

RAP-9
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Table 8-3. Summary of 100-K Operable Unit Human Health, Groundwater Protection, Surface Water Protection, and Ecological Soil PRGs

Analyte Name	CAS No.	Units	Hanford Site Background Concentration ^a	Human Health PRGs						PRGs Protective of Groundwater and Surface Water						Ecological PRGs			
				RI/FS Soil MTCA B— Direct Contact PRG ^b	RI/FS Residential PRG ^c	RI/FS Soil Method B Inhalation PRG ^d	RI/FS Casual Recreational User— Direct Contact PRG ^{e,f}	RI/FS Resident Monument Worker— Direct Contact PRG ^e	DOE/RL 96-17 Residential RAG ^h	with irrigation 100:0 Contaminant Source Model GWP SSL ⁱ	without irrigation 100:0 Contaminant Source Model GWP PRG ⁱ	MTCA 100X DOE/RL 96-17 GWP RAG ^b	No GW → river dilution 100:0 Contaminant Source Model SWP SSL ⁱ	1:1 dilution 100:0 Contaminant Source Model SWP PRG ⁱ	DOE/RL 96-17 SWP RAG ^b	Plant PRG ^j	Invertebrate PRG ^j	Avian PRG ^j	Mammal PRG ^j
Radionuclides																			
Americium-241	14596-10-2	pCi/g	--	--	155	--	2,570	275	3.1	1,212	9,990	--	1,212	9,990	--	21,500	--	11,900	4,840
Carbon-14	14762-75-5	pCi/g	--	--	81	--	327,610	52,046	8.7	43	80	--	43	80	--	60,700	--	50	32
Cesium-137	10045-97-3	pCi/g	1.1	--	4.4	--	100	6.2	6.2	59,822	143,128	1,465	59,822	143,128	2,930	2,210	--	1,430	924
Cobalt-60	10198-40-0	pCi/g	0.0084	--	3.1	--	63	3.3	1.4	177,686	198,457	13,900	177,686	198,457	27,800	6,130	--	805	805
Europium-152	14683-23-9	pCi/g	--	--	3.7	--	66	3.8	3.3	16,154	133,202	--	16,154	133,202	--	14,700	--	1,740	1,740
Europium-154	15585-10-1	pCi/g	0.033	--	4.4	--	78	4.8	3.9	4,846	39,961	--	4,846	39,961	--	12,500	--	1,610	1,610
Europium-155	14391-16-3	pCi/g	0.054	--	327	--	5,869	354	125	48,462	399,606	--	48,462	399,606	--	153,000	--	33,400	33,400
Nickel-63	13981-37-8	pCi/g	--	--	608	--	575,308	91,576	4,013	2,314	9,438	83	2,314	9,438	166	--	--	--	--
Plutonium-238	13981-16-3	pCi/g	0.0038	--	236	--	3,818	605	35	1,212	9,990	--	1,212	9,990	--	17,500	--	20,900	5,980
Plutonium-239/240	PU-239/240	pCi/g	0.025	--	203	--	3,342	539	35	1,212	9,990	--	1,212	9,990	--	12,700	--	22,300	6,270
Total beta radiostrontium (Sr-90)	SR-RAD	pCi/g	0.18	--	2.3	--	5,064	518	4.5	672	1,518	28	672	1,518	55	3,580	--	112	91
Tritium	10028-17-8	pCi/g	--	--	623	--	15,376	1,265,436	459	1,038	1,127	13	1,038	1,127	25	1,680,000	--	936	420
Uranium-233/234	U-233/234	pCi/g	1.1	--	133	--	5,808	931	1.1	17	38	1.1	17	38	1.1	51,600	--	6,370	14,200
Uranium-235	15117-96-1	pCi/g	0.11	--	16	--	295	22	0.61	17	38	0.50	17	38	0.50	27,400	--	4,360	8,060
Metals																			
Antimony	7440-36-0	mg/kg	0.13	32	--	--	365	--	32	9.3	24	5.0	8.6	22	5.0	842	842	--	146
Arsenic	7440-38-2	mg/kg	6.5	20 ^m	--	42,414	4.5	--	20	0.072	0.16	20	0.022	0.051	20	128	128	2,284	127
Barium	7440-39-3	mg/kg	132	16,000	--	>1,000,000	182,481	--	5,600	20,238	166,573	200	10,119	83,286	400	500	358	1,687	2,265
Boron	7440-42-8	mg/kg	3.9	16,000	--	>1,000,000	182,500	--	7,200	3,960	8,999	320	-- ^k	-- ^k	--	30	58	91	91
Cadmium	7440-43-9	mg/kg	0.56	40	--	101,322	821	--	14	61	500	0.81	3.0	25	0.81	9.8	20	29	624
Chromium	7440-47-3	mg/kg	18.5	120,000	--	--	>1,000,000	--	80,000	-- ^l	-- ^l	18.5	-- ^l	-- ^l	19	259	149	109	517
Copper	7440-50-8	mg/kg	22	3,200	--	--	36,500	--	2,960	5,701	46,910	59	80	660	22	70	58	213	579
Cr(VI)	18540-29-9	mg/kg	--	240	--	2,171	2,737	--	2.1	17	28	4.8	3.5	5.9	2.0	--	--	--	--
Lead	7439-92-1	mg/kg	10.2	250 ^m	--	--	--	--	35 ²	182	1,499	10.2	26	211	10	9,090	1,700	156	1,578
Manganese	7439-96-5	mg/kg	512	11,200	--	>1,000,000	127,658	--	3,760	-- ^l	-- ^l	512	-- ^l	-- ^l	512	1,260	1,260	14,407	3,322
Mercury	7439-97-6	mg/kg	0.013	24	--	>1,000,000	274	--	24	24	200	0.33	0.15	1.2	0.33	0.3	12.5	2.0	1.6

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Note: Yellow highlighted values are the most conservative PRGs listed above the background value for each analyte, except for Arsenic, which is compared to the WAC 173-340-900, Table 740-1, Method A soil cleanup level for unrestricted Land Use, and Cr(VI) which is compared to the interim action RAG of 2.0 mg/kg. Green highlighted values are the most conservative GWP PRG value or SWP value between the 100:0 Contaminant Source Models; xcept for Arsenic, which is compared to the WAC 173-340-900, Table 740-1, Method A soil cleanup level for unrestricted Land Use, and Cr(VI) which is compared to the interim action RAG of 2.0 mg/kg.

- a. Hanford Site background values for nonradionuclides: DOE/RL-92-24, Vol. 1, Rev. 4, Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes, ECF-Hanford-11-0038, Soil Background Data for Interim Use at the Hanford Site; Hanford Site background values for radionuclides: DOE/RL-96-12, Rev. 0, Hanford Site Background: Part 2, Soil Background for Radionuclides.
- b. ECF-HANFORD-10-0444, Documentation of Standard Method B Contact Cleanup Levels for Unrestricted Land Use; WAC 173-340-740 (3) Method B Soil Cleanup Levels for Unrestricted Land Use; PRGs for Total Petroleum Hydrocarbons and Lead are based on MTCA Method A values.
- c. ECF-HANFORD-10-0429, Documentation of Preliminary Remediation Goals (PRGs) for Radionuclides Using the IAROD Exposure Scenario for the 100 and 300 Area Remedial Investigation/Feasibility Study (RI/FS) Report.
- d. ECF-HANFORD-11-0033, Calculation of Inhalation Pathway Preliminary Remediation Goals Using Standard Method B Air Cleanup Levels for the 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports; WAC 173-340-750, "Cleanup Standards to Protect Air Quality."
- e. ECF-HANFORD-10-0445, Documentation of Preliminary Remediation Goals (PRGs) for Nonradionuclides for the Casual Recreational User Exposure Scenario.
- f. ECF-HANFORD-10-0446, Documentation of Preliminary Remediation Goals (PRGs) for Radionuclides for the Casual Recreational User Exposure Scenario.
- g. ECF-HANFORD-11-0142, Documentation of Preliminary Remediation Goals (PRGs) for Radionuclides for the Resident Monument Worker Exposure Scenario.
- h. DOE/RL 96-17, Remedial Design Report/Remedial Action Work Plan for the 100 Area, Rev. 6.
- i. ECF-HANFORD-11-0063, STOMP 1-D Modeling for Determination of Preliminary Remediation Goals for 100 Area Source Operable Units D, H, and K.
- j. ECF-HANFORD-11-0060, Preliminary Remediation Goals (SSLs in Upland Soil for Terrestrial Ecological Receptors for 100 Area RI/FSs).
- k. A GWP or SWP PRG is not calculated because a groundwater cleanup level or MCL is not available for this analyte.
- l. For calculated soil activities or PRGs protective of groundwater STOMP 1-D predicts these analytes will not reach peak groundwater concentration within 10,000 years assuming that 100% of the vadose zone is contaminated.
- m. Arsenic and lead values are obtained from the WAC 173-340-900, Table 740-1, Method A soil cleanup level for unrestricted Land Use.