TABLE 27. SORPTION COEFFICIENT (K_d) VALUES FOR RADIONUCLIDES AND METALS

Ac-225	4.5	Sheppard, M.I. and Thibault, D.H. 1990 gave a calculated Kd value = 450 L/kg, which was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. In the model, the Kd value was conservatively set two orders of magnitude lower t
		Lowest value from McKinley, I.G., et al. 1991, in surficial sediments is 250 L/kg.
Ag-105 Ag-108m	2.7	Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values). The range of 12 reported values in sand was 2.7 to 1,000 L/kg, with a mean value of 90 L/kg.
Ag-110m Ag-111		Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 10 L/kg. Recommended value is 100 L/kg.
Ag		Site-specific in-situ Kd value of 218 L/kg (+/- 0.5) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 0.579 L/kg, with a range of 0 to 6.72 L/kg.
Al-26	15	Default Kd estimated to be 1500 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Am-241	1	Lowest Kd value from "Estimation of Geochemical Parameters for Assessing Subsurface Transport at the Savannah River Plant," by B.B. Looney, M.W. Grant, and C.M. King, DuPont DPST-85-904, March 1987, Table 1, is 1 L/kg. Recommended value is 100 L/kg.
Am-242 Am-242m		Lowest Kd value for soil/surface sediments found in McKinley, I.G. and Scholtis, A., 1993, Table 4. Kd values for soil/surface sediments ranged from 100 to 100,000 L/kg.
Am-243		Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 8.2 L/kg. The range of 29 reported values in sand was 8.2 to 300,000 L/kg, with a mean value of 1,900 L/kg.
As-73 As-74	1	Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 10 L/kg. Reported range is 1-10. Recommended value is 3.16 L/kg.
As		Site-specific in-situ Kd value of 103 L/kg (+/- 1.6) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 4.5 L/kg, with a range of 3.66 to 45.6 L/kg.
Au-195 Au-198 Au-199	0.25	Default Kd estimated to be 25 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Ba-133 Ba-140	10	Literature range of Ba Kd values in Bingham (1993) report is 10 - 1,000,000 L/kg, and 10 L/kg value was by DRC in previous modeling. The contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984) uses a default Kd value of 60 L/kg.
Ba		Site-specific in-situ Kd value of 9,224 L/kg (+/- 77) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 14.2 L/kg, with a range of 9 to 22.2 L/kg.
Be-7	2.5	Sheppard, M.I. and Thibault, D.H. (1990) calculated Kd value = 250 L/kg, which was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. In the model, the Kd value conservatively set two orders of magnitude lower than calcu
		The CR values used were taken from Baes et al. (1984)
Be		Site-specific in-situ Kd value of 121 L/kg (+/- 0.15) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 27.9 L/kg, with a range of >27.9 to >2,862 L/kg.
Bk-249	0.001	Kd unknown, therefore conservatively assigned a value of 0.001 L/kg.
Bk-250		Berkelium is a member of the actinide rare earth series. All rare earth elements have similar physical and chemical properties. ("General Chemistry" by Nebergall, et al., 1976.)
		Kd values are available for Np, Am and Cm, which are also actinide rare earth elements. Consequently, it is reasonable to assign the lowest Kd value from these three elements (Am) to berkelium, Kd = 1 L/kg.
Bi-205 Bi-206 Bi-207 Bi-210m	1	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 100 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR va
C-14	8.52	Kd value from site-specific measurements. See the Response to Interrogatories (ABC 1997) which includes a re-evaluation of the Bingham (1995) Kd values. (Summary of Results, Radionuclide Kd Tests, Bingham Environmental, Inc. August 3, 1995).
		The lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 1.7 L/kg. The range of 3 reported values in sand was 1.7 to 7.1 L/kg, with a mean value of 5 L/kg.
Ca-45 Ca-47	0.05	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 50 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR va
Cd-109	1	Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 1 L/kg. Recommended value is 6.3 L/kg.
Cd-113m		Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 2.7 L/kg. The range of 14 reported values in sand was 2.7 to 625 L/kg, with the mean value at 80 L/kg.
Cd		Site-specific laboratory batch Kd of 2.39 determined by MFG (2000), with a range of 0.703 to 4.0 L/kg.
Ce-139	1	Lowest Kd value found in Looney, et al., March, 1987, Table 1. Recommended value is 1000 L/kg.
Ce-141 Ce-143 Ce-144		Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 40 L/kg. The range of 12 reported values in sand was 40 to 3,968 L/kg, with a mean value of 500 L/kg.
Cf Cf-248	2	Kd value of 2.0 is two orders of magnitude lower than the default Kd value of 200 L/kg used in the RESRAD code (EAD, 2001; Yu et al., 1993, 2000). The RESRAD code was developed at Argonne National Laboratory and is authorized for use at DOE Sites, under
Cf-249 Cf-250		In NUREG/CR-5512, Vol. 1, a Cf Kd value of 510 is used (Kennedy and Strenge, 1992). A letter report prepared by Sandia National Laboratory for the NRC reviewed the parameter data for NUREG/CR-5512 and suggesgted a Kd value of 158 for Cf (Beyeler, et al.,
Cf-251 Cf-252		Californium is a member of the actinide rare earth series. All rare earth elements have similar physical and chemical properties. ("General Chemistry" by Nebergall, Schmidt, and Holtzclaw, D.C. Health and Company, 1976, p. 905). Kd values are available

TABLE 27. SORPTION COEFFICIENT (K_d) VALUES FOR RADIONUCLIDES AND METALS

Cl-36	0.0025	Default Kd estimated to be 0.25 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). Kd value in model is conservatively set two orders of magnitude lower than the default value used by TERRA.
Cm-241 Cm-242 Cm-243 Cm-244 Cm-245 Cm-246 Cm-247 Cm-248	93.3	Lowest Kd value found in Baes, C.F. and Sharp, R.D. (1983) is 93.3. The range of the 31 reported values was 93.3 to 51,900 L/kg in agricultural soils and clays. The lowest Kd value found in Looney, et al., March, 1987, Table 1 is 100 L/kg. Recommended value is 3162 L/kg. Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 780 L/kg. The range of 2 reported values in sand was 780 to 22,970 L/kg, with a mean value of 4,000 L/kg.
Co-56 Co-57 Co-58 Co-60	370	Site-specific Kd, reported by Bingham, 1996. Consistent with range of values in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1. The range of 33 reported values in sand was 0.07 to 9,000 L/kg, with a mean value of 60 L/kg. Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 0.1 L/kg. Recommended value is 1 L/kg.
Cr Cr-51	1	Lowest Kd value found in Looney, et al., March, 1987, Table 1. Recommended value is 39.8 L/kg. Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 1.7 L/kg . The range of 15 reported values in sand was 1.7 to 1,729 L/kg, with a mean value of 70 L/kg. Site-specific in-situ Kd value of 459 L/kg (+/- 3.0) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 6.23 L/kg, with a range of 5.69 to 758 L/kg.
Cs-134 Cs-135 Cs-136 Cs-137	133	Site-specific Kd, reported by Bingham, 1996. Consistent with range of values in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (Range of 81 reported values in sand was 0.2 to 10,000 L/kg, with a mean value of 280 L/kg.) Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 10 L/kg. Recommended value is 501.1 L/kg.
Cu Cu-67	1	Lowest Kd value found in Looney, et al., March, 1987, Table 1 is 1 L/kg. Recommended value is 25.11 L/kg. Site-specific laboratory batch Kd of 8.58 determined by MFG (2000), with a range of 0 to >2,365 L/kg.
Dy-166	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Es-253 Es-254	0.001	Kd unknown, therefore conservatively assigned a value of 0.001 L/kg.
Eu-152 Eu-154 Eu-155 Eu-156	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Fe-52 Fe-55 Fe-59 Fe-60	1.4	Lowest Kd value found in Baes, C.F. and Sharp, R.D. (1983) is 1.4. The range of the 30 reported values was 1.4 to 1,000 L/kg in agricultural soils and clays. Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values) is 5 L/kg. The range of 16 reported values in sand was 5 to 6,000 L/kg, with a mean value of 280 L/kg. Lowest Kd value found in Looney, et al., March, 1987, Table 1. Recommended value is 100 L/kg.
Fm-252	0.001	Kd unknown, therefore conservatively assigned a value of 0.001 L/kg.
Ga-67	15	Default Kd estimated to be 1500 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Gd-148 Gd-153	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Ge-68	0.25	Default Kd estimated to be 25 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
H-3	0.04	Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values).
Hf-172 Hf-175 Hf-181	4.5	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 450 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR v
Hg Hg-194 Hg-203	10	Kd value of 10.0 was from DRC, taken from Bingham Environmental value for stable mercury. (May, 1993 Report, Table 4-2 and August, 1993 Report, Table 3-4. Lowest Kd value found in Buchter et al., 1989, Table 3, for a sandy loam soil is 19.6 L/kg. The range of 11 reported values in various soil types was 19.6 to 299.2 L/kg. Kd values in interbed sediment range from 80.8 to 998 L/kg (Del Debbio, J.A., 1991). Site-specific laboratory batch Kd of 387 determined by MFG (2000), with a range of 0.586 to >388 L/kg.
Ho-166m	2.5	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 250 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd.
I-125 I-126 I-129 I-131 I-133	0.12	Kd value from Summary of Results, Radionuclide Kd Tests (Bingham Environmental, Inc. August 3, 1995) was 0.7 L/Kg. Re-evaluated in Response to Interrogatories (ABC 1997), with a recommended value of 0.46. Lowest slope of curve is 0.12 L/kg. The lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 0.04 L/kg. The range of 22 reported values in sand was 0.04 to 81 L/kg, with a mean value of 1.0 L/kg.

TABLE 27. SORPTION COEFFICIENT (K_d) VALUES FOR RADIONUCLIDES AND METALS

In-111 In-113m In-114 In-114m	15	Default Kd estimated to be 1500 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Ir-192	1.5	Default Kd estimated to be 150 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
K-40	0.15	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 15 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR val The lowest published Kd value for potassium is 2.0, found in Dragun (1988)
Kr-85	0.001	Kd unknown, therefore conservatively assigned a value of 0.001 L/kg.
La-140	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Mn-52 Mn-52m Mn-54	6.4	Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values). The range of 54 reported values was 6.4 to 5,000 L/kg, with a mean value of 50 L/kg.
Mo Mo-99	1.0	Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 1.0 L/kg. The range of 15 reported values in sand was 1.0 to 32 L/kg, with a geometric mean value of 10 L/kg. Kd conservatively set one order of magnitude lower than site-specific in-situ Kd value of 6.5 L/kg (+/- 0.51) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 0 L/kg, with a range of 0 to 0.260 L/kg.
Na-22	1	Default Kd estimated to be 100 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Nb-93m Nb-94	1.6	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 160 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR values used were taken from Baes et al. (1984)
Nd-144 Nd-147	6.5	Kd assigned a conservatively low value of 6.5 L/kg. The contaminant transport modeling code "TERRA" developed by ORNL uses a default value of 650 L/kg (Baes et al. 1984).
Ni-59 Ni-63 Ni-63	10	Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 10 L/kg. Recommended value is 100 L/kg. Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 60 L/kg. The range of 11 reported values was 60 to 3,600 L/kg, with a mean value of 400 L/kg. Site-specific in-situ Kd value of 170 L/kg (+/- 2.7) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 18.6 L/kg, with a range of >7.96 to 60.9 L/kg.
Np-235 Np-237	3	Kd value from Summary of Results, Radionuclide Kd Tests (Bingham Environmental, Inc. August 3, 1995) was 400. Re-evaluation of the data (ABC 1997 Response to Interrogatories) calculated a Kd of 425. DRC recommended using the literature value. Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kds), is 0.5 L/kg, but applies to pH 2.0 solutions. Lowest value for pH>4.0 is greater than 3 L/kg. For pH = 7, Kd is over 20.
Os-191 Os-191m Os-194	4.5	Default Kd estimated to be 450 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Pa-231 Pa-233 Pa-234 Pa-234m	5.5	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 550 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR va
P-32 P-33	0.035	Default Kd estimated to be 3.5 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Pb-203 Pb-210	19	Note: Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 19 L/kg. The range of 3 reported values in sand was 19 to 1,405 L/kg, with a mean value of 150 L/kg. Geometric mean Kd is 270 L/kg. Default Kd estimated to be 900 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). Site-specific in-situ Kd value of 686 L/kg (+/- 1.4) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 10.6 L/kg, with a range of >10.6 to >3,194 L/kg.
Pd-103	0.55	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 55 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR va
Pm-143 Pm-147	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Po-208 Po-210	9	Note: Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 9 L/kg. The range of 36 reported values in sand was 9 to 7,020 L/kg, with a mean value of 150 L/kg.

TABLE 27. SORPTION COEFFICIENT (K_d) VALUES FOR RADIONUCLIDES AND METALS

Pu-236 Pu-238 Pu-239 Pu-240 Pu-241 Pu-242 Pu-243 Pu-244	10	Lowest Kd value found in Looney, et al., March, 1987, Table 1. Recommended value is 100 L/kg. Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 27 L/kg. The range of 39 reported values in sand was 27 to 36,000 L/kg, with a mean value of 550 L/kg.
Pt-193	0.9	Kd assigned a conservatively low value of 0.9 L/kg. The contaminant transport modeling code "TERRA" developed by ORNL uses a default value of 90 L/kg (Baes et al. 1984).
Ra-225 Ra-226 Ra-228	10	Lowest Kd value found in Looney, et al., March, 1987, Table 1. Recommended value is 100 L/kg. Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 57 L/kg. The range of 3 reported values in sand was 57 to 21,000 L/kg, with a mean value of 500 L/kg.
Re-183 Re-184 Re-184m Re-186 Re-187 Re-188	0.075	Default Kd estimated to be 7.5 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Rb-82 Rb-83 Rb-84 Rb-86	0.55	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 55 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR values used were taken from Baes et al. (1984)
Rh-103m	0.001	Kd not reported in literature. Therefore assigned a value of 0.001 L/kg.
Ru-103 Ru-106	5	Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values). The range of 7 reported values in sand was 5 to 490 L/kg, with a mean value of 55 L/kg. Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 100 L/kg. Recommended value is 158 L/kg.
S-35	0.075	Default Kd estimated to be 7.5 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Sb-122 Sb-124 Sb-125 Sb-126 Sb-126m	100	Lowest Kd value found in Looney, et al., March, 1987, Table 1. Recommended value is 3162 L/kg. Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 45 L/kg, from one reported observation in sand.
Sc-44 Sc-46 Sc-47	10	Default Kd estimated to be 1000 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Se-75 Se-79	1	Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 1 L/kg. Recommended value is 2.5 L/kg. Lowest Kd value for soil/surface sediments found in McKinley, I.G. and Scholtis, A., 1993, Table 4. Kd values for soil/surface sediments ranged from 1 to 50 L/kg. Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 36 L.kg. The range of 3 reported values in sand was 36 to 70 L/kg, with a mean value of 55 L/kg. Lowest Kd value found for Se (IV) in Baes, C.F. and Sharp, R.D. (1983) is 1.2. The range of the 19 reported values was 1.2 to 8.6 L/kg. Site-specific in-situ Kd value of 62 L/kg (+/- 0.4) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 29.3 L/kg, with a range of 13.0 to >405 L/kg.
Si-32	0.35	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 35 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd.
Sm-145 Sm-151 Sm-153	2.45	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 245 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR va
Sn-113 Sn-117m Sn-119m Sn-121 Sn-121m Sn-126	50	Lowest Kd value for soil/surface sediments found in McKinley, I.G. and Scholtis, A., 1993, Table 4. Kd values for soil/surface sediments ranged from 50 to 700 L/kg. Sheppard, M.I. and Thibault, D.H. (1990) calculated Kd value = 130 L/kg; calculated using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR values used were taken from Baes et al. (1984) Recommended Kd value found in Looney, et al., March, 1987, Table 1, is 100 L/kg.
Sr-82 Sr-85 Sr-89 Sr-90	0.05	Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values). The range of 81 reported values in sand was 0.05 to 190 L/kg, with a mean value of 15 L/kg. Average Kd in near-neutral pH, saline brines is 0.66 L/kg, based on data from NTIS (1981) and Serne, et al. (1977). Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 1 L/kg. Recommended value is 2.5 L/kg.
Ta-182	2.2	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 220 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR va
Te-123m Te-125m Te-129 Te-129m	1.25	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 125 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd. The CR v

TABLE 27. SORPTION COEFFICIENT (K_d) VALUES FOR RADIONUCLIDES AND METALS

Tb-157 Tb-158 Tb-160	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Tc-95 Tc-95m	0.11	Site-specific Kd value from Summary of Results, Radionuclide Kd Tests (Bingham Environmental, Inc. August 3, 1995) was 0.07 L/kg. Re-evaluated in Response to Interrogatories (ABC 1997), result 0.11 L/kg .
Tc-99 Tc-99m		The lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 0.01 L/kg. The range of 19 reported values in sand was 0.01 to 16 L/kg, with a mean value of 0.1 L/kg.
Th-229 Th-230		Lowest Kd value for soil/surface sediments found in McKinley, I.G. and Scholtis, A., 1993, Table 4. Kd values for soil/surface sediments ranged from 80 to 60,000 L/kg.
Th-231	10	Lowest Kd value found in Looney, et al., March, 1987, Table 1. Recommended value is 100 L/kg.
Th-232		Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 207 L/kg. The range of 10 reported values in sand was 207 to 150,000 L/kg, with a mean value of 3,200 L/kg.
Ti-44	10	Default Kd estimated to be 1000 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Tl-201 Tl-202	0.15	Based on similarities between ionic radii and valance, thallium Kd estimated using lowest published potassium value of 2.0 found in Dragun, 1988 (Whetstone Associates, 2000).
Tl-204		The 'Kd value for potassium was conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 15 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlat
Tm-170 Tm-171	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
U-232 U-233 U-234	6	Site-specific Kd value from Summary of Results, Radionuclide Kd Tests (Bingham Environmental, Aug 3, 1995).
U-235 U-236 U-238		Lowest Kd value found in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values), is 0.03 L/kg. The range of 24 reported values in sand was 0.03 to 2,200 L/kg, with a mean value of 35 L/kg.
U-238		Lowest Kd value found in Looney, et al., March, 1987, Table 1, is 0.1 L/kg. Recommended value is 39.8 L/kg.
V-48	10	Default Kd estimated to be 1000 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
W-181 W-185 W-188	1.5	Default Kd estimated to be 150 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Xe-127 Xe-133 Xe-131m Xe-133m	0.001	Kd unknown, therefore conservatively assigned a value of 0.001 L/kg.
Y-88	1.7	Kd value conservatively set two orders of magnitude lower than calculated value by Sheppard, M.I. and Thibault, D.H. 1990. Calculated Kd value = 170 L/kg, was determined using the soil-to-plant ratio (CR), which is strongly correlated with Kd.
Y-91		The CR values used were taken from Baes et al. (1984)
Yb-169	6.5	Default Kd estimated to be 650 L/kg for contaminant transport modeling code "TERRA" developed by ORNL (Baes et al. 1984). In the model, the Kd value is conservatively set two orders of magnitude lower than the default value used by TERRA.
Zn Zn-65	368	Site-specific in-situ Kd value of 374 L/kg (+/- 4.1) determined by Enchemica (2002). MFG (2000) determined site-specific batch Kd of 116 L/kg, with a range of >116 to >1,648 L/kg. Site specific value of 368 L/kg approved by DRC (DRC, Feb 2003).
		Lowest Kd value in Sheppard, M.I. and Thibault, D.H., 1990, Table A-1 (sand soil Kd values) is 0.1 L/kg. The range of 22 reported values in sand was 0.1 to 8,000 L/kg, with a mean value of 200 L/kg.
		Lowest Kd value found in Looney, et al., March, 1987, Table 1, is also 0.1 L/kg. Recommended value is 15.8 L/kg.
Zr-88 Zr-93	10	Lowest Kd value for soil/surface sediments found in McKinley, I.G. and Scholtis, A., 1993, Table 4. Kd values for soil/surface sediments ranged from 10 to 8,300 L/kg.
Zr-95		Sheppard, M.I. and Thibault, D.H. (1990) calculated a Kd value of 600 L/kg. Calculation was based on the soil-to-plant ratio (CR), which is strongly correlated with Kd.