.79E+00	1.88E-02	1.37E-02	1.78E-02	8.55E-03	5.61E-03	1.94E-02	1.86E-04	4.07E-03	4.67E+00	
Rubidium (37)	Rb-86m	3.58E+05	1.93E-06	9.70E+03	1.26E+05	4.97E+02	1.35E-02	1.76E-02	8.38E-03	5.61E-03	1.94E-02	1.86E-04	4.07E-03	4.67E+00	
Rubidium (37)	Rb-87	1.41E-11	4.92E+10	2.15E-03	1.35E+01	6.43E-05	5.13E-03	6.61E-03	3.19E-03	1.03E-02	3.55E-02	3.42E-04	7.47E-03	2.33E+00	
Rubidium (37)	Rb-88	2.05E+04	3.38E-05	2.58E+18	3.56E+18	1.14E+19	4.31E-01	1.50E+00	2.79E-01	3.91E-01	1.35E+00	1.30E-02	2.85E-01	.	
Rubidium (37)	Rb-89	2.40E+04	2.88E-05	3.09E+02	4.90E+05	2.78E+00	7.20E-03	9.62E-03	4.49E-03	4.07E-03	9.89E-03	1.82E-03	1.19E-05	8.88E-04	
Rubidium (37)	Rb-90	1.38E+05	5.01E-06	1.01E+03	1.91E+06	6.91E+00	5.28E-04	6.81E-04	3.28E-04	7.90E-04	2.36E-03	4.92E-04	3.14E-06	3.54E-04	
Rubidium (37)	Rb-90m	8.47E+04	8.18E-06	6.21E+02	1.17E+06	4.23E+00	5.27E-04	6.81E-04	3.27E-04	7.90E-04	2.36E-03	4.92E-04	3.14E-06	3.54E-04	
Rhenium (75)	Re-178	2.76E+04	2.51E-05	1.16E+03	1.10E+04	4.88E+02	5.24E-02	8.47E-02	3.30E-02	3.65E-02	4.54E-02	6.20E-03	5.58E-03	.	
Rhenium (75)	Re-179	1.87E+04	3.71E-05	6.94E+04	1.08E+05	3.18E+04	9.01E-02	1.46E-01	5.67E-02	1.45E-01	9.91E-01	2.09E-01	4.73E-02	.	
Rhenium (75)	Re-180	1.49E+05	4.64E-06	2.08E+23	2.80E+23	1.06E+24	2.91E-01	1.27E+00	1.89E-01	.	4.80E+03	3.06E+03	3.69E+01	.	
Rhenium (75)	Re-181	3.05E+02	2.27E-03	7.29E+00	1.47E+01	3.71E+00	9.24E-02	1.40E-01	5.80E-02	2.83E-02	6.68E-02	1.52E-02	9.36E-04	5.56E+00	
Rhenium (75)	Re-182	9.49E+01	7.31E-03	1.09E+00	1.96E+00	5.87E-01	3.96E-02	5.95E-02	2.48E-02	1.12E-02	3.80E-02	2.27E-02	2.93E-04	.	
Rhenium (75)	Re-182m	4.78E+02	1.45E-03	8.96E+00	1.39E+01	1.93E+08	1.62E-01	3.50E-01	1.03E-01	5.90E-02	2.00E-01	1.20E-01	1.54E-03	.	
Rhenium (75)	Re-183	3.61E+00	1.92E-01	2.38E-01	1.65E+00	1.53E-01	1.84E-02	2.38E-02	1.14E-02	1.59E-02	5.40E-02	3.23E-02	4.16E-04	.	
Rhenium (75)	Re-184	6.66E+00	1.04E-01	1.43E-01	2.74E-01	7.84E-02	2.59E-02	3.50E-02	1.62E-02	1.71E-02	5.80E-02	3.47E-02	4.47E-04	.	
Rhenium (75)	Re-184m	1.50E+00	4.63E-01	2.27E-02	5.45E-02	1.29E-02	5.41E-03	7.04E-03	3.36E-03	7.30E-03	2.48E-02	1.48E-02	1.91E-04	.	
Rhenium (75)	Re-186	6.80E+01	1.02E-02	3.38E+00	2.00E+02	2.29E+00	2.07E-05	2.67E-05	1.29E-05	7.19E-04	4.58E-03	2.78E-03	2.30E-04	8.55E-02	
Rhenium (75)	Re-186m	3.47E-06	2.00E+05	8.20E-04	8.81E-02	3.64E-04	2.04E-05	2.63E-05	1.27E-05	6.54E-04	3.86E-03	2.33E-03	1.03E-04	8.55E-02	
Rhenium (75)	Re-187	1.68E-11	4.12E+10	6.35E-01	6.65E+03	2.83E-01	2.08E+00	2.68E+00	1.30E+00	3.15E+00	1.07E+01	6.40E+00	8.24E-02	2.56E+00	
Rhenium (75)	Re-188	3.57E+02	1.94E-03	1.77E+01	2.29E+02	1.17E+01	9.94E-02	1.30E-01	6.18E-02	1.07E-02	3.63E-02	2.17E-02	2.79E-04	5.70E-02	
Rhenium (75)	Re-188m	1.96E+04	3.54E-05	1.96E+04	3.54E-05	9.73E+02	1.26E+04	1.27E+08	9.59E-02	1.26E-01	5.97E-02	1.04E-02	3.55E-02	2.13E-02	
Rhenium (75)	Re-189	2.50E+02	2.77E-03	2.12E+01	1.98E+02	1.38E+01	1.33E-01	1.74E-01	8.27E-02	1.91E-02	6.52E-02	3.90E-02	5.03E-04	.	
Rhenium (75)	Re-190	1.17E+05	5.90E-06	3.90E+22	5.29E+22	1.98E+23	2.64E-01	1.15E+00	1.72E-01	.	4.33E+03	2.76E+03	3.33E+01	.	
Rhenium (75)	Re-190m	1.90E+03	3.65E-04	3.46E+11	5.00E+11	1.79E+12	1.45E-01	3.35E-01	9.29E-02	4.90E-02	1.67E-01	9.97E-02	1.28E-03	.	
Rhodium (45)	Rh-100	2.92E+02	2.37E-03	2.35E+00	3.46E+00	1.16E+00	7.95E-02	1.94E-01	5.09E-02	2.20E-02	1.52E-01	7.92E-02	6.40E-04	.	
Rhodium (45)	Rh-100m	7.92E+04	8.75E-06	6.47E+02	9.53E+02	4.19E+06	8.01E-02	1.96E-01	5.13E-02	2.24E-02	1.55E-01	8.06E-02	6.52E-04	.	
Rhodium (45)	Rh-101	2.10E-01	3.30E+00	2.19E-02	3.60E-02	7.68E-03	1.33E-02	1.72E-02	8.24E-03	2.63E-02	1.82E-01	9.44E-02	7.63E-04	.	
Rhodium (45)	Rh-101m	5.83E+01	1.19E-02	5.24E+00	8.05E+00	2.23E+00	1.16E-01	1.59E-01	7.22E-02	5.04E-02	3.50E-01	1.82E-01	1.47E-03	.	
Rhodium (45)	Rh-102	1.22E+00	5.67E-01	5.27E-02	9.02E-02	1.70E-02	8.74E-03	1.14E-02	5.44E-03	8.44E-03	5.87E-02	3.04E-02	2.46E-04	.	
Rhodium (45)	Rh-102m	1.85E-01	3.74E+00	2.03E-03	3.10E-03	8.73E-04	3.38E-03	4.41E-03	2.10E-03	6.82E-03	4.68E-02	2.43E-02	1.96E-04	.	
Rhodium (45)	Rh-103m	6.49E+03	1.07E-04	1.04E+19	1.07E+20	1.19E+19	2.51E+01	3.25E+01	1.56E+01	5.68E+00	3.94E+01	2.04E+01	1.65E-01	4.66E+00	
Rhodium (45)	Rh-104	5.17E+05	1.34E-06	4.92E+28	6.57E+28	2.51E+29	1.93E+01	8.44E+01	1.26E+01	.	3.45E+05	2.19E+05	1.45E+03	.	
Rhodium (45)	Rh-104m	8.39E+04	8.26E-06	2.38E+23	3.23E+23	1.21E+24	9.57E+00	4.18E+01	6.22E+00	.	1.60E+05	1.02E+05	6.71E+02	.	
Rhodium (45)	Rh-105	1.72E+02	4.04E-03	4.14E+01	8.89E+01	9.35E+00	1.40E-01	1.84E-01	8.72E-02	2.20E-02	1.53E-01	7.94E-02	6.43E-04	4.66E-02	
Rhodium (45)	Rh-106	7.33E+05	9.45E-07	1.76E+28	2.35E+28	8.94E+28	1.61E+00	7.05E+00	1.05E+00	.	2.69E+04	1.71E+04	1.13E+02	.	
Rhodium (45)	Rh-106m	2.78E+03	2.49E-04	1.17E+12	1.59E+12	5.89E+12	1.05E-01	3.52E-01	6.77E-02	9.42E-02	6.52E-01	3.38E-01	2.74E-03	.	
Rhodium (45)	Rh-107	1.68E+04	4.13E-05	1.25E+10	8.85E+13	7.13E+09	1.16E-01	1.61E-01	7.24E-02	1.72E-01	8.70E-01	4.73E-01	3.10E-02	.	
Rhodium (45)	Rh-108	1.30E+06	5.33E-07	7.28E+29	9.74E+29	3.71E+30	1.06E+00	4.63E+00	6.88E-01	.	1.76E+04	1.12E+04	7.40E+01	.	
Rhodium (45)	Rh-109	2.73E+05	2.54E-06	4.78E+08	2.29E+10	3.08E+11	1.10E-01	1.52E-01	6.88E-02	1.44E-02	7.03E-02	3.84E-02	1.27E-02	2.00E+00	
Rhodium (45)	Rh-94	3.10E+05	2.24E-06	1.87E+15	5.52E+15	1.26E+16	5.01E-02	1.87E-01	3.25E-02	9.70E-02	1.05E-02	6.39E-03	2.12E-06	.	
Rhodium (45)	Rh-95	7.26E+04	9.55E-06	2.52E+02	3.25E+03	2.16E+02	6.32E-02	2.04E-01	4.08E-02	6.73E-02	4.19E-03	2.56E-03	8.39E-07	.	
Rhodium (45)	Rh-95m	1.86E+05	3.73E-06	6.46E+02	8.32E+03	8.04E+03	5.67E-02	1.88E-01	3.66E-02	6.73E-02	4.19E-03	2.56E-03	8.39E-07	.	
Rhodium (45)	Rh-96	3.68E+04	1.88E-05	8.57E+18	1.16E+19	4.37E+19	8.71E-02	3.80E-01	5.66E-02	.	1.44E+03	9.17E+02	6.04E+00	.	
Rhodium (45)	Rh-96m	2.41E+05	2.87E-06	7.94E+19	1.08E+20	4.04E+20	9.35E-02	4.08E-01	6.07E-02	.	1.54E+03	9.83E+02	6.48E+00	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Rhodium (45)	Rh-97	1.19E+04	5.84E-05	1.40E+03	2.22E+03	7.00E+02	3.53E-02	5.17E-02	2.21E-02	5.24E-02	8.90E-03	5.38E-03	1.81E-06	4.41E-02	
Rhodium (45)	Rh-97m	7.88E+03	8.79E-05	9.38E+02	1.48E+03	4.68E+02	3.21E-02	4.99E-02	2.01E-02	5.11E-02	8.89E-03	5.37E-03	1.81E-06	4.41E-02	
Rhodium (45)	Rh-98	4.19E+04	1.66E-05	5.37E+19	7.29E+19	2.74E+20	1.91E-01	8.35E-01	1.24E-01	.	3.16E+03	2.01E+03	1.33E+01	.	
Rhodium (45)	Rh-99	1.57E+01	4.41E-02	7.07E-01	1.10E+00	2.88E-01	4.52E-02	6.12E-02	2.82E-02	2.00E-02	1.38E-01	7.18E-02	5.81E-04	.	
Rhodium (45)	Rh-99m	1.29E+03	5.37E-04	1.21E+11	1.65E+11	6.02E+11	4.40E-01	1.31E+00	2.83E-01	2.16E-01	1.49E+00	7.76E-01	6.28E-03	.	
Radon (86)	Rn-207	3.94E+04	1.76E-05	1.55E+03	2.67E+03	6.37E+02	2.56E-03	3.40E-03	1.60E-03	9.12E-03	4.44E-02	2.23E-02	3.15E-03	3.95E+00	
Radon (86)	Rn-209	1.28E+04	5.42E-05	4.71E+02	1.21E+03	3.06E+01	1.02E-05	1.32E-05	6.36E-06	3.39E-05	2.76E-04	9.64E-05	5.65E-05	7.35E+05	
Radon (86)	Rn-210	2.53E+03	2.74E-04	1.36E+01	2.18E+01	5.75E+00	2.85E-04	3.68E-04	1.77E-04	5.26E-04	4.10E-03	1.47E-03	8.70E-04	1.17E+00	
Radon (86)	Rn-211	4.16E+02	1.67E-03	2.12E+00	5.59E+00	9.24E+00	6.51E-04	8.42E-04	4.05E-04	1.96E-03	6.90E-03	3.87E-03	7.73E-05	6.15E+00	
Radon (86)	Rn-212	1.52E+04	4.55E-05	1.82E+02	1.25E+04	7.40E+00	1.02E-05	1.31E-05	6.33E-06	2.68E-05	2.19E-04	7.63E-05	4.60E-05	1.17E-01	
Radon (86)	Rn-215	9.50E+12	7.29E-14	.	.	.	4.24E+01	1.85E+02	2.75E+01	.	7.00E+05	4.46E+05	1.47E+05	.	
Radon (86)	Rn-216	4.86E+11	1.43E-12	.	.	.	.	.	.	.	.	.	.	1.17E-01	
Radon (86)	Rn-217	4.05E+10	1.71E-11	.	.	.	1.10E+00	1.42E+00	6.86E-01	2.16E-01	1.64E+00	5.04E-01	2.46E-01	1.17E-01	
Radon (86)	Rn-218	6.24E+08	1.11E-09	3.26E+06	8.27E+08	3.49E+05	7.45E-06	9.60E-06	4.63E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	4.79E-02	
Radon (86)	Rn-219	5.52E+06	1.26E-07	2.68E+20	3.74E+20	1.34E+21	5.68E-03	7.33E-03	3.53E-03	1.30E-01	1.30E-02	7.98E-03	1.95E-03	8.11E-02	
Radon (86)	Rn-220	3.93E+05	1.76E-06	2.23E+09	1.40E+09	2.88E+11	3.09E-04	3.98E-04	1.92E-04	2.05E-03	2.07E-03	1.14E-03	6.47E-05	5.61E-02	
Radon (86)	Rn-222	6.62E+01	1.05E-02	2.48E-01	1.27E+00	3.42E-02	7.42E-06	9.55E-06	4.61E-06	2.19E-05	1.64E-04	5.62E-05	1.73E-05	3.01E-02	
Radon (86)	Rn-223	1.50E+04	4.62E-05	1.34E+02	2.02E+03	2.51E-01	7.85E-06	1.01E-05	4.88E-06	2.16E-04	1.40E-03	2.80E-04	1.93E-06	6.57E-04	
Ruthenium (44)	Ru-103	6.44E+00	1.08E-01	3.15E-01	4.86E-01	1.44E-01	2.14E-02	2.82E-02	1.33E-02	1.43E-02	1.08E-01	3.20E-02	2.50E-02	1.40E+00	
Ruthenium (44)	Ru-105	1.37E+03	5.07E-04	3.30E+02	7.08E+02	7.45E+01	7.37E-02	1.08E-01	4.62E-02	1.37E-02	9.83E-02	4.01E-02	6.38E-04	4.56E-02	
Ruthenium (44)	Ru-106	6.77E-01	1.02E+00	3.08E-02	1.13E-01	6.65E-03	1.02E-03	1.32E-03	6.37E-04	1.23E-03	9.36E-03	2.76E-03	2.53E-03	3.00E-01	
Ruthenium (44)	Ru-107	9.71E+04	7.13E-06	7.23E+10	5.12E+14	4.13E+10	1.04E-01	1.55E-01	6.50E-02	1.72E-01	8.70E-01	4.73E-01	3.10E-02	.	
Ruthenium (44)	Ru-108	8.01E+04	8.66E-06	5.92E+22	8.03E+22	3.01E+23	9.02E-01	3.94E+00	5.86E-01	.	1.50E+04	9.54E+03	7.38E+01	.	
Ruthenium (44)	Ru-92	9.98E+04	6.94E-06	2.56E+20	3.47E+20	1.30E+21	5.79E-02	2.53E-01	3.76E-02	.	9.55E+02	6.09E+02	2.91E-01	.	
Ruthenium (44)	Ru-94	7.03E+03	9.86E-05	4.33E+13	1.28E+14	2.91E+14	1.16E-01	3.63E-01	7.49E-02	9.70E-02	1.05E-02	6.39E-03	2.12E-06	.	
Ruthenium (44)	Ru-95	3.69E+03	1.88E-04	1.29E+01	1.66E+02	1.10E+01	1.22E-01	3.18E-01	7.84E-02	6.73E-02	4.19E-03	2.56E-03	8.39E-07	.	
Ruthenium (44)	Ru-97	8.72E+01	7.95E-03	1.04E+01	1.63E+01	5.18E+00	4.18E-02	5.48E-02	2.60E-02	5.79E-02	8.92E-03	5.39E-03	1.81E-06	4.41E-02	
Sulfur (16)	S-35	2.89E+00	2.40E-01	5.46E-01	1.07E+04	5.80E-02	3.53E-02	4.55E-02	2.19E-02	1.08E-01	1.66E-01	5.43E-02	4.99E-01	.	
Sulphur (16)	S-37	7.21E+04	9.61E-06	5.58E+20	7.57E+20	2.84E+21	1.02E-01	4.44E-01	6.61E-02	.	1.67E+03	1.06E+03	5.02E+03	.	
Sulfur (16)	S-38	2.14E+03	3.24E-04	1.53E+11	2.62E+11	3.57E+11	6.31E-02	1.47E-01	4.03E-02	4.94E-02	2.78E-02	1.28E-02	1.99E-05	1.85E-02	
Antimony (51)	Sb-111	2.91E+05	2.38E-06	2.25E+04	3.29E+04	3.85E+03	9.50E-02	2.21E-01	6.07E-02	3.90E-02	3.05E-01	1.01E-03	1.58E-01	.	
Antimony (51)	Sb-113	5.46E+04	1.27E-05	1.63E+03	8.29E+03	8.10E+02	1.48E-02	2.00E-02	9.26E-03	1.17E-02	3.11E-02	9.00E-04	4.90E-02	1.36E+01	
Antimony (51)	Sb-114	1.04E+05	6.64E-06	1.11E+22	1.51E+22	5.67E+22	1.25E-01	5.44E-01	8.10E-02	.	2.07E+03	1.32E+03	1.29E+02	.	
Antimony (51)	Sb-115	1.13E+04	6.11E-05	2.47E+16	3.35E+16	1.25E+17	3.87E-01	1.54E+00	2.51E-01	1.07E+00	8.56E+00	7.44E-01	5.33E-01	.	
Antimony (51)	Sb-116	2.31E+04	3.01E-05	7.48E+17	1.02E+18	3.80E+18	1.44E-01	6.10E-01	9.37E-02	9.69E-01	7.76E+00	6.77E-01	4.83E-01	.	
Antimony (51)	Sb-116m	6.04E+03	1.15E-04	2.49E+14	3.38E+14	1.26E+15	1.06E-01	4.22E-01	6.88E-02	3.17E-01	2.55E+00	2.21E-01	1.59E-01	.	
Antimony (51)	Sb-117	2.17E+03	3.20E-04	6.12E+12	8.32E+12	2.94E+13	1.57E+00	3.98E+00	1.00E+00	7.86E-01	6.37E+00	5.50E-01	3.96E-01	.	
Antimony (51)	Sb-118	1.01E+05	6.85E-06	9.43E+22	1.28E+23	4.80E+23	4.40E-01	1.92E+00	2.86E-02	.	7.26E+03	4.63E+03	4.52E+02	.	
Antimony (51)	Sb-118m	1.21E+03	5.71E-04	1.75E+10	2.38E+10	8.66E+10	1.13E-01	3.73E-01	7.30E-02	7.68E-02	6.20E-01	5.37E-02	3.85E-02	.	
Antimony (51)	Sb-119	1.59E+02	4.36E-03	1.80E+03	9.94E+03	3.34E+01	1.23E+00	1.60E+00	7.67E-01	1.07E-01	8.68E-01	7.46E-02	5.40E-02	.	
Antimony (51)	Sb-120	2.29E+04	3.02E-05	3.98E+18	5.41E+18	2.02E+19	7.68E-01	3.07E+00	4.98E-01	2.20E+00	1.77E+01	1.54E+00	1.10E+00	.	
Antimony (51)	Sb-120m	4.39E+01	1.58E-02	4.25E-01	6.21E-01	1.82E-01	4.41E-02	7.32E-02	2.78E-02	1.21E-02	9.79E-02	8.47E-03	6.09E-03	.	
Antimony (51)	Sb-122	9.29E+01	7.46E-03	4.82E+00	7.58E+00	6.72E-01	3.72E-02	4.96E-02	2.32E-02	4.86E-03	3.96E-02	3.40E-03	2.46E-03	2.07E-01	
Antimony (51)	Sb-122m	8.69E+04	7.97E-06	4.51E+03	7.09E+03	6.28E+02	3.71E-02	4.95E-02	2.31E-02	4.86E-03	3.96E-02	3.40E-03	2.46E-03	2.07E-01	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water Total PRG TR=1E-06 (Bq/L)			
Antimony (51)	Sb-124	4.20E+00	1.65E-01	5.06E-02	7.52E-02	1.49E-02	6.91E-03	9.15E-03	4.30E-03	4.07E-03	3.31E-02	2.85E-03	2.06E-03	1.38E-01	
Antimony (51)	Sb-124m	2.35E+05	2.95E-06	3.77E+03	5.61E+03	1.11E+03	9.11E-03	1.22E-02	5.68E-03	5.43E-03	4.41E-02	3.80E-03	2.74E-03	1.84E-01	
Antimony (51)	Sb-124n	1.80E+04	3.84E-05	2.89E+02	4.30E+02	8.53E+01	9.10E-03	1.22E-02	5.67E-03	5.42E-03	4.40E-02	3.79E-03	2.74E-03	1.84E-01	
Antimony (51)	Sb-125	2.51E-01	2.76E+00	1.29E-02	2.22E-02	3.25E-03	5.23E-03	6.76E-03	3.25E-03	1.03E-02	7.05E-02	7.51E-03	5.79E-03	6.80E-01	
Antimony (51)	Sb-126	2.05E+01	3.38E-02	1.80E-01	2.66E-01	6.03E-02	1.44E-02	2.02E-02	9.03E-03	4.14E-03	3.36E-02	2.90E-03	2.09E-03	.	
Antimony (51)	Sb-126m	1.90E+04	3.64E-05	1.19E+03	1.76E+03	4.00E+02	7.02E-02	1.24E-01	4.44E-02	2.85E-02	2.31E-01	1.99E-02	1.44E-02	.	
Antimony (51)	Sb-127	6.57E+01	1.05E-02	1.76E+00	3.42E+00	3.98E-01	1.48E-02	1.95E-02	9.22E-03	4.11E-03	2.69E-02	3.03E-03	2.42E-03	8.93E+00	
Antimony (51)	Sb-128	6.74E+02	1.03E-03	7.25E+07	2.04E+07	9.36E+08	6.27E-02	1.33E-01	3.99E-02	1.38E-02	1.12E-01	9.69E-03	6.99E-03	.	
Antimony (51)	Sb-128m	3.50E+04	1.98E-05	1.03E+11	2.89E+10	1.33E+12	1.62E-01	6.23E-01	1.05E-01	2.73E-01	2.21E+00	1.91E-01	1.37E-01	.	
Antimony (51)	Sb-129	1.38E+03	5.02E-04	1.16E+02	3.26E+03	6.17E+01	1.33E-03	1.72E-03	8.28E-04	3.67E-04	2.22E-03	6.97E-04	4.70E-07	7.40E-06	
Antimony (51)	Sb-130	9.22E+03	7.52E-05	1.96E+15	2.67E+15	9.93E+15	1.00E-01	3.96E-01	6.51E-01	2.58E-01	2.08E+00	1.80E-01	1.29E-01	.	
Antimony (51)	Sb-130m	5.78E+04	1.20E-05	1.90E+20	2.58E+20	9.68E+20	1.26E-01	5.50E-01	8.18E-02	.	2.08E+03	1.32E+03	1.29E+02	.	
Antimony (51)	Sb-131	1.58E+04	4.38E-05	2.54E+02	1.17E+03	1.26E+02	4.30E-03	5.69E-03	2.68E-03	1.13E-03	6.99E-03	2.23E-03	1.45E-06	2.22E-05	
Antimony (51)	Sb-133	1.46E+05	4.76E-06	3.83E+03	8.43E+03	1.19E+05	1.15E-02	1.68E-02	7.20E-03	3.55E-03	2.18E-02	7.03E-03	4.52E-06	7.40E-05	
Scandium (21)	Sc-42m	3.52E+05	1.97E-06	7.82E+24	1.05E+25	3.99E+25	7.99E-02	3.49E-01	5.20E-02	.	1.32E+03	8.40E+02	2.77E+03	.	
Scandium (21)	Sc-43	1.56E+03	4.44E-04	6.28E+11	8.54E+11	3.03E+12	2.12E-01	4.66E-01	1.35E-01	5.20E-02	4.37E-01	2.74E-03	9.17E-01	.	
Scandium (21)	Sc-44	1.53E+03	4.53E-04	9.10E+10	1.24E+11	4.46E+11	1.10E-01	2.76E-01	7.06E-02	3.30E-02	2.77E-01	1.74E-03	5.81E-01	.	
Scandium (21)	Sc-44m	1.04E+02	6.69E-03	1.04E+00	1.53E+00	4.00E-01	2.50E-02	3.67E-02	1.57E-02	3.36E-03	2.83E-02	1.77E-04	5.93E-02	.	
Scandium (21)	Sc-46	3.02E+00	2.30E-01	3.48E-02	5.08E-02	1.55E-02	8.82E-03	1.18E-02	5.50E-03	8.51E-03	7.12E-02	4.49E-04	1.49E-01	7.77E+00	
Scandium (21)	Sc-47	7.55E+01	9.18E-03	2.19E+01	3.37E+01	3.46E+01	7.37E-02	9.64E-02	4.59E-02	1.47E-02	1.24E-01	7.77E-04	2.61E-01	2.33E+01	
Scandium (21)	Sc-48	1.39E+02	4.99E-03	9.44E-01	1.38E+00	4.39E-01	3.70E-02	6.44E-02	2.34E-02	7.32E-03	6.13E-02	3.86E-04	1.29E-01	6.22E+00	
Scandium (21)	Sc-49	6.37E+03	1.09E-04	7.27E+17	1.05E+18	1.08E+18	2.10E+00	2.76E+00	1.30E+00	2.61E-01	2.18E+00	1.38E-02	4.58E+00	.	
Scandium (21)	Sc-50	2.13E+05	3.25E-06	5.42E+23	7.31E+23	2.76E+24	1.03E-01	4.48E-01	6.66E-02	.	1.70E+03	1.08E+03	3.58E+03	.	
Selenium (34)	Se-70	8.86E+03	7.82E-05	4.99E+13	6.80E+13	2.53E+14	6.25E-02	2.26E-01	4.05E-02	9.19E-02	1.68E-01	5.21E-03	1.73E-04	.	
Selenium (34)	Se-71	7.68E+04	9.02E-06	3.02E+03	5.17E+03	1.11E+03	7.46E-02	1.43E-01	4.73E-02	2.25E-02	1.15E-01	2.36E-03	2.46E-05	5.59E+00	
Selenium (34)	Se-72	3.01E+01	2.30E-02	8.11E-02	5.97E-01	8.25E-03	1.08E-02	1.45E-02	6.74E-03	2.01E-03	2.98E-03	9.74E-05	5.30E-06	.	
Selenium (34)	Se-73	8.49E+02	8.16E-04	3.56E+02	2.37E+04	2.65E+02	3.51E-02	4.89E-02	2.19E-02	2.20E-02	4.81E-02	1.41E-03	3.50E-05	7.40E-03	
Selenium (34)	Se-73m	9.15E+03	7.57E-05	3.84E+03	2.55E+05	2.85E+03	3.61E-02	5.02E-02	2.25E-02	2.33E-02	5.49E-02	1.57E-03	3.50E-05	7.40E-03	
Selenium (34)	Se-75	2.11E+00	3.28E-01	1.44E-02	2.40E-01	1.26E-03	4.46E-02	5.93E-02	2.78E-02	7.09E-03	7.08E-03	2.51E-04	1.42E-03	6.67E+00	
Selenium (34)	Se-77m	1.26E+06	5.50E-07	2.75E+31	3.68E+31	1.40E+32	4.40E+00	1.92E+01	2.86E+00	.	7.15E+04	4.55E+04	1.43E+04	.	
Selenium (34)	Se-79	2.35E-06	2.95E+05	3.33E-04	1.16E+01	1.75E-05	1.23E-02	1.59E-02	7.68E-03	8.21E-03	8.20E-03	2.91E-04	1.64E-03	.	
Selenium (34)	Se-79m	9.29E+04	7.46E-06	1.32E+07	4.59E+11	6.94E+05	1.24E-02	1.59E-02	7.68E-03	8.21E-03	8.20E-03	2.91E-04	1.64E-03	.	
Selenium (34)	Se-81	1.97E+04	3.51E-05	2.49E+20	1.00E+21	2.79E+20	6.99E+00	1.06E+01	4.38E+00	1.28E+00	1.28E+00	4.53E-02	2.56E-01	.	
Selenium (34)	Se-81m	6.36E+03	1.09E-04	3.40E+16	2.27E+17	3.30E+16	1.25E+00	1.70E+00	7.77E-01	3.08E-01	3.09E-01	1.09E-02	6.18E-02	.	
Selenium (34)	Se-83	1.63E+04	4.24E-05	8.52E+15	1.28E+16	4.77E+15	1.14E-01	4.02E-01	7.40E-02	2.93E-01	4.85E-01	1.57E-02	7.64E-02	.	
Selenium (34)	Se-83m	3.12E+05	2.22E-06	2.02E+17	3.04E+17	1.08E+17	2.79E-01	8.80E-01	1.80E-01	6.40E-01	4.69E+00	8.70E-02	2.59E-01	.	
Selenium (34)	Se-84	1.17E+05	5.90E-06	1.05E+17	1.42E+17	5.04E+17	1.40E-01	5.51E-01	9.08E-02	3.71E-01	2.72E+00	5.05E-02	1.50E-01	.	
Silicon (14)	Si-31	2.32E+03	2.99E-04	1.48E+14	7.01E+14	1.10E+15	7.50E-01	9.71E-01	4.66E-01	8.01E-02	5.94E-01	3.62E-01	7.73E-02	1.45E+01	
Silicon (14)	Si-32	5.25E-03	1.32E+02	2.75E-04	7.47E-01	1.10E-06	7.56E-04	9.74E-04	4.70E-04	4.31E-03	6.00E-03	1.11E-05	5.51E-04	1.00E-01	
Samarium (62)	Sm-139	1.42E+05	4.89E-06	3.40E+04	5.06E+04	1.52E+04	2.55E-02	3.89E-02	1.60E-02	3.33E-02	2.78E-01	1.47E-02	3.00E-01	.	
Samarium (62)	Sm-140	2.46E+04	2.82E-05	1.12E+03	1.68E+03	5.30E+02	3.06E-02	4.54E-02	1.91E-02	4.09E-03	3.44E-02	5.83E-03	2.24E-02	.	
Samarium (62)	Sm-141	3.57E+04	1.94E-05	9.99E+14	1.36E+15	5.08E+15	1.51E-01	5.94E-01	9.78E-02	3.25E-01	2.58E+00	8.46E-02	1.57E+00	.	
Samarium (62)	Sm-141m	1.61E+04	4.30E-05	4.08E+14	5.55E+14	2.07E+15	1.20E-01	4.62E-01	7.75E-02	2.34E-01	1.89E+00	4.53E-02	1.27E+00	.	
Samarium (62)	Sm-142	5.02E+03	1.38E-04	1.63E+15	2.22E+15	8.08E+15	2.73E-01	7.33E-01	1.75E-01	1.01E-01	8.49E-01	1.18E-02	7.89E-01	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Samarium (62)	Sm-143	4.16E+04	1.66E-05	3.39E+03	5.07E+03	1.75E+03	2.39E-02	3.21E-02	1.49E-02	6.07E-02	4.49E-01	1.78E-01	2.02E-01	.	
Samarium (62)	Sm-143m	3.31E+05	2.09E-06	2.70E+04	4.03E+04	1.40E+04	2.29E-02	3.16E-02	1.43E-02	6.07E-02	4.49E-01	1.78E-01	2.02E-01	.	
Samarium (62)	Sm-145	7.44E-01	9.32E-01	1.28E+00	2.57E+00	1.22E-01	1.26E-02	1.62E-02	7.82E-03	3.11E-02	2.52E-01	5.21E-03	1.72E-01	.	
Samarium (62)	Sm-146	6.73E-09	1.03E+08	3.15E-02	1.61E+00	1.59E-04	1.66E-05	2.14E-05	1.03E-05	1.44E-03	1.19E-02	1.69E-04	1.10E-02	.	
Samarium (62)	Sm-147	6.54E-12	1.06E+11	3.45E-02	1.77E+00	1.74E-04	1.82E-05	2.35E-05	1.13E-05	1.58E-03	1.30E-02	1.84E-04	1.20E-02	5.16E-01	
Samarium (62)	Sm-148	9.90E-17	7.00E+15	2.64E-02	1.67E+00	2.02E-04	1.08E-05	1.39E-05	6.73E-06	9.38E-04	7.68E-03	2.01E-04	5.89E-03	2.12E-01	
Samarium (62)	Sm-151	7.70E-03	9.00E+01	2.18E+00	2.69E+02	1.18E-02	2.48E-02	3.20E-02	1.54E-02	9.25E-02	7.84E-01	1.08E-02	7.29E-01	3.44E+01	
Samarium (62)	Sm-153	1.31E+02	5.31E-03	1.12E+02	1.90E+02	5.64E+00	7.15E-02	9.27E-02	4.45E-02	1.07E-02	9.10E-02	1.25E-03	8.46E-02	6.88E+00	
Samarium (62)	Sm-155	1.63E+04	4.24E-05	1.32E+04	2.17E+04	6.53E+03	1.19E-02	1.54E-02	7.41E-03	2.60E-02	2.17E-01	1.30E-02	3.72E+00	6.66E+02	
Samarium (62)	Sm-156	6.46E+02	1.07E-03	1.15E+01	1.71E+01	5.91E+00	1.29E-02	1.73E-02	8.04E-03	3.46E-03	2.89E-02	1.37E-03	2.09E-01	.	
Samarium (62)	Sm-157	4.54E+04	1.53E-05	1.54E+07	6.61E+03	2.76E+09	1.08E-01	1.63E-01	6.77E-02	1.38E-02	1.15E-01	7.47E-03	3.44E+00	.	
Tin (50)	Sn-106	1.90E+05	3.65E-06	9.05E+20	1.23E+21	4.61E+21	8.40E-02	3.67E-01	5.46E-02	.	1.38E+03	8.80E+02	8.30E+02	.	
Tin (50)	Sn-108	3.54E+04	1.96E-05	5.85E+15	7.94E+15	2.90E+16	9.21E-02	3.67E-01	5.97E-02	2.32E-01	1.29E+00	6.95E-03	9.42E-01	.	
Tin (50)	Sn-109	2.02E+04	3.42E-05	4.38E+02	3.62E+05	6.86E+00	9.54E-03	1.31E-02	5.95E-03	1.07E-02	1.85E-02	2.68E-03	2.25E-05	2.66E-02	
Tin (50)	Sn-110	1.48E+03	4.69E-04	3.17E+10	4.76E+10	1.51E+11	1.11E-01	2.44E-01	7.07E-02	2.34E-02	6.71E-02	1.48E-03	9.78E-02	.	
Tin (50)	Sn-111	1.03E+04	6.72E-05	8.05E+02	1.17E+03	1.36E+02	1.58E-01	2.80E-01	1.00E-01	3.90E-02	3.05E-01	1.01E-03	1.58E-01	.	
Tin (50)	Sn-113	2.20E+00	3.15E-01	6.43E-02	3.27E-01	3.20E-02	1.54E-02	2.00E-02	9.56E-03	1.15E-02	3.05E-02	8.82E-04	4.80E-02	1.33E+01	
Tin (50)	Sn-113m	1.70E+04	4.07E-05	5.47E+02	2.78E+03	2.72E+02	1.69E-02	2.19E-02	1.05E-02	1.26E-02	3.34E-02	9.67E-04	5.26E-02	1.46E+01	
Tin (50)	Sn-117m	1.84E+01	3.77E-02	6.43E-01	6.35E+00	3.39E-01	2.22E-02	2.88E-02	1.38E-02	1.17E-02	3.07E-02	9.42E-04	4.91E-02	.	
Tin (50)	Sn-119m	8.63E-01	8.03E-01	6.90E-02	8.39E+01	3.66E-02	1.88E-02	2.42E-02	1.17E-02	2.28E-02	5.99E-02	1.84E-03	9.58E-02	.	
Tin (50)	Sn-121	2.25E+02	3.09E-03	2.67E+01	1.94E+05	1.41E+01	2.08E-01	2.68E-01	1.29E-01	3.39E-02	8.88E-02	2.73E-03	1.42E-01	.	
Tin (50)	Sn-121m	1.58E-02	4.39E+01	2.39E-03	6.84E+00	9.12E-04	5.21E-03	6.70E-03	3.24E-03	1.46E-02	3.82E-02	1.17E-03	6.11E-02	.	
Tin (50)	Sn-123	1.96E+00	3.54E-01	2.50E-02	8.03E+00	1.33E-02	4.93E-03	6.35E-03	3.06E-03	3.66E-03	9.59E-03	2.95E-04	1.54E-02	.	
Tin (50)	Sn-123m	9.09E+03	7.62E-05	4.84E+16	7.25E+16	2.47E+17	1.59E+00	3.49E+00	1.01E+00	6.67E-01	1.74E+00	5.37E-02	2.79E+00	.	
Tin (50)	Sn-125	2.62E+01	2.64E-02	1.81E-01	1.23E+00	8.34E-02	3.84E-03	4.98E-03	2.39E-03	2.06E-03	6.16E-03	2.02E-04	3.77E-03	5.71E-01	
Tin (50)	Sn-125m	3.83E+04	1.81E-05	1.97E+03	3.39E+03	4.95E+02	5.20E-03	6.75E-03	3.24E-03	1.03E-02	7.05E-02	7.51E-03	5.79E-03	6.80E-01	
Tin (50)	Sn-126	3.01E-06	2.30E+05	1.74E-04	7.38E-04	5.71E-05	5.41E-04	6.98E-04	3.36E-04	1.88E-03	5.16E-03	1.61E-04	5.32E-03	.	
Tin (50)	Sn-127	2.89E+03	2.40E-04	7.72E+01	1.50E+02	1.75E+01	1.33E-02	1.85E-02	8.30E-03	3.86E-03	2.32E-02	1.91E-03	2.40E-03	8.93E+00	
Tin (50)	Sn-127m	8.82E+04	7.86E-06	2.36E+03	4.59E+03	5.34E+02	1.45E-02	1.93E-02	9.01E-03	4.11E-03	2.69E-02	3.03E-03	2.42E-03	8.93E+00	
Tin (50)	Sn-128	6.17E+03	1.12E-04	1.61E+10	4.53E+09	2.08E+11	1.13E-01	3.58E-01	7.32E-02	8.29E-02	2.73E-01	9.12E-03	1.08E-01	.	
Tin (50)	Sn-129	1.63E+05	4.24E-06	1.37E+04	3.86E+05	8.95E+03	1.33E-03	1.72E-03	8.25E-04	3.67E-04	2.22E-03	6.97E-04	4.70E-07	7.40E-06	
Tin (50)	Sn-130	9.79E+04	7.08E-06	1.33E+20	1.80E+20	6.77E+20	9.48E-02	4.14E-01	6.16E-02	.	1.56E+03	9.95E+02	1.28E+02	.	
Tin (50)	Sn-130m	2.14E+05	3.23E-06	5.08E+16	6.89E+16	2.57E+17	8.13E-02	3.30E-01	5.28E-02	3.00E-01	2.41E+00	2.10E-01	1.50E-01	.	
Strontium (38)	Sr-79	1.62E+05	4.28E-06	1.67E+04	2.46E+04	8.58E+03	1.20E-01	4.95E-01	7.81E-02	6.56E-01	2.27E+00	2.18E-02	4.42E-01	.	
Strontium (38)	Sr-80	3.43E+03	2.02E-04	7.67E+12	1.16E+13	5.70E+12	1.42E-01	3.41E-01	9.09E-02	4.22E-02	1.02E-01	2.03E-02	1.23E-04	.	
Strontium (38)	Sr-81	1.63E+04	4.24E-05	7.04E+09	1.07E+10	2.37E+09	1.50E-01	4.82E-01	9.69E-02	2.11E-01	5.88E-01	1.45E-02	1.10E-03	.	
Strontium (38)	Sr-82	9.97E+00	6.95E-02	4.25E-02	3.29E-01	4.68E-04	5.05E-03	6.58E-03	3.14E-03	1.67E-03	4.05E-03	8.02E-04	4.86E-06	.	
Strontium (38)	Sr-83	1.87E+02	3.70E-03	2.24E+00	5.22E+00	9.12E-02	3.06E-02	4.28E-02	1.91E-02	7.22E-03	2.19E-02	3.43E-04	6.48E-05	.	
Strontium (38)	Sr-85	3.90E+00	1.78E-01	1.21E-01	2.94E-01	2.65E-03	6.59E-02	9.08E-02	4.12E-02	2.47E-02	5.97E-02	1.19E-02	7.17E-05	4.00E-02	
Strontium (38)	Sr-85m	5.39E+03	1.29E-04	1.93E+02	4.69E+02	4.23E+00	7.27E-02	1.03E-01	4.54E-02	2.83E-02	6.84E-02	1.36E-02	8.21E-05	4.39E-02	
Strontium (38)	Sr-87m	2.16E+03	3.21E-04	2.15E-03	1.35E+01	6.43E-05	5.78E-01	1.16E+00	3.67E-01	4.32E-01	1.09E+00	7.70E-02	1.44E-03	7.78E+02	
Strontium (38)	Sr-89	5.01E+00	1.38E-01	6.44E-02	1.02E+02	5.79E-04	7.59E-03	9.78E-03	4.72E-03	4.09E-03	9.93E-03	1.97E-03	1.19E-05	8.88E-04	
Strontium (38)	Sr-90	2.41E-02	2.88E+01	1.77E-04	3.33E-01	1.20E-06	5.30E-04	6.82E-04	3.29E-04	7.90E-04	2.36E-03	4.92E-04	3.14E-06	3.54E-04	
Strontium (38)	Sr-91	6.30E+02	1.10E-03	2.60E+02	4.35E+03	2.16E+01	6.34E-03	8.28E-03	3.94E-03	2.66E-03	1.55E-02	4.11E-03	4.46E-05	8.40E-03	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident Finfish PRG	Resident Tap Water PRG	Farmer Tap Water PRG	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )						
Strontium (38)	Sr-92	2.28E+03	3.04E-04	1.41E+11	2.05E+11	1.98E+11	7.25E-02	1.24E-01	4.58E-02	1.10E-02	4.26E-02	9.45E-03	6.78E-05	8.66E-03	
Strontium (38)	Sr-93	4.91E+04	1.41E-05	7.10E+09	5.42E+09	4.27E+09	9.27E-03	1.25E-02	5.78E-03	5.70E-03	4.63E-02	1.29E-02	2.67E-03	1.56E-01	
Strontium (38)	Sr-94	2.90E+05	2.39E-06	3.52E+19	4.77E+19	1.79E+20	1.43E-01	5.77E-01	9.29E-02	3.88E-01	3.12E+00	1.07E+00	1.43E-01	.	
Tantalum (73)	Ta-170	5.39E+04	1.29E-05	4.10E+02	5.99E+02	2.36E+02	3.91E-02	7.56E-02	2.48E-02	9.85E-03	8.26E-02	1.25E-03	3.13E-01	.	
Tantalum (73)	Ta-172	9.90E+03	7.00E-05	1.19E+02	1.75E+02	5.66E+01	2.44E-03	3.21E-03	1.52E-03	4.84E-03	4.05E-02	5.60E-04	1.33E-01	.	
Tantalum (73)	Ta-173	1.93E+03	3.58E-04	1.22E+02	1.80E+02	5.69E+01	1.62E-02	2.16E-02	1.01E-02	1.51E-02	1.27E-01	2.17E-03	3.12E-01	.	
Tantalum (73)	Ta-174	5.33E+03	1.30E-04	2.58E+14	3.51E+14	9.17E+14	2.27E-05	2.93E-05	1.41E-05	9.39E-04	7.56E-03	8.03E-05	1.88E-02	.	
Tantalum (73)	Ta-175	5.78E+02	1.20E-03	4.95E+01	1.48E+01	2.15E+01	3.44E-02	4.92E-02	2.15E-02	1.81E-02	1.51E-01	2.26E-03	2.18E-01	.	
Tantalum (73)	Ta-176	7.50E+02	9.24E-04	4.27E+09	2.32E+08	3.26E+09	1.07E-01	2.84E-01	6.87E-02	4.45E-02	3.72E-01	7.56E-02	2.90E-01	.	
Tantalum (73)	Ta-177	1.07E+02	6.46E-03	9.56E+01	1.43E+02	4.66E+01	4.78E-01	6.43E-01	2.98E-01	8.66E-02	7.27E-01	1.47E-01	5.67E-01	.	
Tantalum (73)	Ta-178	3.91E+04	1.77E-05	2.75E+21	3.73E+21	1.40E+22	3.43E+00	1.50E+01	2.23E+00	.	5.57E+04	3.55E+04	4.35E+04	.	
Tantalum (73)	Ta-178m	2.57E+03	2.69E-04	5.99E+12	8.13E+12	3.05E+13	2.53E-01	7.20E-01	1.63E-01	1.80E-01	1.50E+00	3.06E-01	1.17E+00	.	
Tantalum (73)	Ta-179	3.81E-01	1.82E+00	1.41E+00	2.20E+00	6.49E-01	1.28E-01	1.66E-01	7.97E-02	1.60E-01	1.34E+00	2.72E-01	1.05E+00	.	
Tantalum (73)	Ta-180	7.45E+02	9.31E-04	7.50E+11	3.63E+10	4.67E+11	1.10E+00	1.51E+00	6.84E-01	1.65E-01	1.39E+00	2.81E-01	1.08E+00	.	
Tantalum (73)	Ta-182	2.21E+00	3.14E-01	4.05E-02	5.95E-02	2.06E-02	6.07E-03	7.94E-03	3.78E-03	6.67E-03	5.60E-02	1.13E-02	4.37E-02	2.89E+00	
Tantalum (73)	Ta-182m	2.30E+04	3.01E-05	4.22E+02	6.19E+02	2.14E+02	6.04E-03	7.93E-03	3.76E-03	6.65E-03	5.58E-02	1.13E-02	4.36E-02	2.89E+00	
Tantalum (73)	Ta-183	4.96E+01	1.40E-02	5.55E+00	8.52E+00	2.60E+00	2.49E-02	3.25E-02	1.55E-02	6.02E-03	5.06E-02	1.02E-02	3.95E-02	.	
Tantalum (73)	Ta-184	6.98E+02	9.93E-04	5.06E+08	8.47E+07	2.23E+09	8.40E-02	1.47E-01	5.31E-02	1.49E-02	1.25E-01	2.53E-02	9.73E-02	.	
Tantalum (73)	Ta-185	7.37E+03	9.40E-05	1.70E+02	2.88E+06	6.92E+01	1.66E-02	2.14E-02	1.03E-02	1.67E-02	2.12E-02	2.87E-03	3.20E-03	1.67E+00	
Tantalum (73)	Ta-186	3.47E+04	2.00E-05	1.57E+19	2.13E+19	8.01E+19	2.42E-01	9.89E-01	1.57E-01	9.55E-01	7.91E+00	1.62E+00	6.17E+00	.	
Terbium (65)	Tb-146	9.50E+05	7.29E-07	8.92E+03	1.31E+04	4.58E+03	1.66E-05	2.13E-05	1.03E-05	1.15E-03	9.48E-03	1.64E-04	9.22E-03	.	
Terbium (65)	Tb-147	3.70E+03	1.87E-04	5.07E+01	7.40E+01	2.60E+01	1.82E-05	2.34E-05	1.13E-05	1.37E-03	1.13E-02	1.81E-04	1.08E-02	5.16E-01	
Terbium (65)	Tb-147m	1.95E+05	3.56E-06	2.67E+03	3.89E+03	1.37E+03	1.82E-05	2.34E-05	1.13E-05	1.39E-03	1.14E-02	1.82E-04	1.09E-02	5.16E-01	
Terbium (65)	Tb-148	6.07E+03	1.14E-04	1.40E+04	1.22E+06	3.09E+03	1.51E-05	1.95E-05	9.39E-06	1.37E-03	1.12E-02	4.40E-03	7.36E-03	.	
Terbium (65)	Tb-148m	1.66E+05	4.19E-06	3.81E+05	3.33E+07	8.41E+04	1.51E-05	1.95E-05	9.39E-06	1.38E-03	1.13E-02	4.63E-03	7.37E-03	.	
Terbium (65)	Tb-149	1.47E+03	4.70E-04	5.70E+01	8.38E+01	2.88E+01	9.52E-03	1.28E-02	5.93E-03	1.19E-02	9.95E-02	9.00E-03	1.10E-01	.	
Terbium (65)	Tb-149m	8.76E+04	7.91E-06	4.40E+03	6.47E+03	2.25E+03	3.49E-02	5.20E-02	2.19E-02	1.48E-02	1.24E-01	2.16E-02	1.07E-01	.	
Terbium (65)	Tb-150	1.74E+03	3.97E-04	2.61E+06	3.84E+06	1.88E+06	8.81E-06	1.13E-05	5.48E-06	7.37E-04	6.04E-03	1.63E-04	4.69E-03	.	
Terbium (65)	Tb-150m	6.28E+04	1.10E-05	3.44E+09	2.97E+11	7.13E+08	8.81E-06	1.13E-05	5.48E-06	7.45E-04	6.11E-03	1.63E-04	4.70E-03	.	
Terbium (65)	Tb-151	3.45E+02	2.01E-03	8.94E+00	1.31E+01	4.58E+00	3.25E-02	4.47E-02	2.03E-02	1.81E-02	1.52E-01	1.62E-02	1.91E-01	5.43E+03	
Terbium (65)	Tb-151m	8.74E+05	7.93E-07	6.27E+05	9.47E+05	3.23E+05	3.31E-02	4.57E-02	2.06E-02	1.88E-02	1.58E-01	1.72E-02	1.92E-01	5.82E+03	
Terbium (65)	Tb-152	3.47E+02	2.00E-03	5.48E+00	8.00E+00	2.81E+00	7.57E-06	9.76E-06	4.71E-06	6.08E-04	4.98E-03	1.90E-04	3.74E-03	2.12E-01	
Terbium (65)	Tb-152m	8.67E+04	7.99E-06	1.73E+03	2.53E+03	1.17E+08	7.57E-06	9.76E-06	4.71E-06	6.13E-04	5.02E-03	1.91E-04	3.75E-03	2.12E-01	
Terbium (65)	Tb-153	1.08E+02	6.41E-03	8.79E+00	1.30E+01	4.47E+00	2.35E-02	3.08E-02	1.46E-02	1.77E-02	1.49E-01	1.75E-02	1.68E-01	1.44E+01	
Terbium (65)	Tb-154	2.82E+02	2.45E-03	2.74E+00	3.99E+00	1.41E+00	8.41E-02	1.86E-01	5.37E-02	2.22E-02	1.86E-01	1.23E-02	1.11E+00	.	
Terbium (65)	Tb-155	4.75E+01	1.46E-02	1.21E+01	1.79E+01	6.07E+00	1.70E-01	2.30E-01	1.06E-01	3.76E-02	3.16E-01	2.08E-02	1.89E+00	.	
Terbium (65)	Tb-156	4.73E+01	1.47E-02	5.89E-01	8.60E-01	3.02E-01	4.11E-02	6.33E-02	2.58E-02	1.13E-02	9.46E-02	6.25E-03	5.67E-01	.	
Terbium (65)	Tb-156m	2.49E+02	2.79E-03	3.09E+00	4.51E+00	1.58E+00	3.59E-02	5.39E-02	2.25E-02	9.75E-03	8.16E-02	5.39E-03	4.90E-01	.	
Terbium (65)	Tb-156n	1.15E+03	6.05E-04	1.43E+01	2.08E+01	7.32E+00	3.82E-02	5.80E-02	2.40E-02	1.03E-02	8.65E-02	5.72E-03	5.19E-01	.	
Terbium (65)	Tb-157	9.76E-03	7.10E+01	1.14E+00	2.43E+00	3.03E-01	6.21E-02	8.00E-02	3.86E-02	2.48E-01	2.09E+00	1.38E-01	1.25E+01	.	
Terbium (65)	Tb-158	3.85E-03	1.80E+02	1.24E-03	1.89E-03	4.22E-04	1.33E-03	1.72E-03	8.28E-04	1.09E-02	9.16E-02	6.05E-03	5.49E-01	.	
Terbium (65)	Tb-160	3.50E+00	1.98E-01	7.36E-02	1.08E-01	3.74E-02	7.43E-03	9.73E-03	4.62E-03	5.92E-03	4.97E-02	3.27E-03	2.98E-01	2.22E+01	
Terbium (65)	Tb-161	3.66E+01	1.89E-02	6.25E+01	1.68E+02	2.11E+02	4.00E-02	5.16E-02	2.49E-02	1.04E-02	8.78E-02	5.78E-03	5.27E-01	.	
Terbium (65)	Tb-162	4.79E+04	1.45E-05	2.63E+20	3.57E+20	1.34E+21	3.15E-01	1.38E+00	2.05E-01	.	5.20E+03	3.31E+03	3.12E+04	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Terbium (65)	Tb-163	1.87E+04	3.71E-05	8.09E+17	1.10E+18	4.12E+18	4.32E-01	1.67E+00	2.80E-01	1.41E+00	1.17E+01	7.81E-01	7.02E+01	.	
Terbium (65)	Tb-164	1.21E+05	5.71E-06	4.42E+22	6.00E+22	2.25E+23	2.39E-01	6.07E-01	9.04E-02	.	2.30E+03	1.46E+03	1.38E+04	.	
Terbium (65)	Tb-165	1.73E+05	4.01E-06	1.34E+16	1.86E+16	5.72E+16	2.77E-01	7.42E-01	1.78E-01	1.28E-01	1.08E+00	4.66E-02	1.61E+00	5.62E+00	
Techneium (43)	Tc-101	2.57E+04	2.70E-05	1.56E+19	4.28E+19	1.03E+20	9.81E-01	3.59E+00	6.36E-01	1.80E+00	8.52E-02	5.23E-02	1.70E-05	.	
Techneium (43)	Tc-102	4.14E+06	1.67E-07	2.56E+33	3.42E+33	1.30E+34	3.39E+00	1.48E+01	2.20E+00	.	5.82E+04	3.71E+04	1.16E+01	.	
Techneium (43)	Tc-102m	8.37E+04	8.28E-06	2.56E+21	3.48E+21	1.31E+22	1.33E-01	5.81E-01	8.64E-02	.	2.20E+03	1.40E+03	4.39E-01	.	
Techneium (43)	Tc-104	1.99E+04	3.48E-05	8.88E+18	1.91E+19	5.42E+19	1.39E-01	5.64E-01	9.05E-02	3.87E-01	1.83E-02	1.12E-02	3.66E-06	.	
Techneium (43)	Tc-105	4.79E+04	1.45E-05	1.16E+04	2.48E+04	2.61E+03	6.29E-02	1.02E-01	3.96E-02	1.37E-02	9.83E-02	4.01E-02	6.37E-04	4.56E-02	
Techneium (43)	Tc-91	1.16E+05	5.97E-06	1.23E+07	2.91E+07	4.51E+06	3.07E-02	5.11E-02	1.94E-02	1.40E-01	9.06E-01	1.22E-01	7.55E-02	.	
Techneium (43)	Tc-91m	1.10E+05	6.28E-06	1.37E+05	3.00E+05	6.00E+04	1.61E-02	2.33E-02	1.01E-02	3.17E-02	2.45E-01	2.34E-02	1.09E-01	.	
Techneium (43)	Tc-92	8.57E+04	8.09E-06	1.57E+21	2.14E+21	8.02E+21	8.83E-02	3.86E-01	5.74E-02	.	1.46E+03	9.28E+02	2.92E-01	.	
Techneium (43)	Tc-93	2.21E+03	3.14E-04	6.82E+04	1.35E+08	3.08E+04	1.91E-02	2.62E-02	1.19E-02	1.43E-02	1.02E-02	5.66E-03	2.41E-06	6.31E+01	
Techneium (43)	Tc-93m	8.37E+03	8.28E-05	2.59E+05	5.13E+08	1.17E+05	1.84E-02	2.59E-02	1.15E-02	1.42E-02	8.90E-03	4.98E-03	2.04E-06	6.31E+01	
Techneium (43)	Tc-94	1.24E+03	5.57E-04	2.14E+10	9.88E+10	1.59E+11	1.12E-01	3.65E-01	7.21E-02	8.55E-02	4.05E-03	2.48E-03	8.09E-07	.	
Techneium (43)	Tc-94m	7.00E+03	9.89E-05	2.31E+14	6.97E+14	1.56E+15	1.61E-01	5.98E-01	1.04E-01	2.24E-01	1.06E-02	6.50E-03	2.12E-06	.	
Techneium (43)	Tc-95	3.04E+02	2.28E-03	1.11E+00	1.35E+01	9.43E-01	2.88E-01	6.89E-01	1.84E-01	9.38E-02	4.44E-03	2.72E-03	8.87E-07	.	
Techneium (43)	Tc-95m	4.15E+00	1.67E-01	5.18E-03	2.15E-01	4.70E-03	4.51E-02	6.20E-02	2.81E-02	2.93E-02	1.38E-03	8.50E-04	2.77E-07	.	
Techneium (43)	Tc-96	5.91E+01	1.17E-02	3.90E-02	8.25E-01	3.45E-02	6.10E-02	1.14E-01	3.87E-02	1.60E-02	7.58E-04	4.65E-04	1.52E-07	2.22E-03	
Techneium (43)	Tc-96m	7.07E+03	9.80E-05	4.76E+00	1.01E+02	4.21E+00	6.14E-02	1.15E-01	3.89E-02	1.62E-02	7.65E-04	4.70E-04	1.53E-07	2.24E-03	
Techneium (43)	Tc-97	2.67E-07	2.60E+06	3.26E-04	2.15E+01	1.98E-04	4.78E-02	6.15E-02	2.97E-02	1.92E-01	9.08E-03	5.57E-03	1.82E-06	4.44E-02	
Techneium (43)	Tc-97m	2.81E+00	2.47E-01	2.71E-03	3.93E+02	2.53E-03	1.19E-02	1.53E-02	7.40E-03	1.96E-02	9.27E-04	5.69E-04	1.85E-07	6.34E-03	
Techneium (43)	Tc-98	1.65E-07	4.20E+06	1.34E-05	1.01E-03	7.97E-06	1.93E-03	2.50E-03	1.20E-03	8.01E-03	3.79E-04	2.33E-04	7.58E-08	.	
Techneium (43)	Tc-99	3.28E-06	2.11E+05	3.20E-05	2.84E+01	1.94E-05	6.03E-03	7.77E-03	3.75E-03	1.88E-02	8.92E-04	5.47E-04	1.78E-07	6.66E-03	
Techneium (43)	Tc-99m	1.01E+03	6.87E-04	9.85E+03	8.61E+09	5.98E+03	6.01E-03	7.75E-03	3.74E-03	1.83E-02	8.67E-04	5.32E-04	1.73E-07	6.37E-03	
Tellurium (52)	Te-113	2.14E+05	3.23E-06	6.40E+03	3.25E+04	3.18E+03	1.35E-02	1.94E-02	8.46E-03	1.17E-02	3.11E-02	9.00E-04	4.90E-02	1.36E+01	
Tellurium (52)	Te-114	2.40E+04	2.89E-05	7.48E+17	1.02E+18	3.81E+18	8.22E-02	3.35E-01	5.34E-02	4.54E-01	1.65E+00	4.32E-01	7.87E-01	.	
Tellurium (52)	Te-115	6.28E+04	1.10E-05	1.12E+17	1.52E+17	5.66E+17	1.09E-01	4.62E-01	7.07E-02	1.07E+00	8.54E+00	7.44E-01	5.32E-01	.	
Tellurium (52)	Te-115m	5.44E+04	1.27E-05	9.34E+16	1.27E+17	4.73E+17	9.67E-02	4.12E-01	6.28E-02	1.07E+00	8.53E+00	7.44E-01	5.32E-01	.	
Tellurium (52)	Te-116	2.44E+03	2.84E-04	1.53E+12	2.12E+12	7.79E+12	1.12E-01	3.29E-01	7.24E-02	6.28E-02	2.38E-01	5.85E-02	9.46E-02	.	
Tellurium (52)	Te-117	5.87E+03	1.18E-04	1.01E+13	1.37E+13	4.85E+13	1.80E-01	6.42E-01	1.16E-01	2.49E-01	1.10E+00	2.13E-01	2.44E-01	.	
Tellurium (52)	Te-118	4.22E+01	1.64E-02	4.71E-01	1.94E+00	2.83E-01	1.75E-02	2.32E-02	1.09E-02	2.93E-03	1.07E-02	2.80E-03	5.14E-03	.	
Tellurium (52)	Te-119	3.78E+02	1.83E-03	1.14E+01	1.78E+01	7.94E+01	2.28E-01	4.52E-01	1.45E-01	4.52E-02	2.15E-01	3.74E-02	3.87E-02	.	
Tellurium (52)	Te-119m	5.38E+01	1.29E-02	7.53E-01	1.23E+00	3.84E-01	7.16E-02	1.19E-01	4.52E-02	1.78E-02	7.14E-02	1.60E-02	2.21E-02	.	
Tellurium (52)	Te-121	1.32E+01	5.25E-02	4.93E-01	8.69E-01	2.64E-01	9.87E-02	1.43E-01	6.18E-02	3.63E-02	1.32E-01	3.45E-02	6.33E-02	.	
Tellurium (52)	Te-121m	1.64E+00	4.22E-01	3.28E-02	8.97E-02	1.88E-02	1.01E-02	1.32E-02	6.27E-03	7.22E-03	2.62E-02	6.87E-03	1.26E-02	.	
Tellurium (52)	Te-123	1.16E-15	6.00E+14	1.30E-02	5.05E+01	5.60E-03	7.47E-02	9.62E-02	4.64E-02	5.72E-02	2.05E-01	5.41E-02	9.84E-02	.	
Tellurium (52)	Te-123m	2.12E+00	3.27E-01	1.27E-01	7.68E-01	7.89E-02	1.10E-02	1.42E-02	6.84E-03	1.08E-02	3.93E-02	1.03E-02	1.89E-02	.	
Tellurium (52)	Te-125m	4.41E+00	1.57E-01	4.15E-01	1.01E+02	2.74E-01	1.59E-02	2.05E-02	9.87E-03	1.60E-02	5.84E-02	1.53E-02	2.80E-02	1.07E+01	
Tellurium (52)	Te-127	6.49E+02	1.07E-03	9.81E+08	6.79E+09	7.53E+10	3.38E-01	4.37E-01	2.10E-01	5.06E-02	1.85E-01	4.84E-02	8.89E-02	1.60E+01	
Tellurium (52)	Te-127m	2.32E+00	2.99E-01	7.63E-02	1.58E+01	5.05E-02	6.50E-03	8.38E-03	4.04E-03	5.60E-03	2.04E-02	5.34E-03	9.79E-03	2.92E+00	
Tellurium (52)	Te-129	5.23E+03	1.32E-04	3.74E+07	4.05E+10	1.15E+07	1.40E-03	1.81E-03	8.73E-04	3.82E-04	2.34E-03	7.66E-04	4.70E-07	7.40E-06	
Tellurium (52)	Te-129m	7.53E+00	9.21E-02	1.44E-01	4.05E+00	9.37E-02	1.19E-03	1.53E-03	7.38E-04	3.44E-04	1.97E-03	6.21E-04	4.70E-07	7.40E-06	
Tellurium (52)	Te-131	1.46E+04	4.76E-05	2.67E+02	1.47E+03	1.29E+02	4.50E-03	5.84E-03	2.80E-03	1.16E-03	7.19E-03	2.33E-03	1.45E-06	2.22E-05	
Tellurium (52)	Te-131m	2.02E+02	3.42E-03	1.40E+00	3.75E+00	7.29E-01	3.76E-03	4.91E-03	2.34E-03	9.85E-04	5.54E-03	1.70E-03	1.45E-06	2.22E-05	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident Finfish PRG	Resident Tap Water PRG	Farmer Tap Water PRG	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )						
Tellurium (52)	Te-132	7.89E+01	8.78E-03	5.03E-01	1.13E+00	2.80E-01	9.65E-03	1.31E-02	6.02E-03	2.96E-03	1.10E-02	2.89E-03	7.93E-05	6.66E-04	
Tellurium (52)	Te-133	2.91E+04	2.38E-05	7.65E+02	1.69E+03	2.37E+04	1.29E-02	1.75E-02	8.04E-03	3.57E-03	2.21E-02	7.14E-03	4.52E-06	7.40E-05	
Tellurium (52)	Te-133m	6.57E+03	1.05E-04	1.73E+02	3.80E+02	8.62E+01	1.21E-02	1.67E-02	7.53E-03	3.43E-03	2.06E-02	6.55E-03	4.52E-06	7.40E-05	
Tellurium (52)	Te-134	8.71E+03	7.95E-05	7.49E+13	1.02E+14	3.82E+14	7.58E-02	2.11E-01	4.88E-02	1.06E-01	4.76E-01	1.33E-01	2.87E-04	7.40E-04	
Thorium (90)	Th-223	3.64E+07	1.90E-08	4.07E+38	5.45E+38	2.07E+39	1.53E+00	6.70E+00	9.97E-01	.	2.49E+04	1.59E+04	4.17E+01	6.66E-04	
Thorium (90)	Th-224	2.08E+07	3.33E-08	2.42E+38	3.23E+38	1.23E+39	1.36E+01	5.95E+01	8.85E+00	.	2.22E+05	1.41E+05	1.18E+03	1.17E-01	
Thorium (90)	Th-226	1.19E+04	5.82E-05	6.23E+01	1.58E+04	6.66E+00	7.42E-06	9.55E-06	4.61E-06	2.19E-05	1.72E-04	5.71E-05	3.17E-05	4.79E-02	
Thorium (90)	Th-227	1.35E+01	5.12E-02	1.16E-01	1.33E+00	1.75E-04	3.58E-06	4.61E-06	2.22E-06	1.84E-04	1.24E-03	5.66E-05	1.91E-06	6.61E-04	
Thorium (90)	Th-228	3.63E-01	1.91E+00	2.44E-03	7.99E-03	4.59E-06	1.59E-06	2.05E-06	9.88E-07	1.78E-04	8.67E-04	3.02E-05	2.56E-06	6.22E-04	
Thorium (90)	Th-229	9.44E-05	7.34E+03	5.56E-04	5.50E-03	2.52E-07	1.00E-06	1.29E-06	6.23E-07	1.05E-04	8.47E-04	1.64E-05	3.84E-06	3.49E-03	
Thorium (90)	Th-230	9.19E-06	7.54E+04	7.26E-05	8.16E-04	2.21E-07	2.47E-06	3.18E-06	1.53E-06	1.85E-05	1.38E-04	2.13E-05	1.16E-06	2.16E-04	
Thorium (90)	Th-231	2.38E+02	2.91E-03	2.80E+03	1.52E+03	3.67E+00	7.94E-07	1.02E-06	4.94E-07	8.53E-05	6.25E-04	5.07E-05	1.91E-06	6.60E-04	
Thorium (90)	Th-232	4.93E-11	1.41E+10	6.30E-05	5.65E-04	6.87E-08	9.93E-07	1.28E-06	6.17E-07	3.80E-05	2.50E-04	1.35E-05	3.86E-07	1.61E-04	
Thorium (90)	Th-233	1.63E+04	4.24E-05	1.93E+03	3.29E+03	5.89E+02	8.92E-07	1.15E-06	5.54E-07	9.15E-05	7.36E-04	1.60E-05	1.89E-06	3.49E-03	
Thorium (90)	Th-234	1.05E+01	6.60E-02	5.97E+00	1.42E+01	1.24E-03	1.90E-06	2.44E-06	1.18E-06	1.79E-05	1.34E-04	1.81E-05	8.85E-07	2.16E-04	
Thorium (90)	Th-235	5.13E+04	1.35E-05	1.18E+10	1.41E+11	8.88E+06	7.31E-07	9.41E-07	4.54E-07	7.70E-05	5.69E-04	4.74E-05	1.27E-06	4.52E-04	
Thorium (90)	Th-236	9.71E+03	7.13E-05	1.41E+09	1.12E+11	1.25E+05	8.94E-07	1.15E-06	5.55E-07	3.63E-05	2.41E-04	1.32E-05	3.52E-07	1.61E-04	
Titanium (22)	Ti-44	1.16E-02	6.00E+01	4.81E-04	7.32E-04	1.32E-04	6.64E-04	8.57E-04	4.13E-04	1.95E-03	1.64E-02	9.53E-04	1.70E-02	.	
Titanium (22)	Ti-45	1.97E+03	3.52E-04	4.24E+12	5.76E+12	2.12E+13	2.64E-01	6.24E-01	1.69E-01	8.08E-02	6.83E-01	8.22E-02	6.83E-01	.	
Titanium (22)	Ti-51	6.32E+04	1.10E-05	2.95E+22	4.01E+22	1.51E+23	9.56E-01	4.17E+00	6.21E-01	.	1.58E+04	1.01E+04	1.58E+04	.	
Titanium (22)	Ti-52	2.14E+05	3.23E-06	2.93E+22	3.98E+22	1.49E+23	2.09E-01	9.12E-01	1.36E-01	.	3.47E+03	2.21E+03	1.09E+03	.	
Thallium (81)	Tl-190	1.40E+05	4.95E-06	9.36E+13	1.68E+16	5.65E+13	8.51E-06	1.10E-05	5.29E-06	5.12E-04	3.13E-03	1.76E-03	1.91E-04	.	
Thallium (81)	Tl-190m	9.84E+04	7.04E-06	6.57E+13	1.15E+16	3.97E+13	8.51E-06	1.10E-05	5.29E-06	5.12E-04	3.13E-03	1.76E-03	1.91E-04	.	
Thallium (81)	Tl-194	1.10E+04	6.28E-05	4.72E+03	9.68E+03	1.67E+03	3.01E-03	3.92E-03	1.87E-03	1.18E-02	4.14E-02	5.65E-04	2.89E-01	.	
Thallium (81)	Tl-194m	1.11E+04	6.24E-05	4.75E+03	9.74E+03	1.68E+03	2.96E-03	3.90E-03	1.85E-03	1.18E-02	4.14E-02	5.65E-04	2.89E-01	.	
Thallium (81)	Tl-195	5.23E+03	1.32E-04	4.84E+02	9.89E+02	2.59E+02	1.80E-02	2.46E-02	1.12E-02	2.40E-02	1.29E-01	1.80E-03	1.18E+00	.	
Thallium (81)	Tl-196	3.30E+03	2.10E-04	8.46E+12	1.15E+13	4.31E+13	1.70E-01	6.63E-01	1.10E-01	4.77E-01	3.98E+00	1.27E-01	5.97E+00	.	
Thallium (81)	Tl-197	2.14E+03	3.24E-04	2.24E+02	2.85E+03	1.38E+02	1.44E-02	1.88E-02	8.94E-03	3.25E-02	8.74E-02	1.18E-03	5.30E-01	2.10E+02	
Thallium (81)	Tl-198	1.15E+03	6.05E-04	7.00E+09	9.52E+09	3.56E+10	1.52E-01	5.56E-01	9.85E-02	2.72E-01	2.27E+00	7.26E-02	3.40E+00	.	
Thallium (81)	Tl-198m	3.25E+03	2.13E-04	2.78E+10	3.79E+10	1.42E+11	1.43E-01	4.86E-01	9.25E-02	2.48E-01	2.07E+00	6.61E-02	3.11E+00	.	
Thallium (81)	Tl-199	8.18E+02	8.47E-04	1.66E+10	9.19E+09	1.06E+11	8.40E-01	1.74E+00	5.35E-01	7.24E-01	6.06E+00	1.93E-01	9.09E+00	.	
Thallium (81)	Tl-200	2.33E+02	2.98E-03	4.37E+00	6.36E+00	2.22E+00	1.79E-01	4.44E-01	1.15E-01	9.13E-02	7.60E-01	2.43E-02	1.14E+00	5.55E+01	
Thallium (81)	Tl-201	8.33E+01	8.32E-03	4.91E+01	7.18E+01	2.12E+01	3.10E-01	4.18E-01	1.93E-01	1.47E-01	1.24E+00	3.93E-02	1.86E+00	5.00E+01	
Thallium (81)	Tl-202	2.07E+01	3.35E-02	1.25E+00	1.83E+00	5.99E-01	1.39E-01	2.05E-01	8.73E-02	3.74E-02	3.13E-01	9.96E-03	4.69E-01	1.67E+01	
Thallium (81)	Tl-204	1.83E-01	3.78E+00	1.10E+00	9.00E+00	1.76E-02	3.81E-03	4.91E-03	2.37E-03	9.17E-03	7.74E-02	2.44E-03	1.16E-01	1.67E+01	
Thallium (81)	Tl-206	8.67E+04	7.99E-06	4.66E+24	6.32E+24	2.37E+25	1.58E+02	6.90E+02	1.03E+02	.	3.61E+06	2.30E+06	5.41E+06	.	
Thallium (81)	Tl-206m	9.74E+04	7.12E-06	1.67E+22	2.26E+22	8.49E+22	1.45E-01	6.34E-01	9.43E-02	.	2.39E+03	1.52E+03	3.59E+03	.	
Thallium (81)	Tl-207	7.64E+04	9.08E-06	1.66E+24	2.25E+24	8.44E+24	8.20E+01	3.58E+02	5.33E+01	.	1.56E+06	9.92E+05	2.34E+06	.	
Thallium (81)	Tl-208	1.19E+05	5.81E-06	1.76E+22	2.39E+22	8.97E+22	9.35E-02	4.08E-01	6.07E-02	.	1.54E+03	9.79E+02	2.30E+03	.	
Thallium (81)	Tl-209	1.69E+05	4.11E-06	1.70E+16	4.23E+17	5.30E+16	1.36E-01	4.59E-01	8.79E-02	2.16E-01	1.63E+00	5.04E-01	2.46E-01	.	
Thallium (81)	Tl-210	2.80E+05	2.47E-06	1.46E+03	3.71E+05	1.57E+02	7.45E-06	9.60E-06	4.63E-06	2.19E-05	1.72E-04	5.77E-05	3.17E-05	8.11E-02	
Thulium (69)	Tm-161	1.21E+04	5.75E-05	2.59E+12	3.52E+12	1.32E+13	1.31E-01	4.37E-01	8.48E-02	1.10E-01	9.21E-01	4.03E-01	5.05E-01	.	
Thulium (69)	Tm-162	1.68E+04	4.13E-05	1.51E+17	2.06E+17	7.72E+17	1.68E-01	6.91E-01	1.09E-01	7.29E-01	6.04E+00	3.67E+00	2.00E+00	.	
Thulium (69)	Tm-163	3.35E+03	2.07E-04	8.62E+08	1.60E+11	2.07E+08	1.05E-01	1.91E-01	6.68E-02	2.75E-01	2.29E+00	1.31E+00	8.23E-01	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident Soil Total PRG TR=1E-06 (Bq/g)	Composite Worker Soil Total PRG TR=1E-06 (Bq/g)	Farmer Soil Total PRG TR=1E-06 (Bq/g)	Resident Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Composite Worker Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Farmer Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Resident Finfish PRG TR=1E-06 (Bq/g)	Resident Tap Water PRG TR=1E-06 (Bq/L)	Farmer Tap Water Total PRG TR=1E-06 (Bq/L)	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
Thulium (69)	Tm-164	1.82E+05	3.81E-06	8.16E+23	1.11E+24	4.16E+24	4.48E-01	1.95E+00	2.91E-01	.	7.38E+03	4.70E+03	2.44E+03	.	
Thulium (69)	Tm-165	2.02E+02	3.43E-03	1.00E+01	1.46E+01	5.15E+00	1.81E-01	2.90E-01	1.14E-01	2.97E-02	2.49E-01	1.48E-01	8.44E-02	.	
Thulium (69)	Tm-166	7.88E+02	8.79E-04	3.61E+09	5.89E+08	6.86E+10	1.21E-01	3.16E-01	7.78E-02	4.86E-02	4.06E-01	2.47E-01	1.34E-01	.	
Thulium (69)	Tm-167	2.73E+01	2.53E-02	7.17E+00	1.10E+01	3.70E+00	4.43E-02	5.77E-02	2.76E-02	1.43E-02	1.21E-01	7.33E-02	3.98E-02	.	
Thulium (69)	Tm-168	2.72E+00	2.55E-01	5.63E-02	8.23E-02	2.90E-02	1.19E-02	1.58E-02	7.42E-03	1.17E-02	9.80E-02	5.96E-02	3.24E-02	.	
Thulium (69)	Tm-170	1.97E+00	3.52E-01	3.52E+00	3.81E+01	1.96E+00	7.02E-03	9.04E-03	4.36E-03	5.81E-03	4.89E-02	2.97E-02	1.62E-02	1.22E+00	
Thulium (69)	Tm-171	3.61E-01	1.92E+00	8.13E+00	8.40E+01	4.52E+00	5.31E-02	6.84E-02	3.30E-02	7.37E-02	6.21E-01	3.77E-01	2.05E-01	1.22E+01	
Thulium (69)	Tm-172	9.55E+01	7.26E-03	4.43E+00	6.62E+00	2.28E+00	3.59E-02	4.80E-02	2.24E-02	4.75E-03	4.00E-02	2.43E-02	1.32E-02	.	
Thulium (69)	Tm-173	7.37E+02	9.41E-04	4.37E+10	1.10E+09	1.58E+10	2.17E-01	3.35E-01	1.36E-01	3.06E-02	2.58E-01	1.57E-01	8.51E-02	.	
Thulium (69)	Tm-174	6.75E+04	1.03E-05	8.90E+20	1.21E+21	4.54E+21	1.98E-01	8.63E-01	1.28E-01	.	3.25E+03	2.07E+03	1.07E+03	.	
Thulium (69)	Tm-175	2.40E+04	2.89E-05	1.57E+04	2.55E+04	8.15E+03	6.15E-02	9.20E-02	3.85E-02	1.74E-02	1.47E-01	8.91E-02	9.38E-02	.	
Thulium (69)	Tm-176	1.97E+05	3.52E-06	3.53E+24	4.72E+24	1.80E+25	1.69E-01	7.36E-01	1.10E-01	.	2.77E+03	1.77E+03	9.16E+02	.	
Uranium (92)	U-227	3.31E+05	2.09E-06	1.33E+26	1.78E+26	6.79E+26	1.05E+00	4.59E+00	6.83E-01	.	1.71E+04	1.09E+04	1.83E+01	6.66E-04	
Uranium (92)	U-228	4.00E+04	1.73E-05	1.64E+22	2.23E+22	8.37E+22	1.23E+01	5.37E+01	7.99E+00	.	2.00E+05	1.27E+05	5.47E+02	1.20E-01	
Uranium (92)	U-230	1.22E+01	5.70E-02	5.49E-02	9.77E+00	5.54E-05	2.68E-06	3.45E-06	1.67E-06	2.01E-05	1.59E-04	4.58E-05	1.18E-06	4.79E-02	
Uranium (92)	U-231	6.02E+01	1.15E-02	3.27E+01	5.87E+01	2.61E-02	7.94E-07	1.02E-06	4.94E-07	8.53E-05	6.25E-04	5.23E-05	1.88E-06	6.60E-04	
Uranium (92)	U-232	1.01E-02	6.89E+01	2.43E-04	1.04E-03	8.54E-08	9.70E-07	1.25E-06	6.03E-07	9.32E-05	5.56E-04	2.59E-05	6.83E-07	6.22E-04	
Uranium (92)	U-233	4.35E-06	1.59E+05	5.65E-04	6.34E-03	1.70E-07	8.92E-07	1.15E-06	5.54E-07	9.25E-05	7.45E-04	1.60E-05	1.89E-06	3.49E-03	
Uranium (92)	U-234	2.82E-06	2.46E+05	1.11E-04	1.27E-03	2.13E-07	1.90E-06	2.45E-06	1.18E-06	1.80E-05	1.35E-04	2.07E-05	8.88E-07	2.16E-04	
Uranium (92)	U-235	9.84E-10	7.04E+08	2.27E-04	2.71E-03	1.70E-07	7.31E-07	9.41E-07	4.54E-07	7.71E-05	5.69E-04	4.74E-05	1.27E-06	4.52E-04	
Uranium (92)	U-235m	1.40E+04	4.95E-05	3.23E+09	3.85E+10	2.43E+06	7.31E-07	9.41E-07	4.54E-07	7.71E-05	5.69E-04	4.74E-05	1.27E-06	4.52E-04	
Uranium (92)	U-236	2.96E-08	2.34E+07	4.28E-03	3.42E-01	3.81E-07	8.94E-07	1.15E-06	5.55E-07	3.63E-05	2.41E-04	1.32E-05	3.52E-07	1.61E-04	
Uranium (92)	U-237	3.75E+01	1.85E-02	9.19E+00	1.63E+01	6.92E-03	8.02E-07	1.03E-06	4.99E-07	8.25E-05	6.62E-04	8.57E-06	1.11E-06	2.09E-04	
Uranium (92)	U-238	1.55E-10	4.47E+09	6.46E-05	7.40E-04	9.46E-08	1.59E-06	2.05E-06	9.87E-07	1.75E-05	1.32E-04	1.77E-05	7.30E-07	1.10E-04	
Uranium (92)	U-239	1.55E+04	4.46E-05	2.52E+03	4.40E+03	2.50E-02	6.21E-07	8.00E-07	3.86E-07	6.50E-05	4.88E-04	3.27E-06	1.15E-06	3.59E-04	
Uranium (92)	U-240	4.31E+02	1.61E-03	3.02E+01	4.74E+01	7.32E-02	7.35E-07	9.47E-07	4.57E-07	3.34E-05	2.25E-04	2.81E-06	3.43E-07	1.52E-04	
Uranium (92)	U-242	2.17E+04	3.20E-05	2.03E+08	5.48E+09	2.21E+02	1.17E-06	1.50E-06	7.24E-07	1.69E-05	1.27E-04	3.10E-06	7.04E-07	1.06E-04	
Vanadium (23)	V-47	1.12E+04	6.20E-05	1.93E+16	2.63E+16	9.80E+16	3.25E-01	1.17E+00	2.10E-01	4.32E-01	3.39E+00	1.66E-01	1.02E+00	.	
Vanadium (23)	V-48	1.58E+01	4.38E-02	1.24E-01	1.83E-01	5.70E-02	1.84E-02	2.68E-02	1.15E-02	6.38E-03	5.04E-02	2.46E-03	1.51E-02	1.00E+00	
Vanadium (23)	V-49	7.67E-01	9.04E-01	3.13E+01	2.29E+04	1.55E+00	8.19E-01	1.06E+00	5.09E-01	4.25E-01	3.37E+00	1.64E-01	1.01E+00	.	
Vanadium (23)	V-50	4.62E-18	1.50E+17	5.83E-04	8.98E-04	1.69E-04	2.39E-03	3.10E-03	1.49E-03	9.47E-03	7.38E-02	3.64E-03	2.21E-02	.	
Vanadium (23)	V-52	9.73E+04	7.12E-06	2.39E+22	3.25E+22	1.22E+23	2.24E-01	9.79E-01	1.46E-01	.	3.73E+03	2.37E+03	1.12E+03	.	
Vanadium (23)	V-53	2.26E+05	3.06E-06	2.07E+24	2.76E+24	1.05E+25	3.23E-01	1.41E+00	2.10E-01	.	5.34E+03	3.40E+03	1.60E+03	.	
Tungsten (74)	W-177	2.76E+03	2.51E-04	2.46E+04	3.68E+03	1.20E+03	1.95E-01	3.95E-01	1.24E-01	6.59E-02	2.30E-01	3.47E-02	4.63E-02	.	
Tungsten (74)	W-178	1.17E+01	5.92E-02	4.93E-01	4.68E+00	2.07E-01	7.25E-02	9.49E-02	4.51E-02	3.78E-02	4.59E-02	6.21E-03	6.90E-03	.	
Tungsten (74)	W-179	9.83E+03	7.05E-05	3.65E+04	5.68E+04	1.67E+04	1.27E-01	1.65E-01	7.88E-02	1.57E-01	1.16E+00	2.21E-01	5.79E-01	.	
Tungsten (74)	W-179m	5.69E+04	1.22E-05	2.11E+05	3.29E+05	9.70E+04	1.25E-01	1.64E-01	7.77E-02	1.57E-01	1.16E+00	2.21E-01	5.80E-01	.	
Tungsten (74)	W-181	2.09E+00	3.32E-01	2.98E-01	7.06E+00	1.23E-01	2.00E-01	2.60E-01	1.25E-01	1.16E-01	1.41E-01	1.90E-02	2.11E-02	5.56E+00	
Tungsten (74)	W-185	3.37E+00	2.06E-01	7.78E-02	1.32E+03	3.16E-02	1.68E-02	2.17E-02	1.05E-02	1.75E-02	2.13E-02	2.89E-03	3.21E-03	1.67E+00	
Tungsten (74)	W-185m	2.28E+05	3.04E-06	5.27E+03	8.92E+07	2.14E+03	1.68E-02	2.17E-02	1.05E-02	1.75E-02	2.13E-02	2.89E-03	3.21E-03	1.67E+00	
Tungsten (74)	W-187	2.56E+02	2.71E-03	3.75E+00	2.17E+01	1.61E+00	9.82E-02	1.38E-01	6.14E-02	1.48E-02	1.80E-02	2.44E-03	2.63E-03	7.75E-01	
Tungsten (74)	W-188	3.62E+00	1.91E-01	1.60E-02	2.26E+00	6.74E-03	3.95E-03	5.09E-03	2.46E-03	2.74E-03	3.99E-03	5.90E-04	1.97E-04	5.70E-02	
Tungsten (74)	W-190	1.21E+04	5.71E-05	4.63E+16	6.51E+16	2.33E+17	2.11E-01	7.00E-01	1.36E-01	3.29E-01	3.99E-01	5.41E-02	5.99E-02	.	
Xenon (54)	Xe-120	9.11E+03	7.61E-05	2.28E+13	3.11E+13	1.16E+14	7.55E-02	1.89E-01	4.84E-02	7.09E-02	4.40E-01	1.43E-01	8.80E-05	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)										Protection of Groundwater (DAF = 1)	
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident	Composite Worker	Farmer	Resident	Composite Worker	Farmer	Resident	Resident	Farmer	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
				Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Soil Total PRG TR=1E-06 (Bq/g)	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Finfish PRG TR=1E-06 (Bq/g)	Tap Water PRG TR=1E-06 (Bq/L)	Tap Water PRG TR=1E-06 (Bq/L)			
Xenon (54)	Xe-121	9.08E+03	7.63E-05	3.36E+02	5.97E+02	1.81E+02	5.88E-02	1.07E-01	3.72E-02	3.16E-02	1.21E-01	3.21E-02	3.30E-04	.	
Xenon (54)	Xe-122	3.02E+02	2.29E-03	7.59E+00	1.10E+01	3.90E+00	3.49E-01	1.52E+00	2.27E-01	.	5.75E+03	3.66E+03	1.21E+00	.	
Xenon (54)	Xe-123	2.92E+03	2.37E-04	5.57E+02	9.21E+02	2.43E+06	5.20E-02	7.29E-02	3.25E-02	3.25E-02	1.42E-01	3.99E-02	9.35E-05	.	
Xenon (54)	Xe-125	3.59E+02	1.93E-03	1.20E+01	6.16E+01	5.80E+00	8.21E-03	1.06E-02	5.11E-03	2.18E-03	1.35E-02	4.39E-03	2.69E-06	.	
Xenon (54)	Xe-127	6.95E+00	9.97E-02	8.13E-01	1.18E+00	4.18E-01	1.43E+00	6.25E+00	9.30E-01	.	2.33E+04	1.49E+04	.	.	
Xenon (54)	Xe-127m	3.16E+05	2.19E-06	3.70E+04	5.38E+04	1.90E+04	9.09E-01	3.97E+00	5.91E-01	.	1.48E+04	9.40E+03	.	.	
Xenon (54)	Xe-129m	2.85E+01	2.43E-02	7.46E+01	1.09E+02	3.84E+01	2.05E+01	8.97E+01	1.33E+01	.	3.25E+05	2.07E+05	.	.	
Xenon (54)	Xe-131m	2.14E+01	3.24E-02	1.64E+02	2.39E+02	8.45E+01	5.57E+01	2.43E+02	3.62E+01	.	8.85E+05	5.64E+05	.	.	
Xenon (54)	Xe-133	4.82E+01	1.44E-02	7.97E+01	1.16E+02	4.10E+01	1.27E+01	5.55E+01	8.26E+00	.	2.00E+05	1.28E+05	.	.	
Xenon (54)	Xe-133m	1.16E+02	6.00E-03	8.04E+01	1.17E+02	4.14E+01	6.57E+00	2.87E+01	4.27E+00	.	1.05E+05	6.71E+04	.	.	
Xenon (54)	Xe-135	6.64E+02	1.04E-03	3.32E+07	2.23E+08	2.13E+04	6.80E-03	8.79E-03	4.23E-03	9.64E-03	6.75E-02	9.44E-04	6.88E-04	3.40E-01	
Xenon (54)	Xe-135m	2.38E+04	2.91E-05	1.19E+09	7.82E+09	7.63E+05	6.75E-03	8.77E-03	4.20E-03	9.64E-03	6.75E-02	9.44E-04	6.88E-04	3.40E-01	
Xenon (54)	Xe-137	9.54E+04	7.26E-06	6.16E+03	1.39E+04	1.28E+01	2.03E-03	2.63E-03	1.26E-03	2.01E-03	1.41E-02	1.97E-04	1.43E-04	7.55E-02	
Xenon (54)	Xe-138	2.59E+04	2.68E-05	8.86E+15	1.20E+16	3.32E+16	8.95E-02	3.60E-01	5.81E-02	3.32E-01	2.37E+00	3.25E-02	2.42E-02	.	
Yttrium (39)	Y-81	3.10E+05	2.23E-06	1.34E+11	2.03E+11	4.51E+10	1.00E-01	3.53E-01	6.50E-02	2.11E-01	5.88E-01	1.45E-02	1.10E-03	.	
Yttrium (39)	Y-83	5.14E+04	1.35E-05	6.14E+02	1.43E+03	2.50E+01	2.74E-02	4.12E-02	1.72E-02	7.22E-03	2.19E-02	3.43E-04	6.48E-05	.	
Yttrium (39)	Y-83m	1.28E+05	5.42E-06	1.53E+03	3.56E+03	6.21E+01	2.73E-02	4.12E-02	1.71E-02	7.22E-03	2.19E-02	3.43E-04	6.48E-05	.	
Yttrium (39)	Y-84m	9.22E+03	7.52E-05	1.58E+15	2.15E+15	8.05E+15	8.20E-02	3.23E-01	5.32E-02	1.79E-01	1.44E+00	4.94E-01	6.78E-02	.	
Yttrium (39)	Y-85	2.27E+03	3.06E-04	8.13E+01	1.97E+02	1.78E+00	5.50E-02	8.71E-02	3.46E-02	2.02E-02	6.11E-02	1.27E-02	8.18E-05	4.39E-02	
Yttrium (39)	Y-85m	1.25E+03	5.55E-04	3.90E+01	9.47E+01	8.54E-01	4.54E-02	7.04E-02	2.85E-02	1.33E-02	4.78E-02	1.04E-02	7.16E-05	4.01E-02	
Yttrium (39)	Y-86	4.12E+02	1.68E-03	2.64E+00	3.86E+00	2.75E+06	5.74E-02	1.30E-01	3.66E-02	1.33E-02	1.08E-01	3.70E-02	5.08E-03	.	
Yttrium (39)	Y-86m	7.59E+03	9.13E-05	4.91E+01	7.17E+01	4.82E+07	5.46E-02	1.24E-01	3.49E-02	1.27E-02	1.02E-01	3.52E-02	4.84E-03	.	
Yttrium (39)	Y-87	7.61E+01	9.11E-03	2.54E+00	3.83E+00	5.74E-01	1.06E-01	1.63E-01	6.68E-02	1.95E-02	1.43E-01	3.26E-02	1.21E-03	7.78E+02	
Yttrium (39)	Y-87m	4.54E+02	1.53E-03	1.11E+01	1.66E+01	3.48E+00	7.97E-02	1.23E-01	5.00E-02	1.39E-02	1.05E-01	2.64E-02	1.15E-03	7.90E+02	
Yttrium (39)	Y-88	2.37E+00	2.92E-01	1.92E-02	2.81E-02	9.65E-03	1.03E-02	1.41E-02	6.43E-03	1.28E-02	1.03E-01	3.55E-02	4.87E-03	.	
Yttrium (39)	Y-89m	1.40E+06	4.97E-07	1.86E+29	2.48E+29	9.47E+29	3.78E-01	1.65E+00	2.46E-01	.	6.26E+03	3.98E+03	2.95E+02	.	
Yttrium (39)	Y-90	9.47E+01	7.32E-03	3.56E+01	7.74E+02	2.90E+00	2.74E-02	3.52E-02	1.70E-02	2.85E-03	2.32E-02	7.94E-03	1.09E-03	1.05E-01	
Yttrium (39)	Y-90m	1.90E+03	3.64E-04	7.15E+02	1.56E+04	5.84E+01	2.47E-02	3.29E-02	1.54E-02	2.69E-03	2.19E-02	7.51E-03	1.03E-03	1.05E-01	
Yttrium (39)	Y-91	4.32E+00	1.60E-01	1.78E+00	2.98E+01	1.48E-01	6.84E-03	8.81E-03	4.25E-03	3.19E-03	2.60E-02	8.91E-03	1.23E-03	1.57E-01	
Yttrium (39)	Y-91m	7.33E+03	9.46E-05	3.02E+03	5.06E+04	2.51E+02	6.76E-03	8.78E-03	4.21E-03	3.19E-03	2.60E-02	8.89E-03	1.23E-03	1.56E-01	
Yttrium (39)	Y-92	1.71E+03	4.04E-04	6.63E+11	9.27E+11	2.90E+12	2.07E-01	3.00E-01	1.29E-01	2.08E-02	1.69E-01	5.79E-02	7.98E-03	3.49E-01	
Yttrium (39)	Y-93	5.96E+02	1.16E-03	8.71E+07	6.67E+07	5.18E+07	9.90E-03	1.28E-02	6.15E-03	5.70E-03	4.63E-02	1.29E-02	2.67E-03	1.56E-01	
Yttrium (39)	Y-94	1.95E+04	3.56E-05	2.53E+18	3.44E+18	1.28E+19	3.85E-01	1.37E+00	2.49E-01	3.88E-01	3.12E+00	1.07E+00	1.47E-01	.	
Yttrium (39)	Y-95	3.54E+04	1.96E-05	5.65E+02	8.32E+02	2.89E+02	7.78E-03	1.05E-02	4.85E-03	7.30E-03	6.00E-02	1.10E-02	3.04E-02	2.57E+00	
Ytterbium (70)	Yb-162	1.93E+04	3.59E-05	2.90E+16	3.94E+16	1.48E+17	1.49E-01	5.82E-01	9.63E-02	3.76E-01	3.12E+00	1.90E+00	1.35E+00	.	
Ytterbium (70)	Yb-163	3.30E+04	2.10E-05	8.47E+09	1.57E+12	2.04E+09	8.61E-02	1.73E-01	5.47E-02	2.33E-01	1.94E+00	1.12E+00	7.48E-01	.	
Ytterbium (70)	Yb-164	4.81E+03	1.44E-04	2.48E+14	3.37E+14	1.26E+15	3.47E-01	1.04E+00	2.23E-01	1.92E-01	1.61E+00	9.77E-01	1.04E+00	.	
Ytterbium (70)	Yb-165	3.68E+04	1.88E-05	1.81E+03	2.65E+03	9.33E+02	1.56E-01	2.74E-01	9.88E-02	2.97E-02	2.49E-01	1.48E-01	8.43E-02	.	
Ytterbium (70)	Yb-166	1.07E+02	6.47E-03	1.24E+00	1.81E+00	6.36E-01	4.81E-02	7.81E-02	3.03E-02	9.84E-03	8.23E-02	5.01E-02	4.47E-02	.	
Ytterbium (70)	Yb-167	2.08E+04	3.33E-05	5.45E+03	8.36E+03	2.82E+03	4.31E-02	5.71E-02	2.68E-02	1.43E-02	1.20E-01	7.30E-02	3.97E-02	.	
Ytterbium (70)	Yb-169	7.90E+00	8.77E-02	1.06E+00	1.59E+00	5.45E-01	1.82E-02	2.37E-02	1.13E-02	1.11E-02	9.28E-02	5.64E-02	6.04E-02	.	
Ytterbium (70)	Yb-175	6.04E+01	1.15E-02	3.97E+01	6.45E+01	2.06E+01	7.69E-02	9.96E-02	4.78E-02	1.77E-02	1.49E-01	9.06E-02	9.69E-02	.	
Ytterbium (70)	Yb-177	3.18E+03	2.18E-04	2.77E+03	4.52E+03	7.71E+02	4.58E-02	6.03E-02	2.85E-02	1.32E-02	1.12E-01	2.42E-03	3.52E-01	5.66E+01	
Ytterbium (70)	Yb-178	4.92E+03	1.41E-04	2.39E+15	3.26E+15	1.22E+16	5.76E-01	9.26E-01	3.63E-01	1.13E-01	9.45E-01	9.30E-02	7.25E-01	.	

Summary PRGs February 2023															
Radionuclide		Isotope-specific		Preliminary Remediation Goals (PRGs)									Protection of Groundwater (DAF = 1)		
Element (Atomic Number)	Isotope	Lambda (1/yr)	Half-life (yr)	Resident Soil Total PRG TR=1E-06 (Bq/g)	Composite Worker Soil Total PRG TR=1E-06 (Bq/g)	Farmer Soil Total PRG TR=1E-06 (Bq/g)	Resident Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Composite Worker Air Total PRG (no decay) TR=1E-06 (Bq/m <sup>3</sup> )	Farmer Air Total (no decay) PRG TR=1E-06 (Bq/m <sup>3</sup> )	Resident Finfish PRG TR=1E-06 (Bq/g)	Resident Tap Water PRG TR=1E-06 (Bq/L)	Farmer Tap Water PRG TR=1E-06 (Bq/L)	SSL Risk-based TR=1E-06 (Bq/g)	SSL MCL-based (Bq/g)	
Ytterbium (70)	Yb-179	4.55E+04	1.52E-05	6.54E+13	9.22E+13	2.56E+14	1.94E-01	4.08E-01	1.23E-01	4.37E-02	3.70E-01	7.31E-03	1.89E+00	.	
Zinc (30)	Zn-60	1.53E+05	4.53E-06	7.79E+17	1.06E+18	3.97E+18	6.05E-02	2.55E-01	3.93E-02	3.90E-01	2.39E+00	2.78E-01	1.27E+00	.	
Zinc (30)	Zn-61	2.45E+05	2.83E-06	4.45E+13	6.11E+13	2.23E+14	1.27E-01	4.24E-01	8.22E-02	1.16E-01	7.20E-01	8.32E-02	3.82E-01	.	
Zinc (30)	Zn-62	6.61E+02	1.05E-03	3.83E+07	3.11E+07	8.88E+08	5.97E-02	9.27E-02	3.75E-02	1.04E-02	1.13E-02	6.77E-04	1.07E-02	.	
Zinc (30)	Zn-63	9.47E+03	7.32E-05	9.20E+15	1.32E+16	4.58E+16	2.88E-01	1.01E+00	1.87E-01	3.29E-01	3.56E-01	2.14E-02	3.38E-01	.	
Zinc (30)	Zn-65	1.04E+00	6.69E-01	5.13E-03	5.99E-02	1.93E-03	2.89E-02	3.86E-02	1.80E-02	4.92E-03	5.30E-03	3.19E-04	5.04E-03	1.05E+01	
Zinc (30)	Zn-69	6.46E+03	1.07E-04	5.92E+16	6.32E+18	2.13E+17	3.50E+00	4.53E+00	2.17E+00	7.40E-01	8.00E-01	4.80E-02	7.60E-01	2.11E+02	
Zinc (30)	Zn-69m	4.41E+02	1.57E-03	9.08E+00	4.05E+01	2.91E+07	1.31E-01	1.88E-01	8.17E-02	2.65E-02	2.87E-02	1.72E-03	2.73E-02	6.80E+00	
Zinc (30)	Zn-71	1.49E+05	4.66E-06	7.15E+23	9.63E+23	3.64E+24	1.09E+00	4.75E+00	7.06E-01	.	1.80E+04	1.14E+04	1.71E+04	.	
Zinc (30)	Zn-71m	1.53E+03	4.52E-04	1.15E+11	1.96E+11	5.36E+11	1.43E-01	3.35E-01	9.17E-02	5.37E-02	5.80E-02	3.49E-03	5.52E-02	.	
Zinc (30)	Zn-72	1.31E+02	5.31E-03	5.53E-01	1.51E+00	2.31E-01	2.20E-02	3.27E-02	1.38E-02	4.25E-03	7.69E-03	4.66E-04	6.02E-03	1.11E+00	
Zirconium (40)	Zr-85	4.63E+04	1.50E-05	1.45E+03	3.52E+03	3.17E+01	3.83E-02	6.63E-02	2.42E-02	1.35E-02	4.81E-02	1.04E-02	7.19E-05	4.02E-02	
Zirconium (40)	Zr-86	3.68E+02	1.88E-03	2.22E+00	3.25E+00	1.12E+00	3.96E-02	7.51E-02	2.51E-02	6.76E-03	5.57E-02	2.11E-02	4.59E-03	.	
Zirconium (40)	Zr-87	3.61E+03	1.92E-04	8.81E+01	1.32E+02	2.77E+01	6.07E-02	1.03E-01	3.83E-02	1.18E-02	9.08E-02	2.41E-02	1.15E-03	7.90E+02	
Zirconium (40)	Zr-88	3.03E+00	2.28E-01	2.20E-02	3.22E-02	1.11E-02	6.39E-03	8.59E-03	3.98E-03	9.37E-03	7.62E-02	2.76E-02	4.68E-03	.	
Zirconium (40)	Zr-89	7.74E+01	8.95E-03	1.60E+00	2.34E+00	8.23E-01	8.17E-02	1.30E-01	5.14E-02	1.45E-02	1.22E-01	5.17E-02	5.01E-02	.	
Zirconium (40)	Zr-89m	8.75E+04	7.92E-06	1.93E+03	2.82E+03	9.91E+02	7.52E-02	1.31E-01	4.75E-02	1.55E-02	1.30E-01	5.51E-02	5.34E-02	.	
Zirconium (40)	Zr-93	4.53E-07	1.53E+06	1.81E-01	3.64E+01	3.94E-02	1.12E-02	1.44E-02	6.97E-03	2.90E-02	2.34E-01	3.68E-02	1.45E-01	1.98E+01	
Zirconium (40)	Zr-95	3.95E+00	1.75E-01	6.31E-02	9.29E-02	3.23E-02	8.02E-03	1.06E-02	4.99E-03	7.37E-03	6.05E-02	1.11E-02	3.37E-02	2.57E+00	
Zirconium (40)	Zr-97	3.63E+02	1.91E-03	5.64E+00	8.29E+00	2.88E+00	3.68E-02	5.36E-02	2.30E-02	4.06E-03	3.42E-02	1.37E-02	1.42E-02	9.06E-01	