Table 11.1. PORTS Soil COCs Preliminary Remediation Goals Selection Process

Analysis Type	Chemical	Industrial Worker HI (mg/kg)	Industrial Worker ELCR (mg/kg or pCi/g)	Outdoor Worker HI (mg/kg)	Outdoor Worker ELCR (mg/kg or pCi/g)	Construction Worker HI (mg/kg)	Construction Worker ELCR (mg/kg or pCi/g)	Soil-to-GW (DAF 20)[1] (mg/kg or pCi/g)	Soil Background (mg/kg or pCi/g) (0-1 ft)	Soil Background (mg/kg or pCi/g) (1-16 ft)	Soil Background (mg/kg or pCi/g) (16-30 ft)	ARARs (mg/kg)	Selected Soil PRG (mg/kg or pCi/g) (0-1 ft)	Selected Soil PRG (mg/kg or pCi/g) (1-16 ft)	Selected Soil PRG (mg/kg or pCi/g) (16-30 ft)
Metals	Antimony	93.4	--	51.9	--	62	--	**5.4**	2.0	1.8	**3.5**	--	5.4	5.4	3.5
	Arsenic	115	36.3	53.2	16.7	21.5	271	41.6	**31**	**29**	**86**	--	31	29	86
	Chromium	--	--	--	--	--	--	0.4	**32**	**29**	**25**	--	32	29	25
	Chromium, hexavalent	692	61	387	35.1	206	134	**14.4**[2]	--	--	--	--	14.4	14.4	--
	Cobalt	68.6	8449	38.5	9387	20.4	1395	0.5	**28**	**37**	**19**	--	28	37	19
	Iron	163520	--	90844	--	119000	--	704	**86080**	**62782**	**56423**	--	86080	62782	56423
	Lead	**800**	**800**	**800**	**800**	**800**	**800**	8490	--	--	--	--	800	800	--
	Manganese	4647	--	2823	--	165	--	14.5	**1858**	**1491**	**465**	--	1858	1491	465
	Nickel	4264	292449	2477	324944	284	48250	**51.2**	23	50	**53**	--	51	51	53
	Selenium	1168	--	649	--	841	--	**15.2**	1.8	0.6	**0.6**	--	15.2	15.2	0.6
	Thallium	2.3	--	**1.3**	--	1.7	--	2.8	0.33	0.36	**0.82**	--	1.3	1.3	0.82
	Total Uranium	679	--	383	--	27.3	--	**8.6**	4.1	4.7	**7.2**	--	8.6	8.6	7.2
	Vanadium	1152	--	647	--	286	--	17.3	**78**	**58**	**65**	--	78	58	65
Organics	1,1,1-Trichloroethane	640	--	640	--	640	--	**1.4**	--	--	--	--	1.4	1.4	--
	1,1-Dichloroethene	137	--	150	--	180	--	**0.05**	--	--	--	--	0.05	0.05	--
	1,2-Dichloroethene	1290	--	1168	--	1290	--	**0.10**	--	--	--	--	0.10	0.10	--
	1,4-Dioxane	7005	327	2735	128	3280	3505	**0.003**	--	--	--	--	0.003	0.003	--
	Bromodichloromethane	931	8.9	931	9.7	931	302	**0.001**	--	--	--	--	0.001	0.001	--
	Chloroform	145	9.5	151	10.5	202	327	**0.001**	--	--	--	--	0.001	0.001	--
	cis-1,2-Dichloroethene	467	--	260	--	2370	--	**0.41**	--	--	--	--	0.41	0.41	--
	Dibenzofuran	171	--	130	--	170	--	**0.29**	--	--	--	--	0.29	0.29	--
	Tetrachloroethene	54.1	166	57.9	166	70.9	83	**0.045**	--	--	--	--	0.045	0.045	--
	Trichloroethene	2.6	42.5	2.8	44.6	3.38	346	**0.036**	--	--	--	--	0.036	0.036	--
PAHc	Total PAHc	--	32.7	--	11.7	--	305.5	**4.7**	--	--	--	--	4.7	4.7	--
PAHnc	Total PAHnc	368	--	335	--	340	--	**0.4**	--	--	--	--	0.4	0.4	--
PCBs	Total PCBs	4.7	16.3	1.6	5.7	1.6	149	0.2	--	--	--	**25**	25	25	--
RADs	Americium-241	--	56.1	--	**26.9**	--	1130	522	--	--	--	--	26.9	26.9	--
	Uranium-233/234	--	285	--	161	--	5750	**2.9**	1.3	1.6	**2.4**	--	2.9	2.9	2.4
	Uranium-235/236	--	3.8	--	**1.7**	--	63	2.9	0.10	0.12	**0.17**	--	1.7	1.7	0.17
	Uranium-238	--	18	--	8	--	177.5	**2.9**	1.4	1.6	**2.4**	--	2.9	2.9	2.4
	Technetium-99	--	850	--	4395	--	93500	**71.8**	--	--	--	--	71.8	71.8	--

Notes:
[1] Soil to Groundwater modeling is based on either the maximum contaminant level (MCL) or the residential exposure risk/hazard if no MCL exists
[2]According to EPA (https://www.epa.gov/dwstandardsregulations/chromium-drinking-water), an MCL of 100 ug/L can be used for hexavalent chromium. To ensure that the greatest potential risk is addressed, EPA's regulation assumes that a measurement of total chromium is 100 percent hexavalent chromium, the more toxic form of chromium (EPA 2019). Using an MCL of 100 ug/L for hexavalent chromium, the soil-to-groundwater screening level at a DAF=20 becomes 14.4 mg/kg.

Bolded value indicates selected PRG
Industrial scenarios collectively represent depth range of 0-16 ft bgs
PRG based on HI=0.1 and ELCR=5E-6 or Soil-to-Groundwater DAF20
-- = not applicable

ARARs = applicable or relevant and appropriate requirement
COC = contaminant of concern
DAF20 = dilution factor of 20
ELCR = excess lifetime cancer risk
GW= groundwater
HI= Hazard Index
PAHc =Carcinogenic polycyclic aromatic hydrocarbon
PAHnc =Noncarcinogenic polycyclic aromatic hydrocarbon
PCB= polychlorinated biphenyls
pCi/g = picocuries per gram
PRGs = preliminary remediation goals
RADs = radionuclides

Table 11.2. PORTS Soil COCs Preliminary Remediation Goals

Analysis Type	Chemical	Selected Soil PRG (mg/kg or pCi/g)		
		(0-1 ft)	(1-16 ft)	(16-30 ft)
Metals	Antimony	5.4	5.4	3.5
	Arsenic	31	29	86
	Chromium	32	29	25
	Chromium, hexavalent	14.4	14.4	--
	Cobalt	28	37	19
	Iron	86080	62782	56423
	Lead	800	800	--
	Manganese	1858	1491	465
	Nickel	51	51	53
	Selenium	15.2	15.2	0.6
	Thallium	1.3	1.3	0.82
	Total Uranium	8.6	8.6	7.2
	Vanadium	78	58	65
Organics	1,1,1-Trichloroethane	1.4	1.4	--
	1,1-Dichloroethene	0.05	0.05	--
	1,2-Dichloroethene	0.10	0.10	--
	1,4-Dioxane	0.003	0.003	--
	Bromodichloromethane	0.001	0.001	--
	Chloroform	0.001	0.001	--
	cis-1,2-Dichloroethene	0.41	0.41	--
	Dibenzofuran	0.29	0.29	--
	Tetrachloroethene	0.045	0.045	--
	Trichloroethene	0.036	0.036	--
PAHc	Total PAHc	4.7	4.7	--
PAHnc	Total PAHnc	0.4	0.4	--
PCBs	Total PCBs	25	25	--
RADs	Americium-241	26.9	26.9	--
	Uranium-233/234	2.9	2.9	2.4
	Uranium-235/236	1.7	1.7	0.17
	Uranium-238	2.9	2.9	2.4
	Technetium-99	71.8	71.8	--

Notes:
PRG based on HI = 0.1 and ELCR = 5E-6 or Soil-to-Groundwater DAF20 or background concentration.
-- = not applicable

COC = contaminant of concern
DAF20 = dilution factor of 20
ELCR = excess lifetime cancer risk
HI= hazard index
PAHc = carcinogenic polycyclic aromatic hydrocarbon
PAHnc = noncarcinogenic polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
PRG = preliminary remediation goal
RAD = radionuclide
SVOC = semivolatile organic compound
VOC = volatile organic compound

Table 12.1. Background UTLs for Gallia and Berea

Parameter	Background UTL Gallia (µg/L)	Background UTL Berea (µg/L)
Antimony	36.5	39.5
Arsenic	92	12
Barium	151	4,011
Beryllium	6.5	7
Cadmium	6.5	7
Chromium	21	17.5
Cobalt	13	91
Copper	21	22.5
Total Cyanide	10.5	10.5
Fluoride	410	4,212
Hexavalent Chromium	20.5	37.5
Lead	16	10
Mercury	1.5	1.5
Nickel	30.5	840
Selenium	10.5	10.5
Silver	10.5	11
Thallium	10.5	21.5
Tin	36.5	39.5
Vanadium	41	12.5
Zinc	106	115
Total Uranium[1]	1	1

Notes:
[1]Background values modified per DOE 1996h, *Background Sampling Investigation (BSI) of Soil and Groundwater Final Report for Portsmouth Gaseous Diffusion Plant*, *Piketon*, *Ohio*, DOE/OR/11-1323&D6.

NA = not available

UTL = upper tolerance limit

Table 12.2. PORTS Groundwater Preliminary Remediation Goals

Analysis Type	Chemical	Residential HI=0.1 (µg/L)	Residential ELCR=5×10^{-6} (µg/L or pCi/L)	ARARs MCLs (µg/L or pCi/L)	Selected Groundwater PRG[1] (µg/L or pCi/L)
Metals	Aluminum	**2,000**	--	--	2,000
	Antimony	0.78	--	**6**	6
	Arsenic	0.6	0.26	**10**	10
	Beryllium	2.46	--	**4**	4
	Cadmium	0.92	--	**5**	5
	Chromium, hexavalent	4.45	**0.2**	--	**0.2**
	Chromium, trivalent	**2,250**	--	--	2,250
	Chromium	--	--	**100**	100
	Cobalt	**0.60**	--	--	0.60
	Fluoride	**79.9**	--	--	79.9
	Iron	**1,400**	--	--	1,400
	Lead	--	15	**15**	15
	Manganese	**43.3**	--	--	43.3
	Nickel	**39.2**	--	--	39.2
	Silver	**9.4**	--	--	9.4
	Thallium	0.02	--	**2**	2
	Total Uranium	6.0	--	**30**	30
	Vanadium	**8.64**	--	--	8.64
	Zinc	**600**	--	--	600
Organics	1,1,2,2-Tetrachloroethane	36.1	**0.4**	--	0.4
	1,1-Dichloroethene	28.5	--	**7**	7
	1,2-Dichloroethene	**16.3**	--	--	16.3
	1,4-Dioxane	60	**3.9**	--	3.9
	Bromodichloromethane	37.8	**0.7**	--	0.7
	Carbon Tetrachloride	4.95	2.3	**5**	5
	Chloroform	9.72	**1.1**	--	1.1
	Dibromochloromethane	37.9	**0.84**	--	0.84
	Fluoranthene	3.6	--	**0.2**	0.2
	Naphthalene	3.6	--	**0.2**	0.2
	Pyrene	3.6	--	**0.2**	0.2
	Tetrachloroethene	4.06	56.0	**5**	5
	Trichloroethene	0.3	2.77	**5**	5
	Vinyl Chloride	4.44	0.02	**2**	2
Radionuclides[2]	Uranium 233/234	--	3.7	**10.2**	10.2
	Uranium 235/236	--	3.6	**46.6**	46.6
	Uranium-238	--	3.0	**9.9**	9.9

Notes:
[1]If an MCL exists, it is selected as the PRG. If an MCL is unavailable, the residential risk/hazard-based value is selected.
[2]Derived standards for radionuclides were taken from DOE 2015h, *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Kentucky* (DOE/LX/07-0107&D2/R2/V2, June)

Bolded value indicates selected PRG.
ARAR = applicable or relevant and appropriate requirement
DOE = U.S. Department of Energy
ELCR = excess lifetime cancer risk
HI = hazard index
MCL = maximum contaminant level
PRG = preliminary remediation goal