TRIM.FaTE Public Reference Library
Background Document
September 2016 (Updated)

This document contains tables listing the following input properties for which numerical values are provided in the September 2016 TRIM.FaTE Public Reference Library:

- chemical-independent parameters for abiotic compartment types;
- chemical-dependent (i.e., value varies by chemical) parameters for abiotic compartment types;
- chemical-independent parameters for biotic compartment types;
- chemical-dependent parameters for biotic compartment types;
- chemical-dependent parameters, independent of compartment type;
- source inputs; and
- “unset” inputs.

NOTE: These values are provided to assist new users in learning how to use TRIM.FaTE and set up TRIM.FaTE scenarios. It remains each user’s responsibility to confirm or identify alternative values that are appropriate for their application and customize the library for their use accordingly.

For each property listed in the tables, the parameter name, input units, value used (except where values are "unset" in the Public Reference Library), and a reference are given. Full citations for each reference are provided at the end of this document. There are five sets of chemical-dependent tables, one for mercury species, the second for cadmium, the third for arsenic, the fourth for polycyclic aromatic hydrocarbons (PAHs), and the fifth for dioxins/furans. Two attachments, referred to in the tables, provide additional detailed documentation.

Within the framework of the TRIM.FaTE computer model, several different kinds of properties are defined and used. The model inputs listed in this document fall into the following categories of TRIM.FaTE properties in the September 2016 Public Reference Library:

- compartment properties (includes by far the largest number of input parameters);
- volume element (VE) properties;
- link properties;
- chemical properties;
- source properties; and
- scenario properties.

In the following tables, the type of object (e.g., volume element, link) for which the property is defined is identified for all input parameters that are **not** compartment properties. Note that volume element, link, and scenario properties are not part of a TRIM.FaTE library. These properties are included in the tables for completeness, but values are not always included.

This document includes only those properties for which the Public Reference Library value is a numerical constant. There are many other properties in the library, described in the TRIM.FaTE Technical Support Document Volume II: Description of Chemical Transport and Transformation Algorithms (EPA 453/R-02-011b, September 2002), that are calculated from these inputs. These formula properties are not listed in the following tables.

Some of the tables in this document contain information for various terrestrial and semi-aquatic animal compartments. This information has not been updated or curated since 2005.

Note that the units listed in these tables are the units in which model input values need to be expressed for the algorithms in the current library. In a few cases, these computer model input units do not match the units used for the same parameter in equations and derivations in the TRIM.FaTE Technical Support Document Volume II. In such cases, there are internal unit conversions in the computer model that account for the differences.

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
AirDensity_g_cm3	Mass of air per unit volume of air, in g/cm3	g/cm^3	0.0012	U.S. EPA 1997.
DustDensity	Mass of atmospheric particulate per unit volume of atmospheric particulate	$kg[dust]/m^3[dust]$	1,400	Bidleman 1988.
DustLoad	Concentration of atmospheric dust particles in the air compartment	$kg[dust]/m^3[air]$	6.15E-08	Bidleman 1988.
FractionOrganicMatteronParticulates	Mass fraction of air particulates that is organic material	unitless	0.2	Harner and Bidleman 1998.

Chemical-Dependent / Abiotic for Mercury[a] -- Documentation for TRIM.FaTE Public Reference Library

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0	Professional judgment
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	Professional judgment.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0.00385	n/a	n/a	Low end of half-life range (6 months to 2 years) in U.S. EPA 1997.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	Professional judgment.
vdep	Speed at which chemical in particle form in air moves downward; used in estimating dry deposition of particles	m/day	500	500	500	Caltox value cited in McKone et al. 2001
Washout Ratio[b]	Precipitation scavenging ratio for particles in air (ratio of concentration of particles in rain to concentration of particles in air); used in estimating wet deposition of particles	m^3[air]/ m^3[rain]	200,000	200,000	200,000	MacKay et al. 1986.

[a]On this and all following tables for mercury species:
Hg(0) = Elemental Mercury
Hg(2) = Divalent Mercury
MHg = MethylMercury

[b]From the MacKay et al. 1986 article: "For chemicals that are primarily or totally in particulate form, Wv [ratio of precipitation concentration in moles per cubic meter of water to total air concentration in moles per cubic meter of air] approaches Q [scavenging ratio]. Vickers and Slinn (1979) quote Wv values for metals and radionuclides in the range 200,000 - 500,000 For illustrative purposes [the authors] select a value of 200,000. But it is likely that Q depends on particle size, collection efficiency, and meteorological factors such as storm type." Essentially, Q and Wv are approximately equal if most of the chemical in the air is sorbed to particles and not present as vapor. For metals that do not exit as vapor, the default value of 200,000 for Q cited in the paper is an upper-end approximation of the relative volume of air that a raindrop will scavenge particles from. If this value is adjusted to account for the particle bound fraction of chemical in the atmosphere, then multiplied by rain rate, you have the transfer factor.

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	n/a
vdep	Speed at which chemical in particle form in air moves downward; used in estimating dry deposition of particles	m/day	260	Calculated from Muhlbaier and Tissue 1980.
Washout Ratio[a]	Precipitation scavenging ratio for particles in air (ratio of concentration of particles in rain to concentration of particles in air); used in estimating wet deposition of particles.	m^3[air]/ m^3[rain]	200000	MacKay et al. 1986.

[a]From the MacKay et al. 1986 article: "For chemicals that are primarily or totally in particulate form, Wv [ratio of precipitation concentration in moles per cubic meter of water to total air concentration in moles per cubic meter of air] approaches Q [scavenging ratio]. Vickers and Slinn (1979) quote Wv values for metals and radionuclides in the range 200,000 - 500,000 For illustrative purposes [the authors] select a value of 200,000. But it is likely that Q depends on particle size, collection efficiency, and meteorological factors such as storm type." Essentially, Q and Wv are approximately equal if most of the chemical in the air is sorbed to particles and not present as vapor. For metals that do not exit as vapor, the default value of 200,000 for Q cited in the paper is an upper-end approximation of the relative volume of air that a raindrop will scavenge particles from. If this value is adjusted to account for the particle bound fraction of chemical in the atmosphere, then multiplied by rain rate, you have the transfer factor.

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	n/a
vdep	Speed at which chemical in particle form in air moves downward; used in estimating dry deposition of particles	m/day	500	McKone et al. 2001
Washout Ratio	Precipitation scavenging ratio for particles in air (ratio of concentration of particles in rain to concentration of particles in air); used in estimating wet deposition of particles.	m^3[air]/ m^3[rain]	200000	MacKay et al. 1986.

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.046	0.125	0.596	0.458	0.334	0.178	0.262	Howard et al. 1991; upper bound measured or estimated value.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
vdep	Speed at which chemical in particle form in air moves downward; used in estimating dry deposition of particles	m/day	500	500	500	500	500	500	500	McKone et al. 2001
Washout Ratio[b,c]	Precipitation scavenging ratio for particles in air (ratio of concentration of particles in rain to concentration of particles in air); used in estimating wet deposition of particles.	m^3[air]/ m^3[rain]	200,000	200,000	200,000	200,000	200,000	200,000	200,000	MacKay et al. 1986.

[a]On this and all following tables for polycyclic aromatic hydrocarbons (PAHs)
BaP = benzo(a)pyrene
BaA = Benz(a)anthracene
BbF = Benzo(b)fluoranthene
BkF = Benzo(k)fluoranthene
Chr = Chrysene
DahA = Dibenz(a,h)anthracene
IcdP = Indeno(1,2,3-cd)pyrene

[b]For this class of chemicals, some chemical-specific values for this property may be available in the literature. Depending on user-specific considerations, users may want to revise the library value from the general value t a chemical-specific one (see Wania et al. 1998).

[c]From the MacKay et al. 1986 article: "For chemicals that are primarily or totally in particulate form, Wv [ratio of precipitation concentration in moles per cubic meter of water to total air concentration in moles per cubic mete of air] approaches Q [scavenging ratio]. Vickers and Slinn (1979) quote Wv values for metals and radionuclides in the range 200,000 - 500,000. For illustrative purposes [the authors] select a value of 200,000. But it is likely that Q depends on particle size, collection efficiency, and meteorological factors such as storm type." Essentially, Q and Wv are approximately equal if most of the chemical in the air is sorbed to particles and not present as vapor. For metals that do not exit as vapor, the default value of 200,000 for Q cited in the paper is an upper-end approximation of the relative volume of air that a raindrop will scavenge particles from. If this value is adjusted to account for the particle bound fraction of chemical in the atmosphere, then multiplied by rain rate, you have the transfer factor.

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.154	0.092	0.3	0.208	0.215	0.46	0.46	Howard et al. 1991; upper bound measured or estimated value Exceptions include ATSDR 2005 (2-Methylnaphthalene), USEPA 1998 (7,12-Dimethylbenz(a)anthracene, Benzo(g,h,i)perylene, and Fluoranthene) / average of range, HSDB 2001d (Acenaphthene), HSDB 2001b (Acenaphthylene), and Spero et al. 2000 (Fluorene).
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
vdep	Speed at which chemical in particle form in air moves downward; used in estimating dry deposition of particles	m/day	500	500	500	500	500	500	500	McKone et al. 2001
Washout Ratio[b,c]	Precipitation scavenging ratio for particles in air (ratio of concentration of particles in rain to concentration of particles in air); used in estimating wet deposition of particles.	m^3[air]/ m^3[rain]	200000	200000	200000	200000	200000	200000	200000	Mackay et al. 1986.

[a]On this and all following tables for polycyclic aromatic hydrocarbons (PAHs)
2Methyl = 2-Methylnaphthalene
712DMB = 7,12-Dimethylbenz[a]Anthracene
BghiP = Benzo(ghi)perylene

[b]For this class of chemicals, some chemical-specific values for this property may be available in the literature. Depending on user-specific considerations, users may want to revise the library value from the general value t a chemical-specific one (see Wania et al. 1998).

[c]From the MacKay et al. 1986 article: "For chemicals that are primarily or totally in particulate form, Wv [ratio of precipitation concentration in moles per cubic meter of water to total air concentration in moles per cubic mete of air] approaches Q [scavenging ratio]. Vickers and Slinn (1979) quote Wv values for metals and radionuclides in the range 200,000 - 500,000. For illustrative purposes [the authors] select a value of 200,000. But it is likely that Q depends on particle size, collection efficiency, and meteorological factors such as storm type." Essentially, Q and Wv are approximately equal if most of the chemical in the air is sorbed to particles and not present as vapor. For metals that do not exit as vapor, the default value of 200,000 for Q cited in the paper is an upper-end approximation of the relative volume of air that a raindrop will scavenge particles from. If this value is adjusted to account for the particle bound fraction of chemical in the atmosphere, then multiplied by rain rate, you have the transfer factor.

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	12	18	42	28	28	64	162	Atkinson 1996 as cited in U.S. EPA 2000b; vapor phase reaction with hydroxyl radical.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
vdep	Speed at which chemical in particle form in air moves downward; used in estimating dry deposition of particles	m/day	500	500	500	500	500	500	500	McKone et al. 2001.
Washout Ratio[b]	Precipitation scavenging ratio for particles in air (ratio of concentration of particles in rain to concentration of particles in air); used in estimating wet deposition of particles	m^3[air]/ m^3[rain]	18,000	18,000	9,000	9,000	9,000	64,000	91,000	Vulykh et al. 2001.

[a]On this and all following tables for dioxins:
2,3,7,8-TCDD = 2,3,7,8-Tetrachlorodibenzo(p)dioxin
1,2,3,7,8-PeCDD = 1,2,3,7,8-Pentachlorodibenzo(p)dioxin
1,2,3,4,7,8-HxCDD = 1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin
1,2,3,6,7,8-HxCDD = 1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin
1,2,3,7,8,9-HxCDD = 1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin
1,2,3,4,6,7,8-HpCDD = 1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin
1,2,3,4,6,7,8,9-OCDD = 1,2,3,4,6,7,8,9-Octachlorodibenzo(p)dioxin

[b]Other chemical-specific values may be available in the literature see Hites and Harless (1991) and Koester and Hites (1992

Air Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	19	31	33	78	55	51	59	137	122	321	Atkinson 1996 as cited in U.S. EPA 2000b; vapor phase reaction with hydroxyl radical
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	0	0	0	0	0	0	0	0	0	n/a
vdep	Speed at which chemical in particle form in air moves downward; used in estimating dry deposition of particles	m/day	500	500	500	500	500	500	500	500	500	500	McKone et al. 2001.
Washout Ratio[b]	Precipitation scavenging ratio for particles in air (ratio of concentration of particles in rain to concentration of particles in air); used in estimating wet deposition of particles	n/a	19,000	13,000	14,000	10,000	10,000	10,000	10,000	32,000	32,000	22,000	Vulykh et al. 2001.

[a]On this and all following tables for furans:
2,3,7,8-TCDF = 2,3,7,8-Tetrachlorodibenzo(p)furan
1,2,3,7,8-PeCDF = 1,2,3,7,8-Pentachlorodibenzo(p)furan
2,3,4,7,8-PeCDF = 2,3,4,7,8-Pentachlorodibenzo(p)furan
1,2,3,4,7,8-HxCDF = 1,2,3,4,7,8-Hexachlorodibenzo(p)furan
1,2,3,6,7,8-HxCDF = 1,2,3,6,7,8-Hexachlorodibenzo(p)furan
1,2,3,7,8,9-HxCDF = 1,2,3,7,8,9-Hexachlorodibenzo(p)furan
2,3,4,6,7,8-HxCDF = 2,3,4,6,7,8-Hexachlorodibenzo(p)furan
1,2,3,4,6,7,8-HpCDF = 1,2,3,4,6,7,8-Heptachlorodibenzo(p)furan
1,2,3,4,7,8,9-HpCDF = 1,2,3,4,7,8,9-Heptachlorodibenzo(p)furan
1,2,3,4,6,7,8,9-OCDF = 1,2,3,4,6,7,8,9-Octachlorodibenzo(p)furan

[b]Other chemical-specific values may be available in the literature see Hites and Harless (1991) and Koester and Hites (1992)

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
Surface Soil Compartment Type				
AirSoilBoundaryThickness	Thickness of air above soil surface soil within which molecular diffusion between media can be significant (defines boundary between the well-mixed portion, where turbulent mixing is rapid and continuous, and the stable portion at the very edge of the interface)	m	0.005	Thibodeaux 1996; McKone et al. 2001 (Table 3).
AverageVerticalVelocity	Average speed of water movement downward through soil column (i.e., percolation)	m^3[water]/m^2[surface soil]-day (or m/day)	8.08E-04	Assumed as 0.2 times average precipitation for New England in McKone et al. 2001.
Fractionofareaavailableforerosion	Fraction of the total surface area for which erosion can occur	m^2[area available]/m^2[total]	1	Professional judgment; area assumed rural.
FractionofAreaAvailableforRunoff	Fraction of the total surface area for which runoff can occur	m^2[area available]/m^2[total]	1	Professional judgment; area assumed rural.
Fractionofareaavailableforverticaldiffusion	Fraction of the total surface area for which vertical diffusion can occur	m^2[area available]/m^2[total]	1	Professional judgment; area assumed rural.
OrganicCarbonContent	Mass fraction of soil or sediment solids that consists of organic carbon	kg [organic carbon]/kg[solids wet wt]	0.008[a]	U.S. average in McKone et al. 2001 (Table 16 and A-3).
rho	Density (mass per unit volume) of solid materials (e.g., dry soil, dry sediment particles)	kg[solid]/m^3[solid]	2,600	Default in McKone et al. 2001 (Table 3).
TotalErosionRate_kg_m2_day	Total mass of eroded surface soil particles per unit surface area per day	kg[soil]/m^2[surface soil]-day	unset	n/a
TotalRunoffRate_m3_m2_day	Total volume of liquid runoff from surface soil per unit surface area per day	m^3[water]/m^2[surface soil]-day	1.62E-03[a]	Calculated using scenario-specific precipitation rate and assumptions associated with water balance.
VolumeFraction_Liquid	Fraction of total compartment volume that is in liquid phase (e.g., soil or sediment pore space occupied by water)	volume[water]/volume[compartment]	0.19[a]	McKone et al. 2001 (table 15).
VolumeFraction_Vapor	Fraction of total compartment volume that is in vapor/gas phase (e.g., soil pore space occupied by air instead of water)	m^3[gas]/m^3[compartment]	0.28[a]	McKone et al. 2001.
Root Zone Soil Compartment Type				
AverageVerticalVelocity	Average speed of water movement downward through soil column (i.e., percolation)	m^3[water]/m^2[surface soil]-day (or m/day)	8.08E-04	Assumed as 0.2 times average precipitation for New England in McKone et al. 2001.
OrganicCarbonContent	Mass fraction of soil or sediment solids that consists of organic carbon	kg[organic carbon]/kg[solids wet wt]	0.008[a]	McKone et al. 2001 (Tables 16 and A-3, U.S. average).
rho	Density (mass per unit volume) of solid materials (e.g., dry soil, dry sediment particles)	kg[solid]/m^3[solid]	2,600	McKone et al. 2001 (Table 3).

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
VolumeFraction_Liquid	Fraction of total compartment volume that is in liquid phase (e.g., soil or sediment pore space occupied by water)	volume[water]/volume[compartment]	0.21[a]	McKone et al. 2001 (Table 16).
VolumeFraction_Vapor	Fraction of total compartment volume that is in vapor/gas phase (e.g., soil pore space occupied by air instead of water)	m^3[gas]/m^3[compartment]	0.25[a]	McKone et al. 2001 (Table 16).
Vadose Zone Soil Compartment Type				
AverageVerticalVelocity	Average vertical velocity of water (percolation)	m^3[water]/m^2[surface soil]-day (or m/day)	8.08E-04	Assumed as 0.2 times average precipitation for New England in McKone et al. 2001.
OrganicCarbonContent	Mass fraction of soil or sediment solids that consists of organic carbon	kg[organic carbon]/kg[solids wet wt]	0.003[a]	McKone et al. 2001 (Tables 16 and A-3, U.S. average).
rho	Density (mass per unit volume) of solid materials (e.g., dry soil, dry sediment particles)	kg[solid]/m^3[solid]	2,600	Default in McKone et al. 2001 (Table 3).
VolumeFraction_Liquid	Fraction of total compartment volume that is in liquid phase (e.g., soil or sediment pore space occupied by water)	m^3[liquid]/m^3[compartment]	0.21[a]	McKone et al. 2001 (Table 17 – national average).
VolumeFraction_Vapor	Fraction of total compartment volume that is in vapor/gas phase (e.g., soil pore space occupied by air instead of water)	m^3[gas]/m^3[compartment]	0.22[a]	McKone et al. 2001 (Table 17).
Ground Water Compartment Type				
OrganicCarbonContent	Mass fraction of soil or sediment solids that consists of organic carbon	kg[organic carbon]/kg[solids wet wt]	0.004	Professional judgement.
Porosity	Volume fraction of soil, ground water, or sediment compartment that is pore space (i.e., fraction liquid phase plus fraction gas phase in soil compartments or fraction liquid phase in groundwater and sediment compartments)	L[total pore space]/L[total compartment]	0.2	Default in McKone et al. 2001 (Table 3).
rho	Density (mass per unit volume) of solid materials (e.g., dry soil, dry sediment particles)	kg[solid]/m^3[solid]	2,600	Default in McKone et al. 2001 (Table 3).

[a]Scenario-specific parameters, values provided are for Tier 1 screenings.

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
Surface Soil Compartment Type						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.06	Range reported in Porvari and Verta 1995 is 3E-2 to 6E-2 /day; value is average maximum potential demethylation rate constant under anaerobic conditions.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	unset	unset	unset	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	Not used (model set to calculate value).
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[water]/kg[soil wet wt]	1,000	58,000	7,000	U.S. EPA 1997.
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	0	0.001	0	Range reported in Porvari and Verta 1995 is 2E-4 to 1E-3 /day; value is average maximum potential methylation rate constant under anaerobic conditions.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	0	0	Value assumed in U.S. EPA 1997.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	0	1.25E-05	0	Value used for untilled surface soil (2cm), 10% moisture content, in U.S. EPA 1997; general range is (0.0013/day)*moisture content to (0.0001/day)*moisture content for forested region (Lindberg 1996; Carpi and Lindberg 1997).
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	Setting selected for Reference Library
VaporDryDepositionVelocity_m_day	Speed at which chemical in vapor form in air moves downward; used in estimating dry deposition and/or diffusion of chemical vapors to soil and surface water	m/day	50	2,500	0	Hg(0) - from Lindberg et al. 1992; Hg(2) - estimate by USEPA using the Industrial Source Complex (ISC) Model - [See Vol. III, App. A of the Mercury Study Report (USEPA 1997)].
Root Zone Soil Compartment Type						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.06	Range reported in Porvari and Verta 1995 is 3E-2 to 6E-2 /day; value is average maximum potential demethylation rate constant under anaerobic conditions.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	unset	unset	unset	n/a

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	not used (model set to calculate value)
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[water]/kg[soil wet wt]	1,000	58,000	7,000	U.S. EPA 1997.
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	0	0.001	0	Range reported in Porvari and Verta 1995 is 2E-4 to 1E-3 /day; value is average maximum potential methylation rate constant under anaerobic conditions.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	0	0	Value assumed in U.S. EPA 1997.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	0	3.25E-06	0	Value used for tilled surface soil (20cm), 10% moisture content, in U.S. EPA 1997 (Lindberg 1996; Carpi and Lindberg, 1997).
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	Setting selected for Reference Library
Vadose Zone Soil Compartment Type						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.06	Range reported in Porvari and Verta 1995 is 3E-2 to 6E-2 /day; value is average maximum potential demethylation rate constant under anaerobic conditions.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	unset	unset	unset	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	Not used (model set to calculate value).
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[water]/kg[soil wet wt]	1,000	58,000	7,000	U.S. EPA 1997.
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	0	0.001	0	Range reported in Porvari and Verta 1995 is 2E-4 to 1E-3 /day; value is average maximum potential methylation rate constant under anaerobic conditions.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	0	0	Value assumed in U.S. EPA 1997.

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	0	3.25E-06	0	Value used for tilled surface soil (20cm), 10% moisture content, in U.S. EPA 1997 (Lindberg 1996; Carpi and Lindberg, 1997).
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	setting selected for Reference Library
Ground Water Compartment Type						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.06	Range reported in Porvari and Verta 1995 is 3E-2 to 6E-2 /day; value is average maximum potential demethylation rate constant under anaerobic conditions.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	unset	unset	unset	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[water]/kg[soil wet wt]	1,000	58,000	7,000	U.S. EPA 1997.
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	0	0.001	0	Range reported in Porvari and Verta 1995 is 2E-4 to 1E-3 /day; value is average maximum potential methylation rate constant under anaerobic conditions.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	1.00E-08	0	0	Small default nonzero value (0 assumed in U.S. EPA 1997).
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	0	3.25E-06	0	Value used for tilled surface soil (20cm), 10% moisture content, in U.S. EPA 1997 (Lindberg 1996; Carpi and Lindberg, 1997)

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
Surface Soil Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	Professional judgment
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	Calculated[a]	U.S. EPA 2005c.
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user- provided characteristic depth	0 = no, Else = yes	0	Setting selected for Reference Library
Root Zone Soil Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	Professional judgement
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	Calculated[a]	U.S. EPA 2005c.
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user- provided characteristic depth	0 = no, Else = yes	0	Setting selected for Reference Library
Vadose Zone Soil Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	Professional judgement
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	Calculated[a]	U.S. EPA 2005c.
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user- provided characteristic depth	0 = no, Else = yes	0	Setting selected for Reference Library
Ground Water Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	0	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	Calculated[a]	n/a

[a]Equation provided: 10**(-2.87671+0.495043*compartment.pH -0.00500349*compartment.fractionsand*100+0.55245*log10(compartment.organiccarboncontent*1000000))

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
Surface Soil Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	2512	Ambrose, 2005
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user- provided characteristic depth	0 = no, Else = yes	0	n/a
Root Zone Soil Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	2512	Ambrose, 2005
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user- provided characteristic depth	0 = no, Else = yes	0	n/a
Vadose Zone Soil Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	2512	Ambrose, 2005
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user- provided characteristic depth	0 = no, Else = yes	0	n/a
Ground Water Compartment Type				
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	0	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[liquid phase]/kg[solid phase]	Calculated[a]	n/a

[a]Equation provided: 10**(-2.87671+0.495043*compartment.pH -0.00500349*compartment.fractionsand*100+0.55245*log10(compartment.organiccarboncontent*1000000))

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Surface Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	530	680	610	2140	1000	940	730	MacKay et al. 2000 / average of range.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Not used (model set to calculate value).
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library.
Root Zone Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	530	680	610	2140	1000	940	730	Howard et al. 1991 / upper bound measured or estimated value.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Not used (model set to calculate value)
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library.
Vadose Zone Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1060	1360	1220	4280	2000	1880	1460	Howard et al. 1991 / upper bound measured or estimated value.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Not used (model set to calculate value)
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library
Ground Water Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1060	1360	1220	4280	2000	1880	1460	Howard et al. 1991 / upper bound measured or estimated value.
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
Surface Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	18	24	56	66.5	415	275	33	MacKay et al. 2000 / average of range. Exceptions include ATSDR 2005 (2-Methylnaphthalene, value recorded for Napthalene), USEPA 1998 (7,12-Dimethylbenz(a)anthracene, Benzo(g,h,i)perylene, and Fluoranthene) / average of range, HSDB 2001d (Acenaphthene), HSDB 2001b (Acenaphthylene), and HSDB 2001e (Fluorene).
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	0	0	0	0	0	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Professional judgement.
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library.
Root Zone Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	18	24	56	66.5	415	275	33	Howard et al. 1991 / upper bound measured or estimated value. Exceptions include ATSDR 2005 (2-Methylnaphthalene, value recorded for Napthalene), USEPA 1998 (7,12-Dimethylbenz(a)anthracene, Benzo(g,h,i)perylene, and Fluoranthene) / average of range, HSDB 2001d (Acenaphthene), HSDB 2001b (Acenaphthylene), and HSDB 2001e (Fluorene).
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	0	0	0	0	0	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Professional judgement
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	setting selected for Reference Library
Vadose Zone Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	36	48	112	133	830	550	66	See footnote[a].
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	0	0	0	0	0	0	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Professional judgement
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library
Ground Water Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions.	day	36	48	112	133	830	550	66	See footnote[a].
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L[water]	0	0	0	0	0	0	0	n/a

[a]Howard et al. 1991 / upper bound measured or estimated value. Exceptions include ATSDR 2005 (2-Methylnaphthalene, value recorded for Napthalene), USEPA 1998 (7,12-Dimethylbenz(a)anthracene, Benzo(g,h,i)perylene, and Fluoranthene) / twice average of range, HSDB 2001d (Acenaphthene) / multiplied by 2, HSDB 2001b (Acenaphthylene) / multiplied by 2, and HSDB 2001e (Fluorene) / multiplied by 2.

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
Surface Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3650	3650	3650	3650	3650	3650	3650	Mackay et al. 2000; the degradation rate was cited by multiple authors, value is for 2,3,7,8-TCDD.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	not used (model set to calculate value)
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library.
Root Zone Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3650	3650	3650	3650	3650	3650	3650	Mackay et al. 2000; the degradation rate was cited by multiple authors, value is for 2,3,7,8-TCDD.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	not used (model set to calculate value)
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library.
Vadose Zone Soil Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1008	1008	1008	1008	1008	1008	1008	Average value of the range presented in Mackay et al. 2000; based on estimated unacclimated aerobic biodegradation half-life, value is for 2,3,7,8-TCDD.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	not used (model set to calculate value)
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	Setting selected for Reference Library.
Ground Water Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1008	1008	1008	1008	1008	1008	1008	Average value of the range presented in Mackay et al. 2000; based on estimated unacclimated aerobic biodegradation half-life, value is for 2,3,7,8-TCDD.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

Soil Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Surface Soil Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3650	3650	3650	3650	3650	3650	3650	3650	3650	3650	Mackay et al. 2000; the degradation rate was cited by multiple authors, value is for 2,3,7,8-TCDD.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Not used (model set to calculate value).
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	0	0	0	Setting selected for Reference Library.
Root Zone Soil Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3650	3650	3650	3650	3650	3650	3650	3650	3650	3650	Same as for surface soil compartment type
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Not used (model set to calculate value).
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	0	0	0	Setting selected for Reference Library.
Vadose Zone Soil Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	Average value of the range presented in Mackay et al. 2000; based on estimated unacclimated aerobic biodegradation half-life, value is for 2,3,7,8-TCDD.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
InputCharacteristicDepth_m	Distance from top of the soil compartment at which soil concentration has dropped to 36.79% (1/e * 100%) of the concentration at top of compartment	m	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Not used (model set to calculate value).
UseInputCharacteristicDepth_0_MeansNo_ElseYes	If = 0, use model-calculated characteristic depth, else use user-provided characteristic depth	0 = no, Else = yes	0	0	0	0	0	0	0	0	0	0	Setting selected for Reference Library.
Ground Water Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	Same as for vadose zone soild compartment.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
Surface Water Compartment Type				
AlgaeCarbonContentDryWt	Mass fraction of algae that is carbon (dry wt basis)	unitless	0.465	APHA 1995
AlgaeDensity_g_m3	Mass of algae per unit volume of algae cells, in g/m3	g[algae]/m^3[algae]	1,000,000	Mason et al. 1995b, Mason et al. 1996
AlgaeDensityinWaterColumn_g_L	Mass of algae per unit volume of surface water	g[algae wet wt]/L[water]	0.0025[b]	Millard et al. 1996 as cited in ICF 2005.
AlgaeGrowthRate	First-order rate constant for increase of algae mass per day	1/day	0.7	Hudson et al. 1994, in Watras and Huckabee, eds., as cited in Mason et al. 1995b.
AlgaeRadius	Average radius of algae cell	um	2.5	Mason et al. 1995b.
AlgaeWaterContent	Mass fraction of algae that is water	unitless	0.9	APHA 1995
BoundaryLayerThicknessAboveSediment	Thickness of surface water above sediment within which molecular diffusion between media can be significant (defines boundary between the well mixed portion, where turbulent mixing is rapid and continuous, and the stable portion at the very edge of the interface)	m	0.02	Cal EPA 1993.
ChlorideConcentration_mg_L	Concentration of chloride ion in surface water compartment	mg[chloride]/L[surface water])	8[b]	Kaushal et al. 2005.
ChlorophyllConcentration_mg_L	Concentration of chlorophyll in surface water compartment	mg[chlorophyll]/L[surface water]	0.0029[b]	ICF 2005.
CurrentVelocity[a]	Average speed of moving water in flowing surface water compartments	m/s	unset	Calculated from flow and cross-sectional area.
DimensionlessViscousSublayerThickness	Parameter used in calculating gas- and liquid-phase transfer coefficients, which are used to calculate diffusion from air to surface water and volatilization from surface water to air	unitless	4	Ambrose et al. 1995.
DragCoefficient	Coefficient used to calculate the shear velocity of wind, which is used in calculating volatilization transfers between surface water and air	unitless	0.0011	Ambrose et al. 1995.
Flushes_per_year	Number of times surface water compartment volume is completely turned over (flushed) in a year	1/year	12.17[b]	Calculated based on pond dimensions and flow calculations.
OrganicCarbonContent	Mass fraction of soil or sediment solids that consists of organic carbon	kg[organic carbon]/kg[solids wet wt]	0.02[b]	Professional judgement.
pH	Negative logarithm (base 10) of concentration of hydrogen ion in surface water	unitless	7.3[b]	Professional judgement.
rho	Density (mass per unit volume) of solid materials (e.g., dry soil, dry sediment particles)	kg[solid]/m^3[solid]	2,600	McKone et al. 2001.
SedimentDepositionVelocity	Speed of suspended sediments moving downward through the water column to the sediment bed	m/day	2	U.S. EPA 1997.
SuspendedSedimentconcentration	Total suspended sediments (TSS) concentration (i.e., mass of suspended sediment particles per unit volume water)	kg[sediment]/m^3[water column]	0.05[b]	U.S. EPA 2005a.
Sediment Compartment Type				
OrganicCarbonContent	Mass fraction of soil or sediment solids that consists of organic Carbon.	kg[organic carbon]/kg[solids wet wt]	0.02[b]	McKone et al. 2001 (Table 3).
pH		unitless	7.3[b]	Professional judgement.
rho		kg[sediment]/m^3[sediment]	2,600	McKone et al. 2001 (Table 3).
SedimentResuspensionVelocity		m/day	7.62447E-05[b]	Calculated from water balance model.

[a]Applies to flowing water bodies only (i.e., rivers, streams).
[b]Scenario-specific parameters, values provided are for Tier 1 screenings.

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
Surface Water Compartment Type						
AlgaeUptakeRate	Surface-area-specific rate constant for uptake into algae of a chemical in water	nmol/[µm^2-day-nmol]	0	2.04E-10	3.60E-10	Assumes radius = 2.5mm, Mason et al. 1995b, Mason et al. 1996; Hg(0) assumed same as Hg(2).
D_ow	Weighted (by mass fraction) sum of individual K_ow values for all mercury species present	L[water]/kg[octanol]	0	-[a]	-[b]	Mason et al. 1996.
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.013	Average range of 1E-3 to 2.5E-2/day from Gilmour and Henry 1991.
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	unset	unset	unset	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[water]/kg[solids wet wt]	1,000	100,000	100,000	U.S. EPA 1997.
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	0	0.001	0	Value used in EPA 1997; range is 1E-4 to 3E-4/day (Gilmour and Henry 1991).
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	0	0	Professional judgment.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	0	0.0075	0	Value used in U.S. EPA 1997; reported values range from less than 5E-3/day for depths greater than 17m, up to 3.5/day (Xiao et al. 1995; Vandal et al. 1995; Mason et al. 1995a; Amyot et al. 1997).
VaporDryDepositionVelocity_m_day	Speed at which chemical in vapor form in air moves downward; used in estimating dry deposition and/or diffusion of chemical vapors to soil and surface water	m/day	n/a	2,500	n/a	U.S. EPA 1997 (Vol. III, App. A).
Sediment Compartment Type						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.0501	Average range of 2E-4 to 1E-1/day from Gilmour and Henry 1991.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	unset	unset	unset	n/a
Kd	Equilibrium ratio of concentration sorbed to solids and concentration dissolved	L[water]/kg[solids wet wt]	3,000	50,000	3,000	U.S. EPA 1997.
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	0	1.00E-04	0	Value used in EPA 1997; range is 1E-5 to 1E 3/day, Gilmour and Henry 1991.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	0	0	Professional judgment
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	0	1.00E-06	0	Inferred value based on presence of Hg(0) in sediment porewater (USEPA 1997; Vandal et al. 1995).

[a]TRIM.FaTE Formula Property (calculated, not an input), which variesfrom 0.025 to 1.625 depending on pH and chloride concentration
[b]TRIM.FaTE Formula Property (calculated, not an input), which varies from 0.075 to 1.7 depending on pH and chloride concentration

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
Surface Water Compartment Type				
initialConcentration_g_per_L_ UserSupplied	Initial concentration in the compartment, provided by the user	g/L	0	n/a
RatioOfConcInAlgaeToConc DissolvedInWater	1,000 times the ratio of concentration in algae to the concentration dissolved in surface water. Note: At equilibrium, this property divided by 1,000 equals the bioconcentration factor (BCF).	L[water]/ g[algae wet wt]	1.87	McGeer et al. 2003.
Sediment Compartment Type				
initialConcentration_g_per_m3 _ UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
Surface Water Compartment Type				
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	0	n/a
RatioOfConcInAlgaeToConcDissolvedInWater	1,000 times the ratio of concentration in algae to the concentration dissolved in surface water. Note: At equilibrium, this property divided by 1,000 equals the bioconcentration factor (BCF).	L[water]/g[algae wet wt]	0.155	Mean value from Table 5.5 Crompton 1998.
Sediment Compartment Type				
initialConcentration_g_per_m3_ UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	n/a

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Surface Water Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.138	0.375	90	62.4	1.626	97.8	750	Howard et al. 1991; upper bound measured or estimated value.
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	unset	unset	unset	unset	unset	unset	unset	n/a
RatioOfConcInAlgaeToConcDissolvedInWater	1,000 times the ratio of concentration in algae to the concentration dissolved in surface water. Note: At equilibrium, this property divided by 1,000 equals the bioconcentration factor (BCF).	(g[chem]/kg[algae]) / (g[chem]/L[water])	510	325	317	473	280	1388	1653	Calculated from Kow from Del Vento & Dachs 2002.
Sediment Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	2,290	2,290	2,290	2,290	2,290	2,290	2,290	Mackay et al. 1992 / PAH values are the mean half-life of the log class that Mackay et al. assigned for sediment, except for BbF and IcdP, which were not in Table 2.3 of Mackay et. al.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	unset	unset	unset	unset	unset	unset	unset	n/a

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
Surface Water Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	78	216	25	184	1670	160	8.5	Howard et al. 1991 / upper bound measured or estimated value. Exceptions include HSDB 2005 (2-Methylnaphthalene), HSDB 2001a (7-12 Dimethylbenz(a)anthracene), HSDB 2001d (Acenaphthene), HSDB 2001b (Acenaphthylene), and HSDB 2001c (Benzo(g,h,i)perylene), Montgomery 2000 (Fluoranthene), and Boyle 1985 (Fluorene).
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	Unset	Unset	Unset	Unset	Unset	Unset	Unset	n/a
RatioOfConcInAlgaeToConcDissolvedInWater	1,000 times the ratio of concentration in algae to the concentration dissolved in surface water. Note: At equilibrium, this property divided by 1,000 equals the bioconcentration factor (BCF).	(g[chem]/kg[algae])/(g[chem]/L[water])	2.6	333.4	3	3.7	1539	67.4	5.8	Calculated from Kow from Del Vento and Dachs 2002.
Sediment Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	2290	2290	2290	2290	2290	2290	2290	Mackay et al. 1992 / PAH values are the mean half-life of the log class that Mackay et al. assigned for sediment, except for BbF and IcdP, which were not in Table 2.3 of Mackay et. al.
initialConcentration_g_per_m3_ UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	Unset	Unset	Unset	Unset	Unset	Unset	Unset	n/a

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
Surface Water Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	2.7	2.7	6.3	6.3	6.3	47	0.67	Kim and O'Keefe 1998, as cited in USEPA 2000b.
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	unset	unset	unset	unset	unset	unset	unset	n/a
RatioOfConcInAlgaeToConcDissolvedInWater	1,000 times the ratio of concentration in algae to the concentration dissolved in surface water. Note: At equilibrium, this property divided by 1,000 equals the bioconcentration factor (BCF).	(g[chem]/g [algae])/(g[chem]/L [water])	1.76	1.55	3.88	5.36	5.36	4.54	5.31	Estimated from Kow value using model from DelVento and Dachs 2002
Sediment Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1095	1095	1095	1095	1095	1095	1095	Estimation based on Adriaens and Grbic-Galic 1992,1993 and Adriaens et al. 1995 as cited in U.S. EPA 2000b.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	0	0	0	0	0	0	n/a

Surface Water Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Surface Water Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions.	day	0.18	0.19	0.190	0.58	0.58	0.58	0.58	0.58	0.58	0.58	Kim and O'Keefe 1998, as cited in USEPA 2000b.
initialConcentration_g_per_L_UserSupplied	Initial concentration in the compartment, provided by the user	g/L	unset	unset	unset	unset	unset	unset	unset	unset	unset	unset	n/a
RatioOfConcInAlgaeToConcDissolvedInWater	1,000 times the ratio of concentration in algae to the concentration dissolved in surface water. Note: At equilibrium, this property divided by 1,000 equals the bioconcentration factor (BCF).	(g[chem]/g[algae])/(g[chem]/L[water])	0.71	1.75	1.39	2.06	4.25	3.26	4.26	2.83	1.9	4.54	Estimated from Kow value using model from DelVento and Dachs 2002.
Sediment Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1095	1095	1095	1095	1095	1095	1095	1095	1095	1095	Estimation based on Adriaens and Grbic-Galic 1992,1993 and Adriaens et al. 1995 as cited in U.S. EPA 2000b.
initialConcentration_g_per_m3_UserSupplied	Initial concentration in the compartment, provided by the user	g/m^3	0	0	0	0	0	0	0	0	0	0	n/a

Terrestrial Plant Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Agriculture		Coniferous		Deciduous		Grass/Herb	
			Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference
Leaf Compartment Type										
AttenuationFactor	Effective attenuation by plant leaves of dry depositing particles per unit dry weight of the plant species; used to calculate interception fraction	m^2/kg	2.9	Grass/hay, Baes et al. 1984.	2.9	grass/hay, Baes et al. 1984	2.9	Grass/hay, Baes et al. 1984.	2.9	Grass/hay, Baes et al. 1984.
AverageLeafAreaIndex_No_Time_Dependence	Average one-sided surface area of leaves per unit area surface soil (no time dependence)	m^2[total leaf area]/m^2[underlying soil area]	2	Average for crops (growing season), GLEAMS, North Carolina State University.	5	Harvard Forest, dom. red oak and red maple, CDIAC website.	3.4	Harvard Forest, dom. red oak and red maple, CDIAC website.	5	Professional judgement.
CalculateWetDepInterceptionFraction	Switch used to allow use of user-supplied value or model calculations	true=yes, false=no	true	Setting selected for Reference Library.	true	Setting selected for Reference Library.	true	Setting selected for Reference Library.	true	Setting selected for Reference Library.
CorrectionExponent	Correction exponent for the differences between octanol and lipids	unitless	0.76	From roots, Trapp 1995.	0.76	From roots, Trapp 1995.	0.76	From roots, Trapp 1995.	0.76	From roots, Trapp 1995.
DegreeStomatalOpening	Mean degree of opening of stomatal pores (greater than or equal to 0 and less than or equal to 1)	unitless	1	Set to 1 for daytime based on professional judgment (stomatal diffusion is turned off at night using a different property, IsDay).	1	Set to 1 for daytime based on professional judgment (stomatal diffusion is turned off at night using a different property, IsDay).	1	Set to 1 for daytime based on professional judgment (stomatal diffusion is turned off at night using a different property, IsDay).	1	Set to 1 for daytime based on professional judgment (stomatal diffusion is turned off at night using a different property, IsDay).
LeafWettingFactor	Vegetation-dependent leaf-wetting factor (retention coefficient)	m	3.00E-04	1E-04 to 6E-04 for different crops and elements, Muller and Prohl 1993.	3.00E-04	1E-04 to 6E-04 for different crops and elements, Muller and Prohl 1993	3.00E-04	1E-04 to 6E-04 for different crops and elements, Muller and Prohl 1993.	3.00E-04	1E-04 to 6E-04 for different crops and elements, Muller and Prohl 1993.
LengthofLeaf	Average length of flat leaf	m	0.1	Professional judgment.	0.01	Professional judgment.	0.1	professional judgment	0.05	Professional judgment.
LipidContent	Mass fraction of leaf that is lipid (wet wt basis)	kg[lipid]/kg[leaf wet wt]	0.00224	European beech, Riederer 1995. In Trapp and McFarlane, eds.	0.00224	European beech, Riederer 1995. In Trapp and McFarlane, eds.	0.00224	European beech, Riederer 1995. In Trapp and McFarlane, eds.	0.00224	European beech, Riederer 1995. In Trapp and McFarlane, eds.
LitterFallRate[a]	First-order rate constant for fall of plant leaves (and particles on leaves) to soil (can be made seasonal by setting litter fall start and stop dates)	1/day	unset	n/a	0.0021[b]	see note b	unset	n/a	unset	n/a
StomatalAreaNormalizedEffectiveDiffusionPathLength	Portion of total leaf surface area comprised of stomatal pores divided by the effective path length for a diffusing molecule through a pore; value is relatively similar across plant species	1/m	200	Wilmer and Fricker 1996	200	Wilmer and Fricker 1996	200	Wilmer and Fricker 1996.	200	Wilmer and Fricker 1996.
WaterContent	Mass fraction of leaf that is water (wet wt basis)	kg[water]/kg[leaf wet wt]	0.8	Paterson et al. 1991	0.8	Paterson et al. 1991	0.8	Paterson et al. 1991.	0.8	Paterson et al. 1991.
WetDensity	Density of fresh (i.e., wet) plant leaf	kg[leaf wet wt]/m^3[leaf wet]	820	Paterson et al. 1991	820	Paterson et al. 1991	820	Paterson et al. 1991.	820	Paterson et al. 1991.
WetDepInterceptionFraction_UserSupplied	Fraction of wet deposition intercepted by leaves (input used only if option set)	unitless	0.2	Calculated based on 5 years of local met data, 1987-1991.	0.2	Calculated based on 5 years of local met data, 1987-1991.	0.2	Calculated based on 5 years of local met data, 1987-1991.	0.2	Calculated based on 5 years of local met data, 1987-1991.

Terrestrial Plant Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Agriculture		Coniferous		Deciduous		Grass/Herb	
			Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference
WetMassperArea	Fresh mass of plant part (leaf, root, or stem) per unit surface soil area	kg [plant part wet wt]/ m^2[surface soil]	0.4	Calculated from leaf area index and Leith 1975, in Leith and Whitaker.	2	Calculated from leaf area index, leaf thickness (Simonich & Hites 1994), density of wet foliage.	0.6	n/a	0.6	Calculated from leaf area index and Leith 1975, in Leith and Whitaker.
Particle on Leaf Compartment Type										
VolumeParticlePerAreaLeaf	Volume of leaf particles per unit area of leaf; used to calculate compartment volume	m^3[leaf particles]/m^2[leaf]	1.00E-09	Based on particle density and size distribution for atmospheric particles measured on an adhesive surface, Coe and Lindberg 1987	1.00E-09	Based on particle density and size distribution for atmospheric particles measured on an adhesive surface, Coe and Lindberg 1987.	1.00E-09	Based on particle density and size distribution for atmospheric particles measured on an adhesive surface, Coe and Lindberg 1987	1.00E-09	Based on particle density and size distribution for atmospheric particles measured on an adhesive surface, Coe and Lindberg 1987.
Root Compartment Type - Nonwoody Plants Only[c]										
CorrectionExponent	Correction exponent for the differences between octanol and lipids	unitless	0.76	Trapp 1995; in Trapp and McFarlane, eds.					0.76	Trapp 1995; in Trapp and McFarlane, eds.
LipidContent	Mass fraction of root that is lipid (wet wt basis)	kg[lipid]/kg [root wet wt]	0.011	From bean root, Trapp 1995; in Trapp and McFarlane, eds.					0.011	From bean root, Trapp 1995; in Trapp and McFarlane, eds.
WaterContent	Mass fraction of root that is water (wet wt basis)	kg[water]/kg[root wet wt])	0.8	Professional judgment.					0.8	Professional judgment.
WetDensity	Density of fresh (i.e., wet) plant root.	kg[root wet wt]/m^3[root wet]	820	Soybean, Paterson et al. 1991.					820	Soybean, Paterson et al. 1991.
WetMassperArea	Fresh mass of plant part (leaf, root, or stem) per unit surface soil area	kg[plant part wet wt]/m^2[surface soil]	0.15	Temperate grassland, Jackson et al. 1996.					1.4	Temperate grassland, Jackson et al. 1996.
Stem Compartment Type - Nonwoody Plants Only[c]										
CorrectionExponent	Correction exponent for the differences between octanol and lipids	unitless	0.76	From roots, Trapp 1995; in Trapp and McFarlane, eds.					0.76	From roots, Trapp 1995; in Trapp and McFarlane, eds.
FlowRateofTranspiredWaterperAreaofLeafSurface	Flow rate of transpired water per leaf area	m^3[water]/m^2 [stem]-day	0.0048	Crank et al. 1981, in Paterson et al. 1991.					0.0048	Crank et al. 1981, in Paterson et al. 1991.
FractionPhloemRatewithTranspirationFlowRate	Fraction of transpiration flow rate that is phloem rate	unitless	0.05	Paterson et al. 1991.					0.05	Paterson et al. 1991.
LipidContent	Mass fraction of stem that is lipid (wet wt basis)	kg[lipid]/kg[stem wet wt]	0.00224	Leaves of European beech, Riederer 1995. In Trapp and McFarlane, eds.					0.00224	Leaves of European beech, Riederer 1995. In Trapp and McFarlane, eds.
PhloemDensity	Density of phloem fluid	kg[phloem]/m^3[phloem]	1,000	Professional judgment.					1,000	Professional judgment.
WaterContent	Mass fraction of stem that is water (wet wt basis)	kg[water]/kg[l stem wet wt]	0.8	Paterson et al. 1991.					0.8	Paterson et al. 1991.
WetDensity	Density of fresh (i.e., wet) plant stem.	kg[stem wet wt]/m^3[stem wet]	830	professional judgment					830	Professional judgment.
WetMassperArea	Fresh mass of plant part (leaf, root, or stem) per unit surface soil area	kg[plant part wet wt]/m^2[surface soil]	0.16	Calculated from leaf and root biomass density based on professional judgment.					0.24	Calculated from leaf and root biomass density based on professional judgment.
XylemDensity	Density of xylem fluid	kg[xylem fluid]/m^3[xylem fluid]	900	Professional judgment.					900	Professional judgment.

[a]Can be made to vary seasonally (scenario-specific).
[b]Value assumes first-order relationship and that 99 percent of leaves fall in six years.
[c]Roots and stems are not modeled for deciduous or coniferous forest in the current.

Terrestrial Plant Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
Leaf Compartment Type						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.03	Calculated from Bache et al. 1973.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	unset	unset	unset	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	Assumed from Gay 1975, Bache et al. 1973
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	1.0E+06	n/a	n/a	Professional judgement; assumed close to instantaneous.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	Professional judgment.
TransferFactortoLeafParticle	First-order rate constant for chemical transfer from leaf to leaf particle	1/day	0.002	0.002	0.002	Assumed based on 1% of transfer factor from leaf particle to leaf.
Particle on Leaf Compartment Type						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0	Professional judgment.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	unset	unset	unset	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	Professional judgment.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	n/a	n/a	Professional judgment.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	Professional judgment.
TransferFactortoLeaf	First-order rate constant for chemical transfer from leaf particle to leaf	1/day	0.2	0.2	0.2	Professional judgment.
Root Compartment Type - Nonwoody Plants Only[b]						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0	Professional judgment.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	unset	unset	unset	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	Professional judgment.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	n/a	n/a	Professional judgment.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	Professional judgment.

Terrestrial Plant Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
Root_RootZonePartitioningBulkSoil_AlphaofSteadyState	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	Professional judgement.
Root_RootZonePartitioningBulkSoil_PartitionCoefficient	Equilibrium ratio of concentration in root to concentration in bulk (i.e., wet) root zone soil	m^3[bulk root soil]/m^3[root]	0	0.18	1.2	Hg2- geometric mean Leonard et al. 1998, John 1972, Hogg et al. 1978; MHg- assumed, based on Hogg et al. 1978.
Root_RootZonePartitioningBulkSoil_TimetoReachAlphaofSteadyState	Time to reach 100 x alpha percent of equilibrium	day	21	21	21	Professional judgment.
RootSoilWaterInteraction_Alpha	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	Selected value.
Stem Compartment Type - Nonwoody Plants Only[b]						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.03	Calculated from Bache et al. 1973.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	unset	unset	unset	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	Professional judgment.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	0	n/a	n/a	Professional judgement.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	Professional judgment.
TSCF	Transpiration stream concentration factor; the ratio of concentration dissolved in xylem fluid to concentration dissolved in soil pore water	m^3[soil pore water]/m^3[xylem fluid]	0	0.5	0.2	Calculation from Norway spruce, Scots pine, Bishop et al. 1998.

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[b]Roots and stems are not modeled for deciduous or coniferous forest in the current version of TRIM.FaTE.

Terrestrial Plant Compartment Types[a]

Parameter Name	Units	Value	Reference
Leaf Compartment Type			
Transfer factor to leaf particle	1/day	0.002	Professional judgment (assumed 1% of transfer factor from leaf particle to leaf).
Particle on Leaf Compartment Type			
Transfer factor to leaf	1/day	0.2	Professional judgement.
Root Compartment Type - Grasses and Herbs[b]			
Root to Root Soil Partition- Alpha of Steady State	unitless	0.95	Henning et al. 2001.
Root to Root Soil Partition- Partitioning Coefficient	m^3[bulk soil]/m^3[root]	0.23	Nriagu 1980; based on average value calculated from various agricultural plant species.
Root to Root Soil Partition- Time to Reach Alpha	day	28	Henning et al. 2001.
Stem Compartment Type - Grasses and Herbs[b]			
Transpiration stream concentration factor (TSCF)	m^3[soil pore water]/m^3[xylem fluid]	0.45	Tsiros et al. 1999.

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Terrestrial Plant Compartment Types[a]

Parameter Name	Units	Value	Reference
Leaf Compartment Type			
Transfer factor to leaf particle	1/day	0.002	Professional judgment (assumed 1% of transfer factor from leaf particle to leaf).
Particle on Leaf Compartment Type			
Transfer factor to leaf	1/day	0.2	Professional judgement.
Root Compartment Type - Grasses and Herbs[b]			
Root to Root Soil Partition- Alpha of Steady State	unitless	0.95	Henning et al. 2001.
Root to Root Soil Partition- Partitioning Coefficient	m^3[bulk soil]/m^3[root]	0.05	Bergqvist 2013
Root to Root Soil Partition- Time to Reach Alpha	day	10	Iriel, 2015
Stem Compartment Type - Grasses and Herbs[b]			
Transpiration stream concentration factor (TSCF)	m^3[soil pore water]/m^3[xylem fluid]	0.24	Zhao, 2008

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Terrestrial Plant Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Leaf Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3.50	3.50	3.50	3.50	3.50	3.50	3.50	Approximated based on data from Edwards, N.T. 1988. In M. Cooke and A.J. Dennis, eds., and unpublished research (McKone 1997).
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeaf Particle	First-order rate constant for chemical transfer from leaf to leaf particle	1/day	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	Professional judgment.
Particle on Leaf Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	2.31	1.84	3.56	17.80	4.12	17.80	17.80	Calculated as 2 times the measured photolysis half-life from Mackay et al. 1992.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeaf	First-order rate constant for chemical transfer from leaf particle to leaf	1/day	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	Professional judgment.
Root Compartment Type – Grasses and Herbs[b]										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	34.60	34.60	34.60	34.60	34.60	34.60	34.60	Approximated based on data from Edwards, N.T. 1988. In M. Cooke and A.J. Dennis, eds.; for bush beans in nutrient solution.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
RootSoilWaterInteraction_Alpha	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Assumption.
Stem Compartment Type – Grasses and Herbs[b]										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3.50	3.50	3.50	3.50	3.50	3.50	3.50	Approximated based on data from Edwards, N.T. 1988. In M. Cooke and A.J. Dennis, eds.; for bush beans in nutrient solution.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

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[b]Roots and stems are not modeled for deciduous or coniferous forest in the current version of TRIM.FaTE.

Terrestrial Plant Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
Leaf Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3.5	3.5	3.5	3.5	3.5	3.5	3.5	Approximated based on data from Edwards, N.T. 1988. In M. Cooke and A.J. Dennis, eds., and unpublished research (McKone 1997).
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeaf Particle	First-order rate constant for chemical transfer from leaf to leaf particle	1/day	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	Professional judgement.
Particle on Leaf Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	2.31	2.31	2.31	2.31	2.31	2.31	2.31	Calculated as 2 times the measured photolysis half-life from Mackay et al. 1992. Exceptions include values that have been set equal to Benzo(a)pyrene (2-Methylnaphthalene; 7,12-Dimethylbenz(a)anthracene; Acenaphthene; Acenaphthylene; Benzo(ghi)perylene; Fluoranthene; and Fluorene).
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeaf	First-order rate constant for chemical transfer from leaf particle to leaf	1/day	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	Professional judgement.
Root Compartment Type – Grasses and Herbs[b]										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	34.6	34.6	34.6	34.6	34.6	34.6	34.6	Approximated based on data from Edwards, N.T. 1988. In M. Cooke and A.J. Dennis, eds.; for bush beans in nutrient solution.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
RootSoilWaterInteraction_Alpha	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Selected value.
Stem Compartment Type – Grasses and Herbs[b]										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3.5	3.5	3.5	3.5	3.5	3.5	3.5	Approximated based on data from Edwards, N.T. 1988. In M. Cooke and A.J. Dennis, eds.; for bush beans in nutrient solution.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

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Terrestrial Plant Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
Leaf Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba et al. 1995, in Trapp and Mc Farlane,eds; soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeafParticle	First-order rate constant for chemical transfer from leaf to leaf particle	1/day	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	Calculated as 1 percent of transfer factor to leaf; highly uncertain.
Particle on Leaf Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	4.4	4.4	4.4	4.4	4.4	4.4	4.4	McCrady and Maggard 1993; photodegradation sorbed to grass foliage in sunlight; assumed 10% sunlight per day.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeaf	First-order rate constant for chemical transfer from leaf particle to leaf	1/day	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	Assumption based on U.S. EPA 2000c (an estimate for mercury) and Trapp 1995; highly uncertain.
Root Compartment Type[b]										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba et al. 1995, in Trapp and Mc Farlane,eds; soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
RootSoilWaterInteraction_Alpha	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Assumption.
Stem Compartment Type[b]										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba et al. 1995, in Trapp and Mc Farlane,eds; soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

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[b]Roots and stems are not modeled for deciduous or coniferous forest in the current version of TRIM.FaTE.

Terrestrial Plant Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Leaf Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba et al. 1995, in Trapp and Mc Farlane,eds; soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeafParticle	First-order rate constant for chemical transfer from leaf to leaf particle	1/day	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	Calculated as 1 percent of transfer factor to leaf; highly uncertain.
Particle on Leaf Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	McCrady and Maggard 1993; photodegradation sorbed to grass foliage in sunlight; assumed 10% sunlight per day.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
TransferFactortoLeaf	First-order rate constant for chemical transfer from leaf particle to leaf	1/day	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	Assumption based on USEPA 2000c (an estimate for mercury) and Trapp 1995; highly uncertain.
Root Compartment Type[b]													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba et al. 1995, in Trapp and Mc Farlane,eds; soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
RootSoilWaterInteraction_Alpha	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Assumption.
Stem Compartment Type[b]													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba et al. 1995, in Trapp and Mc Farlane,eds; soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

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Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
Macrophyte Compartment Type				
BiomassPerArea_kg_m2	Mass of macrophytes per unit surface water area (wet wt basis)	kg/m^2	0.6	Bonar et al. 1993.
Density	Mass of plant matter (wet weight) per unit volume of plant	kg[wet wt]/L	1	Professional judgment.

Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
Macrophyte Compartment Type						
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	unset	unset	unset	n/a
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	1.00E+09	n/a	n/a	Professional judgment.
WaterColumnDissolvedPartitioning_AlphaofEquilibrium	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	Selected value.
WaterColumnDissolvedPartitioning_PartitionCoefficient	Equilibrium ratio of concentration in macrophyte to concentration dissolved in water	L[water]/kg[macrophyte wet wt]	0.883	0.883	4.4	*Elodea densa,* Ribeyre and Boudou 1994.
WaterColumnDissolvedPartitioning_TimeToReachAlphaofEquilibrium	Time to reach 100 x alpha percent of equilibrium	day	18	18	18	Experiment duration from Ribeyre and Boudou 1994.

Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
Macrophyte Compartment Type				
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0	n/a
WaterColumnDissolvedPartitioning_AlphaofEquilibrium	Proportion of equilibrium value reached	unitless	0.95	Maine et al. 2001 (based on assumption that equilibrium was nearly reached during 21 day experiment).
WaterColumnDissolvedPartitioning_PartitionCoefficient	Equilibrium ratio of concentration in macrophyte to concentration dissolved in water	L[water]/kg[macrophyte wet wt]	100	Maine et al. 2001 (based on calculations from an average of four macrophyte species).
WaterColumnDissolvedPartitioning_TimeToReachAlphaofEquilibrium	Time to reach 100 x alpha percent of equilibrium	day	21	Maine et al. 2001

Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value	Reference
Macrophyte Compartment Type				
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user.	g/kg	0	n/a
WaterColumnDissolvedPartitioning_AlphaofEquilibrium	Proportion of equilibrium value reached.	unitless	0.95	Maine et al. 2001 (based on assumption that equilibrium was nearly reached during 21 day experiment).
WaterColumnDissolvedPartitioning_PartitionCoefficient	Equilibrium ratio of concentration in macrophyte to concentration dissolved in water.	L[water]/kg[macrophyte wet wt]	0	n/a
WaterColumnDissolvedPartitioning_TimeToReachAlphaofEquilibrium	Time to reach 100 x alpha percent of Equilibrium.	day	21	Maine et al. 2001

Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Macrophyte Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3.5	3.5	3.5	3.5	3.5	3.5	3.5	Edwards 1988, in Cooke and Dennis,eds., as cited in Efroymson, 1997; calculated from metabolic rate constant.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
Macrophyte Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	3.5	3.5	3.5	3.5	3.5	3.5	3.5	Edwards 1988, in Cooke and Dennis,eds., as cited in Efroymson, 1997; calculated from metabolic rate constant.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0	0	0	0	0	0	0	n/a

Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
Macrophyte Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba, et al. 1995, in Trapp and Mc Farlane,eds. Soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

Aquatic Plant Compartment Type

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Macrophyte Compartment Type													
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Arjmand and Sandermann 1985, as cited in Komoba, et al. 1995, in Trapp and Mc Farlane,eds. Soybean root cell culture metabolism test data for DDE.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
Soil Detritivore Compartment Type - Earthworm				
ArealDensity_Freshweight	Mass of worm per unit surface area of soil, deciduous.	kg[worm wet wt]/m^2[soil]	unset	n/a
Density_Freshweight	Density of worm (wet wt basis); used to calculate compartment volume.	kg[worm wet wt]/L[worm]	1	professional judgment
Water_content	Mass fraction of worm that is water.	unitless	0.84	U.S. EPA 1993
Soil Detritivore Compartment Type - Soil Arthropod				
BiomassPerArea_kg_m2	Mass of macrophytes per unit surface water area (wet wt basis).	kg[arthropod wet wt]/m^2[soil]	3.01E-04	grasshopper, Porter et al. 1996
BW	Fresh body weight of individual animal (i.e., wet weight).	kg	1.31E-04	grasshopper, Porter et al. 1996
FractionPartitionwithSurfSoil	Fraction of total partitioning between arthropod and soil that occurs with surface soil (remainder with root zone soil).	unitless	1.00E+00	n/a

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Terrestrial Carnivore - Long-tailed Weasel		Terrestrial Carnivore - Red-tailed hawk		Terrestrial Ground-Invertebrate Feeder - Short-tailed Shrew		Terrestrial Ground-Invertebrate Feeder - Trowbridge Shrew		Terrestrial Herbivore - Long-tailed Vole	
			Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference
	All Other Terrestrial Animal Compartment Types											
BW	Fresh body weight of individual animal (i.e., wet weight)	kg	0.147	Mumford and Whitaker 1982	1.13	North America, Dunning 1993	0.022	0.015-0.029 kg reported for Manitoba, Silva and Downing 1995	0.00449	Silva and Downing 1995	0.0467	Smolen and Keller 1987
FoodIngestionRate[a]	Total amount of food eaten per day, normalized to body weight	kg[diet wet wt]/kg[body wet wt]-day	0.0735	calc from Brown and Lasiewski 1972, Golley 1961, U.S. EPA 1993	0.12	Preston and Beane 1993	0.47	Barrett and Stueck 1976	1.17	Rust 1978	0.097	mean Microtus spp., Dark et al. 1983, Burt and Grossenheider 1976, Dice 1922
FractionDietChickadee	Fraction of diet comprised of black-capped chickadee	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietMouse	Fraction of diet comprised of mouse	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietPlant	Fraction of diet comprised of terrestrial plant	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietshorttailedshrew	Fraction of diet comprised of short-tailed shrew	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietSoilArthropod	Fraction of diet comprised of soil arthropod	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietvole	Fraction of diet comprised of vole	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietWorm	Fraction of diet comprised of worm	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionExcretiontoSoil	Fraction of total wildlife elimination in urine and feces that goes to surface soil	unitless	1	professional judgment	1	professional judgment	1	professional judgment	1	professional judgment	1	professional judgment
FractionExcretiontoWater	Fraction of total wildlife elimination in urine and feces that goes to surface water	unitless	0	professional judgment	0	professional judgment	0	professional judgment	0	professional judgment	0	professional judgment
InhalationProps_A	Allometric scaling constant used to calculate inhalation rate based on body weight	unitless	0.546	Stahl 1967	0.409	Lasiewski and Calder 1971	0.546	Stahl 1967	0.546	Stahl 1967	0.546	Stahl 1967
InhalationProps_B	Allometric scaling constant used to calculate inhalation rate based on body weight	unitless	0.8	Stahl 1967	0.8	Lasiewski and Calder 1971	0.8	Stahl 1967	0.8	Stahl 1967	0.8	Stahl 1967
NumberofIndividualsPerSquareMeter	Number of individuals per unit surface area	$\#/m^2$	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
SoilFractionofDryDiet	Fraction of total dry wt intake comprised of soil. When UseSoilFractionofDryDietToCalculateSoilIngestionRate is set to TRUE, this property is used to calculate soil ingestion rate.	unitless, dry wt basis	0	professional judgment	0	professional judgment	0	not used; user input available for soil ingestion rate	0.13	Talmage and Walton 1993	0.024	Beyer et al. 1994
SoilIngestionRate_UserSupplied	Total amount of soil eaten per day by birds or mammals, normalized to body weight (calculated from value for FractionDiet_Soil (dry wt basis) and food ingestion rate)	kg[soil dry wt]/kg[body wet wt]-day	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0.0611	Talmage and Walton 1993	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)
UseSoilFractionofDryDietToCalculateSoilIngestionRate	Specifies whether to use calculated or user-supplied soil ingestion rate. If true, SoilIngestionRate is calculated based on SoilFractionofDryDiet. If false, SoilIngestionRate is user-supplied.	true=yes, false=no	true	set to calculate 0	true	set to calculate 0	false	user input available	true	user input not available	true	user input not available
WaterIngProps_A	Allometric scaling constant used to calculate water ingestion rate based on body weight	unitless	0.099	Calder and Braun 1983	0.059	Calder and Braun 1983	0.099	Calder and Braun 1983	0.099	Calder and Braun 1983	0.099	Calder and Braun 1983
WaterIngProps_B	Allometric scaling constant used to calculate water ingestion rate based on body weight	unitless	0.9	Calder and Braun 1983	0.67	Calder and Braun 1983	0.9	Calder and Braun 1983	0.9	Calder and Braun 1983	0.9	Calder and Braun 1983

[a]See Attachment 1 for documentation of food ingestion rate calculations.

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Terrestrial Herbivore - Meadow Vole		Terrestrial Herbivore - Mule Deer/Black-tailed Deer		Terrestrial Herbivore - White-tailed Deer		Terrestrial Insectivore - Black-capped Chickadee		Terrestrial Omnivore - Mouse	
			Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference
All Other Terrestrial Animal Compartment Types												
BW	Fresh body weight of individual animal (i.e., wet weight)	kg	0.0441	Reich 1981	66.2	Colorado, Alldredge et al. 1974	74.8	Silva and Downing 1995	0.0108	Dunning 1993	0.02	North America, Silva and Downing 1995
FoodIngestionRate	Total amount of food eaten per day, normalized to body weight	kg[diet wet wt]/kg[body wet wt]-day	0.097	mean Microtus spp., Dark et al. 1983, Burt and Grossenheider 1976, Dice 1922	0.11	estimated for mule deer from Alldredge et al. 1974	0.05	Mautz et al. 1976	0.74	calculated from Bell 1990, Dunning 1993	0.2	Green and Millar 1987
FractionDietChickadee	Fraction of diet comprised of black-capped chickadee	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietMouse	Fraction of diet comprised of mouse	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietPlant	Fraction of diet comprised of terrestrial plant	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietshorttailedshrew	Fraction of diet comprised of short-tailed shrew	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietSoilArthropod	Fraction of diet comprised of soil arthropod	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietvole	Fraction of diet comprised of vole	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietWorm	Fraction of diet comprised of worm	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionExcretiontoSoil	Fraction of total wildlife elimination in urine and feces that goes to surface soil	unitless	1	professional judgment	1	professional judgment	1	professional judgment	1	professional judgment	1	professional judgment
FractionExcretiontoWater	Fraction of total wildlife elimination in urine and feces that goes to surface water	unitless	0	professional judgment	0	professional judgment	0	professional judgment	0	professional judgment	0	professional judgment
InhalationProps_A	Allometric scaling constant used to calculate inhalation rate based on body weight	unitless	0.546	Stahl 1967	0.546	Stahl 1967	0.546	Stahl 1967	0.409	Lasiewski and Calder 1971	0.546	Stahl 1967
InhalationProps_B	Allometric scaling constant used to calculate inhalation rate based on body weight	unitless	0.8	Stahl 1967	0.8	Stahl 1967	0.8	Stahl 1967	0.8	Lasiewski and Calder 1971	0.8	Stahl 1967
NumberofIndividualsPerSquareMeter	Number of individuals per unit surface area	$\#/m^2$	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
SoilFractionofDryDiet	Fraction of total dry wt intake comprised of soil. When UseSoilFractionofDryDietToCalculateSoilIngestionRate is set to TRUE, this property is used to calculate soil ingestion rate.	unitless, dry wt basis	0.024	Beyer et al. 1994	0.02	north central Colorado, Arthur and Alldredge 1979	0.01	Beyer et al. 1994	0	assumed, rarely observed on ground, Smith 1993	0.02	Beyer et al. 1994
SoilIngestionRate_UserSupplied	Total amount of soil eaten per day by birds or mammals, normalized to body weight (calculated from value for FractionDiet_Soil (dry wt basis) and food ingestion rate)	kg[soil dry wt]/kg[body wet wt]-day	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)
UseSoilFractionofDryDietToCalculate	Specifies whether to use calculated or user-supplied soil ingestion rate. If true, SoilIngestionRate is calculated based on SoilFractionofDryDiet. If false, SoilIngestionRate is user-supplied.	true=yes, false=no	true	user input not available	true	user input not available	true	user input not available	true	set to calculate 0	true	user input not available
WaterIngProps_A	Allometric scaling constant used to calculate water ingestion rate based on body weight	unitless	0.099	Calder and Braun 1983	0.099	Calder and Braun 1983	0.099	Calder and Braun 1983	0.059	Calder and Braun 1983	0.099	Calder and Braun 1983
WaterIngProps_B	Allometric scaling constant used to calculate water ingestion rate based on body weight	unitless	0.9	Calder and Braun 1983	0.9	Calder and Braun 1983	0.9	Calder and Braun 1983	0.67	Calder and Braun 1983	0.9	Calder and Braun 1983

[a]See Attachment 1 for documentation of food ingestion rate calculations.

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
Soil Detritivore - Earthworm						
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	n/a
WormSoilPartitionCoefficient_dryweight	Equilibrium ratio of concentration in earthworm to concentration in soil (dry wt basis)	kg[soil dry wt]/kg[worm dry wt]	0.36	0.36	0.36	Bull et al. 1977
WormSoilInteraction_alpha	Proportion of equilibrium value reached for earthworn to bulk soil transfer	unitless	0.95	0.95	0.95	selected value
WormSoilInteraction_t_alpha	Time to reach 100 x alpha percent of equilibrium for earthworn to bulk soil transfer	day	21	21	21	assumed same as metals in earthworms, Janssen et al. 1997
Soil Detritivore - Soil Arthropod						
Arthropod_SoilPartitionCoefficient	Equilibrium ratio of concentration of chemical in arthropod (wet wt basis) to concentration in bulk soil (wet wt basis)	kg[soil wet wt]/kg[arthropod wet wt])	0	0.46	2.9	Hg(2) - median from Talmage and Walton 1993; MHg - median from Nuorteva and Nuorteva 1982
ArthropodSoilPartitioning_AlphaofEquilibrium	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	selected value
ArthropodSoilPartitioning_TimetoReachAlphaofEquilibrium	Time to reach 100 x alpha percent of equilibrium for earthworn to bulk soil transfer	day	21	21	21	assumed same as metals in earthworms, Janssen et al. 1997
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	n/a
All Other Terrestrial Animal Compartment Types[a]						
AssimilationEfficiencyFromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.09	for rats, Takeda and Ukita 1970
InhalationAssimilationEfficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	0.75	0.4	0.75	Hg(0) - based on human values, ATSDR 1997, Teisinger and Fiserova-Bergerova 1965; Hg(2) - based on dog value, U.S. EPA 1997; MHg - assumed same as Hg(0)
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	professional judgment
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	1	n/a	n/a	professional judgment
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	professional judgment
TotalExcretionRate	First-order rate constant for elimination of chemical from the body (in urine, feces, feathers, fur)	1/day	0.05	0.48	0.086	see Attachment 2 for documentation

[a]TRIM.FaTE Reference Library includes Terrestrial Carnivore - Red-tailed Hawk, Terrestrial Insectivore - Black-capped Chickadee, Terrestrial Carnivore - Long-tailed Weasel, Terrestrial Ground - Invertebrate Feede Short-tailed Shrew, Terrestrial Ground-Invertebrate Feeder - Trowbridge Shrew, Terrestrial Herbivore - Long-tailed Vole, Terrestrial Herbivore - Meadow Vole, Terrestrial Herbivore - Mule Deer/Black-tailed Deer, Terrestrial Herbivore - White-tailed Deer, and Terrestrial Omnivore - Mouse

[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not absorbed) dose, hence assimilation efficiency must equal

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Soil Detritivore - Earthworm										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	61	61	61	61	61	61	61	Ma et al. 1995; estimated from fluoranthene bioaccumulation curve
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
WormSoilWaterInteraction_alpha	Proportion of equilibrium value reached for earthworn to soil pore water transfer	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	selected value
WormSoilWaterInteraction_t_alpha	Time to reach 100 x alpha percent of equilibrium for earthworn to soil pore water transfer	day	28	28	28	28	28	28	28	professional judgment
Soil Detritivore - Soil Arthropod										
Arthropod_SoilPartitionCoefficient	Equilibrium ratio of concentration of chemical in arthropod (wet wt basis) to concentration in bulk soil (wet wt basis)	(kg[soil wet wt]/kg[arthropod wet wt])	1.26E-02	1.51E-02	5.74E-03	1.19E-02	1.62E-02	1.26E-02	1.26E-02	geometric mean of data for three isopod species BAFs in litter, fragmentation and humus soils in van Brummelen and van Straalen 1996
ArthropodSoilPartitioning_AlphaofEquilibrium	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	selected value
ArthropodSoilPartitioning_TimetoReachAlphaofEquilibrium	Time to reach 100 x alpha percent of equilibrium	day	28	28	28	28	28	28	28	no data found; used phenanthrene accumulation data for earthworms in Ma et al. 1995
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.6	0.6	0.6	0.6	0.6	0.6	0.6	van Brummelen and van Straalen 1996; model estimate from data in *Porcellio scaber*
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
All Other Terrestrial Animal Compartment Types[a]										
AssimilationEfficiencyFromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
InhalationAssimilationEfficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	professional judgment, assuming inhalation rate in model is total rate, not alveolar rate
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a

[a]TRIM.FaTE Reference Library includes Terrestrial Carnivore - Long-tailed Weasel, Terrestrial Carnivore - Red-tailed Hawk, Terrestrial Ground - Invertebrate Feeder - Short-tailed Shrew, Terrestrial Ground-Invertebrate Feeder - Trowbridge Shrew, Terrestrial Herbivore - Long-tailed Vole, Terrestrial Herbivore - Meadow Vole, Terrestrial Herbivore - Mule Deer/Black-tailed Deer, Terrestrial Herbivore - White-tailed Deer, Terrestrial Insectivore - Black-capped Chickadee, and Terrestrial Omnivore - Mouse.

[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not absorbed) dose, hence assimilation efficiency must equal 1.

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
Soil Detritivore - Earthworm										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	140	100	330	330	330	250	650	estimated based on data for yellow perch in Kleeman et al. 1986.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
WormSoilPartitionCoefficient_dryweight	Equilibrium ratio of concentration in earthworm to concentration in soil (dry wt basis)	kg[dry soil]/kg[dry worm]	1.99E+00	1.83E+00	6.10E-01	2.40E-01	2.80E-01	1.00E-01	2.00E-02	U.S. EPA 1999; recommended soil-to-soil invertebrate BCF (dry wt soil/wet wt worm) based on measured data for TCDD, converted value to wet wt soil/wet wt worm assuming 20% as fraction water content.
WormSoilWaterInteraction_alpha	Proportion of equilibrium value reached for earthworn to bulk soil transfer	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	selected value
WormSoilWaterInteraction_t_alpha	Time to reach 100 x alpha percent of equilibrium for earthworn to bulk soil transfer	day	50	50	50	50	50	50	50	Reinecke and Nash 1984; measured for TCDD
Soil Detritivore - Soil Arthropod										
Arthropod_SoilPartitionCoefficient	Equilibrium ratio of concentration of chemical in arthropod (wet wt basis) to concentration in bulk soil (wet wt basis)	(kg[soil wet wt]/kg[arthropod wet wt])	1.26E-02	1.51E-02	5.74E-03	1.19E-02	1.62E-02	1.26E-02	1.26E-02	geometric mean of data for three isopod species BAFs in litter, fragmentation and humus soils in van Brummelen and van Straalen 1996
ArthropodSoilPartitioning_AlphaofEquilibrium	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	selected value
ArthropodSoilPartitioning_TimetoReachAlphaofEquilibrium	Time to reach 100 x alpha percent of equilibrium	day	28	28	28	28	28	28	28	no data found; used phenanthrene accumulation data for earthworms in Ma et al. 1995
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	140	100	330	330	330	250	650	estimated based on data for yellow perch in Keeman et al. 1986b
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
Terrestrial Bird Compartment Types[a]										
AssimilationEfficiencyFromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	0.58	0.58	0.58	0.58	0.58	0.58	0.58	Noseck et al. 1992; TCDD data for ring-necked pheasant
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	0.33	0.33	0.33	0.33	0.33	0.33	0.33	Noseck et al. 1992; TCDD data for ring-necked pheasant
AssimilationEfficiencyFromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Noseck et al. 1992; TCDD data for ring-necked pheasant

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
InhalationAssimilationEfficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1	1	0.9	0.9	0.9	0.8	0.8	Based on rat transpulmonary absorption data for TCDD published in Nessel et al. 1990, Nessel et al. 1992, and Diliberto et al., 1996 (as cited in U.S. EPA 2000c); professional judgment was used to scale HxCDD, HpCDD, and OCDD lower due to lower water solubility and large MW
initialConcentration_g_per_kg_User Supplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
Terrestrial Mammal Compartment Types[c]										
AssimilationEfficiencyFromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
AssimilationEfficiencyFromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	set to 1[b]
InhalationAssimilationEfficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1	1	0.9	0.9	0.9	0.8	0.8	Professional judgment, assuming inhalation rate in model is total rate, not alveolar rate
initialConcentration_g_per_kg_User Supplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a

[a]TRIM.FaTE Reference Library includes Terrestrial Carnivore - Red-tailed Hawk, and Terrestrial Insectivore - Black-capped Chickadee.
[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not
[a]TRIM.FaTE Reference Library includes Terrestrial Carnivore - Long-tailed Weasel, Terrestrial Ground - Invertebrate Feeder - Short-tailed Shrew,

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF
Soil Detritivore - Earthworm										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	140	100	100	330	330	330	330	250
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WormSoilPartitionCoefficient_dryweight	Equilibrium ratio of concentration in earthworm to concentration in soil (dry wt basis)	kg[dry soil]/kg[dry worm]	1.59E+00	4.00E-01	3.18E+00	1.50E-01	3.80E-01	1.25E+00	1.34E+00	2.00E-02
WormSoilWaterInteraction_alpha	Proportion of equilibrium value reached for earthworn to bulk soil transfer	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
WormSoilWaterInteraction_t_alpha	Time to reach 100 x alpha percent of equilibrium for earthworn to bulk soil transfer	day	50	50	50	50	50	50	50	50
Soil Detritivore - Soil Arthropod										
Arthropod_Soil PartitionCoefficient	Equilibrium ratio of concentration of chemical in arthropod (wet wt basis) to concentration in bulk soil (wet wt basis)	(kg[soil wet wt]/ kg[arthropod wet wt])	1.59E+00	4.00E-01	3.18E+00	1.50E-01	3.80E-01	1.25E+00	1.34E+00	2.00E-02
ArthropodSoilPartitioning_ AlphaofEquilibrium	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
ArthropodSoilPartitioning_TimetoReachAlphaof Equilibrium	Time to reach 100 x alpha percent of equilibrium	day	50	50	50	50	50	50	50	50
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	140	100	100	330	330	330	330	250
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Terrestrial Bird Compartment Types[a]										
AssimilationEfficiency FromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
AssimilationEfficiency FromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
AssimilationEfficiency FromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
AssimilationEfficiency FromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
InhalationAssimilationEfficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Terrestrial Mammal Compartment Types[c]										
AssimilationEfficiency FromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
AssimilationEfficiency FromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
AssimilationEfficiency FromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
AssimilationEfficiency FromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1
InhalationAssimilation Efficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1	1	1	0.9	0.9	0.9	0.9	0.8
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a]TRIM.FaTE Reference Library includes Terrestrial Carnivore - Red-tailed Hawk, and Terrestrial Insectivore - Black-capped Chickadee

[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not absorbed) dose, hence assimilation efficiency must equal 1

[a]TRIM.FaTE Reference Library includes Terrestrial Carnivore - Long-tailed Weasel, Terrestrial Ground - Invertebrate Feeder - Short-tailed Shrew, Terrestrial Ground-Invertebrate Feeder - Trowbridge Shrew, Terrestri Deer/Black-tailed Deer, Terrestrial Herbivore - White-tailed Deer, and Terrestrial Omnivore - Mouse.

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	Reference
Soil Detritivore - Earthworm			
Halflife	250	400000	TCDF: used TCDD data; HxCDF and HpCDF: used HxCDD and HpCDD data; OCDF: Clark and Mackay 1991; metabolism of OCDF in guppy; PeCDF: Sijm et al. 1990 quoted elimination rate for carp, metabolic rate calculated assuming 9% metabolites like hepta and hexa isomers as cited in Muir et al. 1986.
initialConcentration_g_per_kg_UserSupplied	0.0	0.0	n/a
WormSoilPartitionCoefficient_dryweight	7.80E-01	3.00E-02	U.S. EPA 1999; recommended soil-to-soil invertebrate BCF (dry wt soil/wet wt worm) (EPA calculated value by multiplying the TCDD BCF by a bioaccumulation equivalency factor), converted to wet wt soil/wet wt worm assuming 20% as fraction water content.
WormSoilWaterInteraction_alpha	0.95	0.95	selected value
WormSoilWaterInteraction_t_alpha	50	50	Reinecke and Nash 1984; measured for TCDD
Soil Detritivore - Soil Arthropod			
Arthropod_Soil PartitionCoefficient	7.80E-01	3.00E-02	U.S. EPA 1999; recommended soil-to-soil invertebrate BCF (dry wt soil/wet wt worm) (EPA calculated value by multiplying the TCDD BCF by a bioaccumulation equivalency factor), converted to wet wt soil/wet wt worm assuming 20% as fraction water content.
ArthropodSoilPartitioning_ AlphaofEquilibrium	0.95	0.95	default
ArthropodSoilPartitioning_TimetoReachAlphaof Equilibrium	50	50	no data were found; used time to reach alpha of equilibrium for TCDD in earthworm in Reinecke and Nash 1984.
Halflife	250	400000	TCDF: used TCDD data; HxCDF and HpCDF: used HxCDD and HpCDD data; OCDF: Clark and Mackay 1991; metabolism of OCDF in guppy; PeCDF: Sijm et al. 1990 quoted elimination rate for carp, metabolic rate calculated assuming 9% metabolites like hepta and hexa isomers as cited in Muir et al. 1986.
initialConcentration_g_per_kg_UserSupplied	0.0	0.0	n/a
Terrestrial Bird Compartment Types[a]			
AssimilationEfficiency FromArthropods	0.58	0.58	Noseck et al. 1992; TCDD data for ring-necked pheasant
AssimilationEfficiency FromFood	1	1	set to 1[b]

Terrestrial Animal Compartment Types

TRIM.FaTE Property Name	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	Reference
AssimilationEfficiency FromPlants	1	1	set to 1[b]
AssimilationEfficiency FromSoils	0.33	0.33	Noseck et al. 1992; TCDD data for ring-necked pheasant
AssimilationEfficiency FromWater	1	1	set to 1[b]
AssimilationEfficiency FromWorms	0.3	0.3	Noseck et al. 1992; data for ring-necked pheasant
InhalationAssimilationEfficiency	1	1	professional judgment, assuming inhalation rate in model is total rate, not alveolar rate
initialConcentration_g_per_kg_UserSupplied	0.0	0.0	n/a
Terrestrial Mammal Compartment Typ			
AssimilationEfficiency FromArthropods	1	1	set to 1[b]
AssimilationEfficiency FromFood	1	1	set to 1[b]
AssimilationEfficiency FromPlants	1	1	set to 1[b]
AssimilationEfficiency FromSoils	1	1	set to 1[b]
AssimilationEfficiency FromWater	1	1	set to 1[b]
AssimilationEfficiency FromWorms	1	1	set to 1[b]
InhalationAssimilation Efficiency	0.8	0.8	professional judgment, assuming inhalation rate in model is total rate, not alveolar rate
initialConcentration_g_per_kg_UserSupplied	0.0	0.0	n/a

[a]TRIM.FaTE Reference Library includes Terrestrial Herbivore - Long-tailed Vole, Terrestrial Herbivore - Meadow Vole, Terrestrial Herbivore - Mul Deer/Black-tailed Deer, Terrestrial Herbivore - W

[b]All ingestion assimilation efficiencies set to 1

Semi-aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Semi-aquatic Carnivore - Bald Eagle		Semi-aquatic Carnivore - Mink		Semi-aquatic Insectivore - Tree Swallow	
			Value Used	Reference	Value Used	Reference	Value Used	Reference
All Compartment Types								
BW	Fresh body weight of individual animal (i.e., wet weight)	kg	4.74	Dunning 1993	0.831	Mumford and Whitaker 1982	0.0201	Dunning 1993
FoodIngestionRate[a]	Total amount of food eaten per day, normalized to body weight	kg[diet wet wt]/kg[body wet wt]-day	0.12	Stalmaster and Gessaman 1984	0.14	mink in captivity, Bleavins and Aulerich 1981	0.198	calculated from Williams 1988, Quinney and Ankney 1985, and Bell 1990
FractionDietBenthicInvertebrate	Fraction of diet comprised of benthic invertebrate	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietChickadee	Fraction of diet comprised of black-capped chickadee	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietEmergingBenthicInsects	Fraction of diet comprised of emerging benthic insects	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietFishbenthiccarnivore	Fraction of diet comprised of benthic carnivore	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietFishbenthicomnivore	Fraction of diet comprised of benthic omnivore	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietFishcarnivore	Fraction of diet comprised of water-column carnivore	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietFishherbivore	Fraction of diet comprised of water-column herbivore	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietFishomnivore	Fraction of diet comprised of water-column omnivore	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietMacrophyte	Fraction of diet comprised of macrophyte	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietMouse	Fraction of diet comprised of mouse	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietPlant	Fraction of diet comprised of terrestrial plant	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietvole	Fraction of diet comprised of vole	unitless	unset	n/a	unset	n/a	unset	n/a
FractionDietWorm	Fraction of diet comprised of worm	unitless	unset	n/a	unset	n/a	unset	n/a
FractionExcretiontoSoil	Fraction of total wildlife elimination in urine and feces that goes to surface soil	unitless	0.5	professional judgment	0.5	professional judgment	1	professional judgment
FractionExcretiontoWater	Fraction of total wildlife elimination in urine and feces that goes to surface water	unitless	0.5	professional judgment	0.5	professional judgment	0	professional judgment
InhalationProps_A	Allometric scaling constant used to calculate inhalation rate based on body weight	unitless	0.409	Lasiewski and Calder 1971	0.546	Stahl 1967	0.409	Lasiewski and Calder 1971
InhalationProps_B	Allometric scaling constant used to calculate inhalation rate based on body weight	unitless	0.8	Lasiewski and Calder 1971	0.8	Stahl 1967	0.8	Lasiewski and Calder 1971
NumberofIndividualsPerSquareMeter	Number of individuals per unit surface area	$\#/m^2$	unset	n/a	unset	n/a	unset	n/a
SoilFractionofDryDiet	Fraction of total dry wt intake comprised of soil. When UseSoilFractionofDryDietToCalculateSoilIngestionRate is set to TRUE, this property is used to calculate soil ingestion rate.	unitless, dry wt basis	0	professional judgment	0	professional judgment	0	professional judgment
SoilIngestionRate_UserSupplied	Total amount of soil eaten per day by birds or mammals, normalized to body weight (calculated from value for FractionDiet_Soil (dry wt basis) and food ingestion rate)	kg[soil dry wt]/kg[body wet wt]-day	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)
UseSoilFractionofDryDietToCalculateSoilIngestionRate	Specifies whether to use calculated or user-supplied soil ingestion rate. If true, SoilIngestionRate is calculated based on SoilFractionofDryDiet. If false, SoilIngestionRate is user-supplied.	true= yes, false= no	true	set to calculate 0	true	set to calculate 0	true	set to calculate 0
WaterIngProps_A	Allometric scaling constant used to calculate water ingestion rate based on body weight	unitless	0.059	Calder and Braun 1983	0.099	Calder and Braun 1983	0.059	Calder and Braun 1983
WaterIngProps_B	Allometric scaling constant used to calculate water ingestion rate based on body weight	unitless	0.67	Calder and Braun 1983	0.9	Calder and Braun 1983	0.67	Calder and Braun 1983

[a]See Attachment 1 for documentation of food ingestion rate calculations

Semi-aquatic Animal Compartment Types

TRIM.FaTE Property Name	Semi-aquatic Omnivore - Mallard		Semi-aquatic Omnivore - Raccoon		Semi-aquatic Piscivore - Common Loon		Semi-aquatic Piscivore - Kingfisher	
	Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference
All Compartment Types								
BW	1.13	Nelson and Martin 1953	6.35	Lotze and Anderson 1979	4.13	Dunning 1993	0.148	Dunning 1993
FoodIngestionRate[a]	0.1	Heinz et al. 1987	0.11	calculated based on allometric equation (Nagy et al.1999) and professional judgment	0.23	Barr 1996	0.35	calculated based on allometric equation (Nagy 1987) and professional judgment
FractionDietBenthicInvertebrate	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietChickadee	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietEmergingBenthicInsects	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietFishbenthiccarnivore	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietFishbenthicomnivore	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietFishcarnivore	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietFishherbivore	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietFishomnivore	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietMacrophyte	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietMouse	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietPlant	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietvole	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietWorm	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionExcretiontoSoil	0.5	professional judgment	0.5	professional judgment	0.5	professional judgment	0.5	professional judgment
FractionExcretiontoWater	0.5	professional judgment	0.5	professional judgment	0.5	professional judgment	0.5	professional judgment
InhalationProps_A	0.409	Lasiewski and Calder 1971	0.546	Stahl 1967	0.409	Lasiewski and Calder 1971	0.409	Lasiewski and Calder 1971
InhalationProps_B	0.8	Lasiewski and Calder 1971	0.8	Stahl 1967	0.8	Lasiewski and Calder 1971	0.8	Lasiewski and Calder 1971
NumberofIndividualsPerSquareMeter	unset	n/a	unset	n/a	unset	n/a	unset	n/a
SoilFractionofDryDiet	0.033	Beyer et al. 1994	0.094	Beyer et al. 1994	0	professional judgment	0	professional judgment
SoilIngestionRate_UserSupplied	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)	0	not used (model set to calculate value based on fraction diet-soil and food ingestion rate)
UseSoilFractionofDryDietToCalculateSoilIngestionRate	true	user input not available	true	user input not available	true	set to calculate 0	true	set to calculate 0
WaterIngProps_A	0.059	Calder and Braun 1983	0.099	Calder and Braun 1983	0.059	Calder and Braun 1983	0.059	Calder and Braun 1983
WaterIngProps_B	0.67	Calder and Braun 1983	0.9	Calder and Braun 1983	0.67	Calder and Braun 1983	0.67	Calder and Braun 1983

Semi-aquatic Animal Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
AssimilationEfficiencyFromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
AssimilationEfficiencyFromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1	1	1	set to 1[b]
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0.09	for rats, Takeda and Ukita 1970
InhalationAssimilationEfficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	0.75	0.4	0.75	Hg(0) - based on human values, ATSDR 1997, Teisinger and Fiserova-Bergerova 1965; Hg(2) - based on dog value, U.S. EPA 1997; MHg - assumed same as Hg(0)
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	unset	unset	unset	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	professional judgment
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	1	n/a	n/a	professional judgment
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	professional judgment
TotalExcretionRate	First-order rate constant for elimination of chemical from the body (in urine, feces, feathers, fur)	1/day	0.05	0.48	0.26[c] 0.086[d]	see Attachment 2 for documentation

[a]TRIM.FaTE Reference Library includes Semi-aquatic Carnivore - Bald Eagle, Semi-aquatic Carnivore - Mink, Semi-aquatic Insectivore - Tree Swallow, Semi-aquatic Omnivore - Mallard, Semi-aquatic Omnivore - Raccoon, Semi-aquatic Piscivore - Common Loon, and Semiaquatic Piscivore - Kingfisher.

[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not absorbed) dose, hence assimilation efficiency must equal

[c]Value for all mammals.

[d]Value for all birds.

Semiaquatic Animal Compartment Types[a]

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
AssimilationEfficiency FromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
InhalationAssimilation Efficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	professional judgment, assuming inhalation rate in model is total rate, not alveolar rate
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a

[a]TRIM.FaTE Reference Library includes Semi-aquatic Carnivore - Bald Eagle, Semi-aquatic Carnivore - Mink, Semi-aquatic Insectivore - Tree Swallow, Semi-aquatic Omnivore -

[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not absorbed) dose, hence assimilation

Semiaquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
Semiaquatic Bird Compartment Types[a]										
AssimilationEfficiency FromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	0.58	0.58	0.58	0.58	0.58	0.58	0.58	Noseck et al. 1992; data for ring-necked pheasant
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Noseck et al. 1992; data for ring-necked pheasant
AssimilationEfficiency FromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	0.3	0.3	0.3	0.3	0.3	0.3	0.3	set to 1[b]
InhalationAssimilation Efficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1.0	1.0	0.9	0.9	0.9	0.8	0.8	based on rat data published in Nessel et al. 1990, Nessel et al. 1992, and Diliberto et al., 1996 (as cited in U.S. EPA 2000c)
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
Semiaquatic Mammal Compartment Types[c]										
AssimilationEfficiency FromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]

Semiaquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
AssimilationEfficiency FromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
InhalationAssimilation Efficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1.0	1.0	0.9	0.9	0.9	0.8	0.8	based on rat data published in Nessel et al. 1990, Nessel et al. 1992, and Diliberto et al., 1996 (as cited in U.S. EPA 2000c)
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a

[a]TRIM.FaTE Reference Library includes Semi-aquatic Carnivore - Bald Eagle, Semi-aquatic Insectivore - Tree Swallow, Semi-aquatic Omnivore - Mallard, Semi-aquatic Piscivore - Common Loon, and Semiaquatic Piscivore - Kingfisher.

[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not absorbed) dose, hence assimilation efficiency must equal

[c]TRIM.FaTE Reference Library includes Semi-aquatic Carnivore - Mink, and Semi-aquatic Omnivore - Raccoon

Semiaquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Semiaquatic Bird Compartment Types[a]													
AssimilationEfficiency FromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	Noseck et al. 1992; data for ring-necked pheasant
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Noseck et al. 1992; data for ring-necked pheasant
AssimilationEfficiency FromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	set to 1[b]
InhalationAssimilation Efficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1	1	1	1	1	1	1	1	1	1	professional judgment, assuming inhalation rate in model is total rate, not alveolar rate
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
Semiaquatic Mammal Compartment Types[c]													
AssimilationEfficiency FromArthropods	Fraction of amount of chemical in arthropods eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Noseck et al. 1992; data for ring-necked pheasant
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
AssimilationEfficiency FromSoils	Fraction of amount of chemical in soils eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Noseck et al. 1992; data for ring-necked pheasant
AssimilationEfficiency FromWater	Fraction of amount of chemical in drinking water that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]

Semiaquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
AssimilationEfficiency FromWorms	Fraction of amount of chemical in worms eaten that is actually absorbed by the animal	unitless	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	set to 1[b]
InhalationAssimilation Efficiency	Fraction of amount of chemical breathed that is actually absorbed by the animal	unitless	1	1	1	0.9	0.9	0.9	0.9	0.8	0.8	0.8	professional judgment, assuming inhalation rate in model is total rate, not alveolar rate
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a

[a]TRIM.FaTE Reference Library includes Semi-aquatic Carnivore - Bald Eagle, Semi-aquatic Insectivore - Tree Swallow, Semi-aquatic Omnivore - Mallard, Semi-aquatic Piscivore - Common Loon, and Semiaquatic Piscivore - Kingfisher.

[b]All ingestion assimilation efficiencies set to 1 to be consistent with excretion rate calculations. Excretion rates are all based on ingested (not absorbed) dose, hence assimilation efficiency must equal 1.

[c]TRIM.FaTE Reference Library includes Semi-aquatic Carnivore - Mink, and Semi-aquatic Omnivore - Raccoon

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Water-column Carnivore		Water-column Herbivore		Water-column Omnivore		Benthic Carnivore		Benthic Omnivore	
			Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference	Value Used	Reference
All Fish Compartment Types												
BW	Fresh body weight of individual animal (i.e., wet weight)	kg	2[a]	professional judgment	0.025[a]	professional judgment	0.25[a]	professional judgment	2[a]	professional judgment	2[a]	professional judgment
FractionDietAlgae	Fraction of diet comprised of algae	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietBenthic Carnivore	Fraction of diet comprised of benthic carnivore	unitless	unset	n/a	n/a	n/a	unset	n/a	n/a	n/a	unset	n/a
FractionDietBenthic Invertebrate	Fraction of diet comprised of benthic invertebrate	unitless	unset	n/a	unset	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietFishbenthico mnivore	Fraction of diet comprised of benthic omnivore	unitless	unset	n/a	n/a	n/a	unset	n/a	unset	n/a	n/a	n/a
FractionDietMacrophyte	Fraction of diet comprised of macrophyte	unitless	n/a	n/a	unset	n/a	unset	n/a	n/a	n/a	n/a	n/a
FractionDietFishherbivore	Fraction of diet comprised of water-column herbivore	unitless	unset	n/a	n/a	n/a	unset	n/a	unset	n/a	unset	n/a
FractionDietFishomnivore	Fraction of diet comprised of water-column omnivore	unitless	unset	n/a	n/a	n/a	unset	n/a	unset	n/a	unset	n/a
FishLipidFraction	Mass fraction of fish that is lipid (wet wt basis)	kg[lipid]/kg[fish wet wt]	0.057	Thomann 1989	0.034	Thomann 1989	0.07	Thomann 1989	0.057	Thomann 1989	0.07	Thomann 1989
NumberofFishperSquareM eter	Number of fish per unit surface water area	#/m^2	calculated[b]	n/a	calculated[b]	n/a	calculated[b]	n/a	calculated[b]	n/a	calculated[b]	n/a

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
Benthic Invertebrate Compartment Type				
BiomassPerArea_kg_m2	Mass of macrophytes per unit surface water area (wet wt basis)	kg/m^2	0.02	n/a
BW	Fresh body weight of individual animal (i.e., wet weight)	kg	2.55E-04	n/a

[a]Scenario-specific parameters
[b]Equation provided: compartment.BiomassPerArea_kg_m2/compartment.BW

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
Benthic Invertebrate Compartment Type						
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user.	g/kg	unset	unset	unset	n/a
SedimentPartitioning_AlphaofEquilibrium	Proportion of equilibrium value reached	unitless	0.95	0.95	0.95	Selected value (i.e., proportion of equilibrium achieved by time "t").
SedimentPartitioning_PartitionCoefficient	Equilibrium ratio of concentration in benthic invertebrate to concentration in either bulk sediment (i.e., wet wt sediment) or sediment pore water, depending on whether the partition coefficient is based on bulk sediment or sediment pore water (user must select corresponding algorithm).	kg[bulk sediment]/kg[invertebrate wet wt]	0.0824	0.0824	5.04	Hg(0) - assumed based on Hg(2) value; Hg(2) and MHg - Saouter et al. 1991.
SedimentPartitioning_TimeToReachAlphaofEquilibrium	Time to reach 100 x alpha percent of equilibrium	day	14	14	14	Experiment duration from Saouter et al.1991.
All Fish Compartment Types[a]						
DemethylationRate	First-order rate constant for demethylation of methyl- to divalent mercury (MHg->Hg2)	1/day	n/a	n/a	0	Assumption.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	unset	unset	unset	n/a
MethylationRate	First-order rate constant for methylation (Hg2->MHg)	1/day	n/a	0	n/a	Assumption.
OxidationRate	First-order rate constant for oxidation of elemental to divalent mercury (Hg0->Hg2)	1/day	1.0E+06	n/a	n/a	Assumption.
ReductionRate	First-order rate constant for reduction (Hg2->Hg0)	1/day	n/a	0	n/a	Assumption.
Water-column Carnivore Compartment Type						
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.06	0.06	0.2	Williams et al. 2010.
HowMuchFasterHgEliminationIsThanForMHg	Factor used to adjust experimental data on elimination rate for MHg to estimate elimination rates for Hg0 and Hg2	unitless	3	3	1	Trudel and Rasmussen 1997
Water-column Herbivore Compartment Type						
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.06	0.06	0.5	Williams et al. 2010.
AssimilationEfficiencyFromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	Professional judgment.
HowMuchFasterHgEliminationIsThanForMHg	Factor used to adjust experimental data on elimination rate for MHg to estimate elimination rates for Hg0 and Hg2	unitless	3	3	1	Trudel and Rasmussen 1997.
Water-column Omnivore Compartment Type						
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.06	0.06	0.5	Williams et al. 2010.

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
AssimilationEfficiencyFromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	1	1	1	Professional judgment.
HowMuchFasterHgEliminationIsThanForMHg	Factor used to adjust experimental data on elimination rate for MHg to estimate elimination rates for Hg0 and Hg2	unitless	3	3	1	Trudel and Rasmussen 1997
Benthic Carnivore Compartment Type						
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.06	0.06	0.5	Williams et al. 2010.
HowMuchFasterHgEliminationIsThanForMHg	Factor used to adjust experimental data on elimination rate for MHg to estimate elimination rates for Hg0 and Hg2	unitless	3	3	1	Trudel and Rasmussen 1997
Benthic Omnivore Compartment Type						
AssimilationEfficiencyFromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.06	0.06	0.5	Williams et al. 2010.
HowMuchFasterHgEliminationIsThanForMHg	Factor used to adjust experimental data on elimination rate for MHg to estimate elimination rates for Hg0 and Hg2	unitless	3	3	1	Trudel and Rasmussen 1997

[a]TRIM.FaTE Reference Library includes Benthic Carnivore, Benthic Omnivore, Water-column Carnivore, Water-column Herbivore, and Water-column Omnivore.

Aquatic Animal Compartment Types

Parameter Name	Units	Value	Reference
Zooplankton Compartment Type			
Absorption rate constant	L[water]/kg[fish wet wt]-day	1500	Goulet 2007.
Assimilation efficiency from algae	unitless	0.5	Goulet 2007.
Elimination rate constant	1/day	0.03	Goulet 2007.
Benthic Invertebrate Compartment Type			
Sediment partitioning - alpha of equilibrium	unitless	0.95	Assumption.
Sediment partitioning - partition coefficient	kg[bulk sed/kg[benthic invertebrate wet wt]	0.27	Assumption.
Sediment partitioning - time to reach alpha of equilibrium	day	21	Hare et al. 2001.
Benthic Omnivore Compartment Type			
Assimilation efficiency from food	unitless	0.1	Assumption based on Yan and Wang 2002.
Absorption rate constant	L[water]/kg[fish wet wt]-day	1.23[a]	Calculated based on body weight from regression in Hendriks and Heikens 2001.
Elimination rate constant	1/day	1.732E-02	Assumption.
Benthic Carnivore Compartment Type			
Assimilation efficiency from food	unitless	0.1	Professional judgement based on Yan and Wang 2002.
Absorption rate constant	L[water]/kg[fish wet wt]-day	0.66[a]	Calculated based on body weight from regression in Hendriks and Heikens 2001.
Elimination rate constant	1/day	1.68E-03	Computed based on empirical equation[b].
Water-column Herbivore Compartment Type			
Assimilation efficiency from food	unitless	0.1	Assumed value based on Yan and Wang 2002.
Assimilation efficiency from plants	unitless	0.1	Assumed value based on Yan and Wang 2002.
Absorption rate constant	L[water]/kg[fish wet wt]-day	2.46[a]	Calculated based on body weight from regression in Hendriks and Heikens 2001.
Elimination rate constant	1/day	1.732E-02	Assumption.

Aquatic Animal Compartment Types

Parameter Name	Units	Value	Reference
Water-column Omnivore Compartment Type			
Assimilation efficiency from food	unitless	0.1	Assumption based on Yan and Wang 2002.
Assimilation efficiency from plants	unitless	0.1	Assumption based on Yan and Wang 2002.
Absorption rate constant	L[water]/kg[fish wet wt]-day	1.23[a]	Calculated based on body weight from regression in Hendriks and Heikens 2001.
Elimination rate constant	1/day	1.732E-02	Assumption.
Water-column Carnivore Compartment Type			
Assimilation efficiency from food	unitless	0.1	Assumption based on Yan and Wang 2002.
Absorption rate constant	L[water]/kg[fish wet wt]-day	0.66[a]	Calculated based on body weight from regression in Hendriks and Heikens 2001.
Elimination rate constant	1/day	1.732E-02	Assumption.

[a]Formula used: 10**(-0.30*log10(compartment.BW)-0.09).
[b]Formula used: 10**(-0.25*log10(compartment.BW)-2.7).

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Benthic Invertebrate Compartment Type										
ClearanceConstant	Rate of water passing over respiratory surface scaled to benthic invertebrate mass	unitless	100.6	100.6	100.6	100.6	100.6	100.6	100.6	Stehly et al. 1990.
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	16.5	1.284	17	17	0.495	17	17	Moermond et al. 2007.
initialConcentration_g_per_kg_UserSupplied	Initial concentration	g/kg	unset	unset	unset	unset	unset	unset	unset	n/a
SedimentPartitioning_Alpha of Equilibrium	Alpha of equilibrium for sediment partitioning	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Selected value.
SedimentPartitioning_Time To ReachAlphaofEquilibrium	t-alpha for equilibrium for sediment partitioning	days	14	14	14	14	14	14	14	Professional judgment.
V_d	Ratio of concentration in benthic invertebrate to concentration in water	L[water]/kg[benthic invertebrate wet wt]	7,235	7,235	7,235	7,235	7,235	7,235	7,235	Stehly et al. 1990; estimated for mayfly, 120-day-old nymphs.
All Fish Compartment Types[a]										
initialConcentration_g_per_kg_UserSupplied	Initial concentration	g/kg	unset	unset	unset	unset	unset	unset	unset	n/a
Gamma_fish	Gamma_fish	unitless	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Thomann 1989.
Water-column Carnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1.925	0.408	2	2	0.533	2	2	See footnote[b]
Water-column Herbivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	n/a
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1.925	0.408	2	2	0.533	2	2	See footnote[b]

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
Water-column Omnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	n/a
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1.925	0.408	2	2	0.533	2	2	See footnote[b]
Benthic Carnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1.925	0.408	2	2	0.533	2	2	See footnote[b]
Benthic Omnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	1.925	0.408	2	2	0.533	2	2	See footnote[b]

[a]TRIM.FaTE Reference Library includes Benthic Carnivore, Benthic Omnivore, Water-column Carnivore, Water-column Herbivore, Water-column Omnivore.

[b]BaA,BaP,Chr: Moermond et al. 2007. BbF, BkF, DahA, IcdP: Values for higher MW PAHs set equal to value for highest MW PAH with data from Moermond et al. 2007.

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
Benthic Invertebrate Compartment Type										
ClearanceConstant	Rate of water passing over respiratory surface scaled to benthic invertebrate mass	L[water cleared]/kg[benthic invertebrate wet wt]-hr	100.6	100.6	100.6	100.6	100.6	100.6	100.6	Stehly et al. 1990; estimated for mayfly, 120-day-old nymphs, CLVM model.
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.722	17	0.722	0.722	17	0.722	0.722	See footnote[d]
initialConcentration_g_per_kg_UserSupplied	Initial concentration	g/kg	Unset	Unset	Unset	Unset	Unset	Unset	Unset	n/a
SedimentPartitioning_Alpha of Equilibrium	Alpha of equilibrium for sediment partitioning	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Selected value
SedimentPartitioning_Time To ReachAlphaofEquilibrium	t-alpha for equilibrium for sediment partitioning	day	14	14	14	14	14	14	14	Professional judgement
V_d	Ratio of concentration in benthic invertebrate to concentration in water	L[water]/kg[benthic invertebrate wet wt]	7235	7235	7235	7235	7235	7235	7235	Stehly et al. 1990; estimated for mayfly, 120-day-old nymphs.
All Fish Compartment Types[a]										
initialConcentration_g_per_kg_UserSupplied	Initial concentration	g/kg	Unset	Unset	Unset	Unset	Unset	Unset	Unset	n/a
Gamma_fish	Gamma_fish	unitless	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Thomann 1989.
Water-column Carnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.5	0.15	0.5	0.32	0.15	0.14	0.14	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.2	2	0.2	0.2	2	0.165	0.2	(See footnote)[b]
Water-column Herbivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.5	0.15	0.5	0.32	0.15	0.14	0.14	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.5	0.15	0.5	0.32	0.15	0.14	0.14	n/a; Exceptions: (Acenaphthylene) Niimi and Dookhran 1989 (Fluoranthene and Fluorene) Niimi and Palazzo 1986.
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.2	2	0.2	0.2	2	0.165	0.2	(See footnote)[b]

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
Water-column Omnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.5	0.15	0.5	0.32	0.15	0.14	0.14	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.5	0.15	0.5	0.32	0.15	0.14	0.14	n/a; Exceptions: (2Methyl and Acenaphthene, see footnote[c]), (Acenaphthylene) Niimi and Dookhran 1989. (Fluoranthene and Fluorene) Niimi and Palazzo 1986.
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.2	2	0.2	0.2	2	0.165	0.2	(See footnote)[b]
Benthic Carnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.5	0.15	0.5	0.32	0.15	0.14	0.14	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.2	2	0.2	0.2	2	0.165	0.2	(See footnote)[b]
Benthic Omnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.5	0.15	0.5	0.32	0.15	0.14	0.14	Lemair et al. 1992. Exceptions include Barber 2008 (2-Methylnaphthalene and Acenaphthene) and Niimi and Palazzo 1986 (Acenaphthylene, Fluoranthene, and Fluorene).
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	0.2	2	0.2	0.2	2	0.165	0.2	(See footnote)[b]

[a]TRIM.FaTE Reference Library includes Benthic Carnivore, Benthic Omnivore, Water-column Carnivore, Water-column Herbivore, Water-column Omnivore.
[b] Values for [(2Methyl, Acenaphthene, Acenaphthylene, Fluorene) lower, (712DMB, BghiP) higher] MW PAHs set equal to value for [(2Methyl, Acenaphthene, Acenaphthylene, Fluorene) lowest, (712DMB, BghiP) highest] MW PAH with data from Moermond et al. 2007. Exception: Fluoranthene (value still from Moermond et al. 2007).
[c]Highest assimilation efficiency from the range for BaP that was reported in Wang & Wang 2006.
[d]Values for the lower [2Methyl, Acenaphthene, Acenaphthylene, Flouranthene, Fluorene] or higher [712DMB, BgiP] MW PAHs set equal to the value for fluoranthene [2Methyl, Acenaphthene, Acenaphthylene, Flouranthene, Fluorene] or BaP [712DMB, BgiP]; Moermond et al. 2007.

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8 HpCDD	1,2,3,4,6,7,8,9-OCDD	
Benthic Invertebrate Compartment Type										
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	5776.2	5776.2	5776.2	5776.2	5776.2	5776.2	5776.2	2,3,7,8-TCDD: Calculated from Rubinstein et al. (1990) elimination half-life of 120 days for sandworms exposed to 2,3,7,8-TCDD and assuming 2% metabolites reported for fish. All others: assumed to be the same as for 2,3,7,8-TCDD. 1,2,3,4,6,7,8-HpCDD: depends on proportion of congeners with 2, 3 & 7 ,8 substitutions.
initialConcentration_g_per_kg_UserSupplied	Initial concentration	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
SedimentPartitioning_AlphaofEquilibrium	Alpha of equilibrium for sediment partitioning	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Rubenstein et al. 1990.
SedimentPartitioning_PartitionCoefficient	Equilibrium ratio of concentration in benthic invertebrate to concentration in either bulk sediment (i.e., wet wt sediment) or sediment pore water, depending on whether the partition coefficient is based on bulk sediment or sediment pore water (user must select corresponding algorithm)	kg/kg	0.205	0.098	0.033	0.013	0.015	0.0055	0.0013	Rubinstein et al. 1990; used TCDD data for sandworm.
SedimentPartitioning_TimeToReachAlphaofEquilibrium	t-alpha for equilibrium for sediment partitioning	day	120	120	120	120	120	120	120	Rubenstein et al. 1990.
Water-column Carnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.41	0.42	0.31	0.31	0.31	0.13	0.08	Morrison et al. 1999. Exceptions: (1,2,3,4,6,7,8,9-OCDD) Niimi and Oliver 1986, (1,2,3,4,6,7,8-HpCDD) Van den Berg et al. 1994.
FishChemicalUptake RateviaGill	Fish uptake rate of chemical via gill (equivalent to fish ventilation rate)	L[water]/kg[fish wet wt]-day	600	700	102	300	300	56	11	See footnote[a]
GillEliminationRate[b]	Rate constant for chemical elimination from fish to water via gills	1/day	use formula	use formula	use formula	use formula	use formula	use formula	use formula	n/a
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Berntssen et al. 2007. - single rate constant of 0.01/day yields a halflife of approximately 69 days. Cited as representing all PCDD/Fs.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
Water-column Herbivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.41	0.42	0.37	0.31	0.31	0.21	0.08	Morrison et al. 1999. Exceptions include Niimi and Oliver 1996 (1,2,3,4,6,7,8,9-OCDD) and Van den Berg et al. 1994 (1,2,3,4,6,7,8-HpCDD).

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8 HpCDD	1,2,3,4,6,7,8,9-OCDD	
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.41	0.42	0.37	0.31	0.31	0.21	0.08	Same as AssimilationEfficiencyFromFood.
FishChemicalUptake RateviaGill	Fish uptake rate of chemical via gill (equivalent to fish ventilation rate)	L[water]/kg[fish wet wt]-day	600	700	102	300	300	56	11	See footnote[a]
GillEliminationRate[b]	Rate constant for chemical elimination from fish to water via gills	1/day	use formula	use formula	use formula	use formula	use formula	use formula	use formula	n/a
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Berntssen et al. 2007. - single rate constant of 0.01/day yields a halflife of approximately 69 days. Cited as representing all PCDD/Fs.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a
Water-column Omnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.41	0.42	0.31	0.31	0.31	0.21	0.08	Morrison et al. 1999. Exceptions include Niimi and Oliver 1996 (1,2,3,4,6,7,8,9-OCDD) and Van den Berg et al. 1994 (1,2,3,4,6,7,8-HpCDD).
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.41	0.42	0.31	0.31	0.31	0.21	0.08	Same as assimilation efficiency from food
FishChemicalUptake RateviaGill	Fish uptake rate of chemical via gill (equivalent to fish ventilation rate)	L[water]/kg[fish wet wt]-day	600	700	102	300	300	56	11	See footnote[a]
GillEliminationRate[b]	Rate constant for chemical elimination from fish to water via gills	1/day	use formula	use formula	use formula	use formula	use formula	use formula	use formula	n/a
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Berntssen et al. 2007. - single rate constant of 0.01/day yields a halflife of approximately 69 days. Cited as representing all PCDD/Fs.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	n/a

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8 HpCDD	1,2,3,4,6,7,8,9-OCDD	
Benthic Carnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.41	0.42	0.31	0.31	0.31	0.13	0.08	Morrison et al. 1999. Exceptions: (1,2,3,4,6,7,8,9-OCDD) Niimi and Oliver 1986, (1,2,3,4,6,7,8-HpCDD) Van den Berg et al. 1994.
FishChemicalUptake RateviaGill	Fish uptake rate of chemical via gill (equivalent to fish ventilation rate)	L[water]/kg[fish wet wt]-day	600	700	102	300	300	56	11	See footnote[a]
GillEliminationRate[b]	Rate constant for chemical elimination from fish to water via gills	1/day	use formula	use formula	use formula	use formula	use formula	use formula	use formula	n/a
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Berntssen et al. 2007- single rate constant of 0.01/day yields a halflife of approximately 69 days. Cited as representing all PCDD/Fs
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
Benthic Omnivore Compartment Type										
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.41	0.42	0.31	0.31	0.31	0.21	0.08	Morrison et al. 1999. Exceptions include Niimi and Oliver 1986 (1,2,3,4,6,7,8,9-OCDD) and Van den Berg et al. 1994 (1,2,3,4,6,7,8-HpCDD).
FishChemicalUptake RateviaGill	Fish uptake rate of chemical via gill (equivalent to fish ventilation rate)	L[water]/kg[fish wet wt]-day	600	700	102	300	300	56	11	See footnote[a]
GillEliminationRate[b]	Rate constant for chemical elimination from fish to water via gills	1/day	use formula	use formula	use formula	use formula	use formula	use formula	use formula	n/a
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	Berntssen et al. 2007- single rate constant of 0.01/day yields a halflife of approximately 69 days. Cited as representing all PCDD/Fs.
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a

[a](1,2,3,4,6,7,8,9-OCDD, 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,7,8-HxCDD) :Muir et al. 1985. (1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD): Interpolated from Muir et al. 1985 considering congener-specific differences in relative assimilation efficiencies from food. (1,2,3,7,8-PeCDD, 2,3,7,8-TCDD): Values compiled for one year-old guppies at start of experiment from Opperhuizen et al. 1986.
[b]Formula provided: compartment.Chemical.FishChemicalUptakeRateviaGill / currentChemical.K_ow.

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Benthic Invertebrate Compartment Type													
initialConcentration_g_per_kg_UserSupplied	Initial concentration	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
SedimentPartitioning_AlphaofEquilibrium	Alpha of equilibrium for sediment partitioning	unitless	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Rubinstein et al. 1990.
SedimentPartitioning_TimeToReachAlphaofEquilibrium	t-alpha for equilibrium for sediment partitioning	day	42	42	42	42	42	42	42	42	42	42	Rubinstein et al. 1990.
SedimentPartitioning_ PartitionCoefficient	Equilibrium ratio of concentration in benthic invertebrate to concentration in either bulk sediment (i.e., wet wt sediment) or sediment pore water, depending on whether the partition coefficient is based on bulk sediment or sediment pore water (user must select corresponding algorithm)	kg/kg	0.056	0.024	0.17	0.0081	0.02	0.067	0.072	0.0012	0.042	0.0017	Rubinstein et al. 1990; used TCDD data for sandworm.
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	5776.2	5776.2	5776.2	5776.2	5776.2	5776.2	5776.2	5776.2	5776.2	5776.2	Rubinstein et al. 1990; Assumed to be the same as for 2,3,7,8-TCDD data for sandworm, Except for 1,2,3,4,6,7,8-HpCDF and 1,2,3,4,7,8,9-HpCDF which are same as 1,2,3,4,6,7,8 HpCDD.
All Fish Compartment Types[a]													
Gamma_fish	Allometric scaling factor used in estimating gill uptake	unitless	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Thomann 1989
initialConcentration_g_per_kg_UserSupplied	Initial concentration in the compartment, provided by the user	g/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a
Water-column Carnivore Compartment Type													
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.51	0.42	0.42	0.31	0.31	0.31	0.31	0.09	0.2	0.05	See footnote[b]
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Berntssen et al. 2007.
Water-column Herbivore Compartment Type													
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.51	0.42	0.42	0.31	0.31	0.31	0.31	0.09	0.2	0.05	See footnote[b]
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.51	0.42	0.42	0.31	0.31	0.31	0.31	0.09	0.2	0.05	Same as AssimilationEfficiencyFromFood.
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Berntssen et al. 2007.

Aquatic Animal Compartment Types

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
Water-column Omnivore Compartment Type													
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.51	0.42	0.42	0.31	0.31	0.31	0.31	0.09	0.2	0.05	See footnote[b]
AssimilationEfficiency FromPlants	Fraction of amount of chemical in terrestrial plants eaten that is actually absorbed by the animal	unitless	0.51	0.42	0.42	0.31	0.31	0.31	0.31	0.09	0.2	0.05	Same as assimilation efficiency from food.
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Berntssen et al. 2007.
Benthic Carnivore Compartment Type													
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.51	0.42	0.42	0.31	0.31	0.31	0.31	0.09	0.2	0.05	See footnote[b]
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Berntssen et al. 2007.
Benthic Omnivore Compartment Type													
AssimilationEfficiency FromFood	Fraction of amount of chemical in food eaten that is actually absorbed by the animal	unitless	0.51	0.42	0.42	0.31	0.31	0.31	0.31	0.09	0.2	0.05	See footnote[b]
Halflife	Length of time for chemical amount to be reduced by one-half by degradation reactions	day	70	70	70	70	70	70	70	70	70	70	Berntssen et al. 2007.

[a]Screening scenario includes: Benthic Omnivore, Benthic Carnivore, Water-column Herbivore, Water-column Omnivore, and Water-column Carnivore.
[b]Morrison et al. 1999. Exceptions include Niimi and Oliver 1996 (1,2,3,4,6,7,8,9-OCDF), Berntssen et al. 2007 (1,2,3,4,6,7,8-HpCDF), and 1,2,3,4,7,8,9-HpCDF set conservatively as approximate linear interpolation between values for 1,2,3,4,7,8-HxCDD and 1,2,3,4,6,7,8-HpCDD / 1,2,3,4,6,7,8-HpCDF (i.e., 0.3 to 0.1–0.2).

Chemical-Dependent / Independent of Compartment Type for Mercury -- Documentation for TRIM.FaTE Public Reference Library

TRIM.FaTE Property Name	Property Description	Units	Value			Reference
			Hg(0)	Hg(2)	MHg	
CAS	A unique Chemical Abstract Service (CAS) number for this Chemical; used in downstream TRIM modules	unitless	7439-97-6	14302-87-5	22967-92-6	ChemFinder database
D_pureair	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in gas phase due to diffusion, in m2/day	m^2[air]/day	0.478	0.478	0.456	U.S. EPA 1997
D_purewater	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in aqueous phase due to diffusion, in m2/day	m^2[water]/day	5.54E-05	5.54E-05	5.28E-05	U.S. EPA 1997
HenryLawConstant	Ratio of the aqueous-phase concentration of a chemical to its equilibrium partial pressure in the gas phase	Pa-m^3/mol	719	7.19E-05	0.0477	(Ele): Iverfeldt & Persson, 1985 [in U.S. EPA 1997] (Div): U.S. EPA 1997 (Meth): Lindquist & Rodhe, 1985 [in U.S. EPA 1997].
MeltingPoint	Temperature at which a solid becomes a liquid at standard atmospheric pressure	degrees K	234.23	550.1	443	(Ele): U.S. EPA 2004 [in U.S. EPA 2005a] (Div): SRC 2005 [in U.S. EPA 2005a] (Meth): USDHHS 1992 [in CARB 1994]
molecularWeight	Molecular weight	g/mol	201	201	216	U.S. EPA 1997
K_ow	Equilibrium ratio of concentration dissolved in octanol to concentration dissolved in water	L[water]/kg[octanol]	4.15	3.33	1.7	Mason et al. 1996
VaporWashoutRatio	Precipitation scavenging ratio for vapors (ratio of concentration in rain to concentration in vapor form in air); used in estimating wet deposition of vapors	m^3[air]/m^3[rain]	1,200	1.6E+06	0	U.S. EPA 1997, based on Petersen et al. 1995.

Parameter Name[a]	Units	Value	Reference
CAS number[b]	unitless	7440-43-9	-
Diffusion coefficient in pure air	m^2[air]/day	0.71	U.S. EPA 1996 [in U.S. EPA 1999].
Diffusion coefficient in pure water	m^2[water]/day	8.16E-05	U.S. EPA 1996 [in U.S. EPA 1999].
Henry's Law constant	Pa-m^3/mol	1.00E-37	U.S. EPA 1999 (Table A-2-35; assumed to be zero).
Melting point	degrees K	593.15	U.S. EPA 2004 [in U.S. EPA 2005a].
Molecular weight	g/mol	112.41	SRC 2005 [in U.S. EPA 2005a].
Octanol-air partition coefficient (K_{oa})	m^3[air]/m^3[octanol]	-	-
Octanol-carbon partition coefficient (K_{oc})		-	-
Octanol-water partition coefficient (K_{ow})	L[water]/kg[octanol]	-	-

[a]All parameters in this table are TRIM.FaTE chemical properties.
[b]This CAS numbers applies to elemental Cd; however, the cations of cadmium are being modeled.

Parameter Name[a]	Units	Value	Reference
CAS number	unitless	7440-38-2	-
Diffusion coefficient in pure air	m^2[air]/day	0.92	U.S. EPA 1996 [in U.S. EPA 1999]
Diffusion coefficient in pure water	m^2[water]/day	1.07E-04	U.S. EPA 1996 [in U.S. EPA 1999]
Henry's Law constant	Pa-m^3/mol	1.00E-37	U.S. EPA 1999
Melting point	degrees K	1093.15	U.S. EPA 2004 [in U.S. EPA 2005a]
Molecular weight	g/mol	77.95	SRC 2005 [in U.S. EPA 2005a]
Octanol-air partition coefficient (K_{oa})	m^3[air]/m^3[octanol]	-	-
Octanol-carbon partition coefficient (K_{oc})		-	-
Octanol-water partition coefficient (K_{ow})	L[water]/kg[octanol]	-	-

[a]All parameters in this table are TRIM.FaTE chemical properties.

Chemical-Dependent / Independent of Compartment Type for PAHs -- Documentation for TRIM.FaTE Public Reference Library

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			BaP	BaA	BbF	BkF	Chr	DahA	IcdP	
CAS	A unique Chemical Abstract Service (CAS) number for this Chemical; used in downstream TRIM modules	unitless	50-32-8	56-55-3	205-99-2	207-08-9	218-01-9	53-70-3	193-39-5	ChemFinder database
D_pureair	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in gas phase due to diffusion, in m2/day	m^2[air] / day	0.372	0.441	0.00864	0.00864	0.00864	0.00864	0.00864	U.S. EPA 2004 [in U.S. EPA 2005a]
D_purewater	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in aqueous phase due to diffusion, in m2/day	m^2[water] / day	7.78E-05	7.78E-05	8.64E-05	8.64E-05	8.64E-05	8.64E-05	8.64E-05	U.S. EPA 2004 [in U.S. EPA 2005a]
HenryLawConstant	Ratio of the aqueous-phase concentration of a chemical to its equilibrium partial pressure in the gas phase	Pa-m^3/mol	7.40E-02	1.22E+00	4.85E-02	4.30E-02	5.30E-01	7.60E-03	2.90E-02	See footnote[a]
MeltingPoint	Temperature at which a solid becomes a liquid at standard atmospheric pressure	degrees K	454.1	433.5	441	490	528.5	542.5	435	Lide 2003 [in Mackay et al. 2006]
molecularWeight	Molecular weight	g/mol	252.31	228.29	252.31	252.31	228.29	278.35	276.33	Mackay et al. 2006
K_ow	Equilibrium ratio of concentration dissolved in octanol to concentration dissolved in water	L[water] / kg[octanol]	9.33E+05	6.17E+05	6.03E+05	8.71E+05	5.37E+05	3.16E+06	5.25E+06	Hansch et al. 1995. Exceptions: (BbF) Sangster 1993, (BkF and IcdP) Passivirta et al. 1999. All in Mackay et al. 2006.
ReferenceBird_BodyWeight	Mass of individual reference bird used for allometric scaling of degradation rate	kg	0.25	0.25	0.25	0.25	0.25	0.25	0.25	U.S. EPA 1992, default rat body weight recommended by EPA for evaluation of toxicity studies in which rat body weight is not reported
ReferenceBird_GeneralDegradationRate	First-order rate constant for chemical degradation in reference bird used for allometric scaling of degradation rate	1/day	2.04	2.04	2.04	2.04	2.04	2.04	2.04	Weyand and Bevan 1986, rat study; no data available for birds, use mammalian value
ReferenceBird_EliminationRate	First-order rate constant for elimination of chemical from the body (terrestrial birds)	1/day	0.6	0.9	0.9	0.9	0.9	0.9	0.9	ATSDR 1995, no avian data, values based on mammalian oral absorption/fecal excretion data
ReferenceMammal_BodyWeight	Mass of individual reference mammal used for allometric scaling of degradation rate	kg	0.25	0.25	0.25	0.25	0.25	0.25	0.25	U.S. EPA 1992, default rat body weight recommended by EPA for evaluation of toxicity studies in which rat body weight is not reported
ReferenceMammal_GeneralDegradationRate	First-order rate constant for chemical degradation in reference mammal used for allometric scaling of degradation rate	1/day	2.04	2.04	2.04	2.04	2.04	2.04	2.04	Weyand and Bevan 1986, rat study
ReferenceMammal_EliminationRate	First-order rate constant for elimination of chemical from the body (terrestrial mammals)	1/day	0.6	0.9	0.9	0.9	0.9	0.9	0.9	ATSDR 1995, values based on mammalian oral absorption/fecal excretion data

[a]Henry's Law constant references: All are referenced in Mackay et al. 2006 from: (BaP) Altschuh et al. 1999, (BaA, Chr) Bamford et al. 1999, (BbF, IcdP) Staudinger & Roberts 2001, (BkF) Hulscher et al. 1992 , (DahA) Eastcott et al. 1988.

Chemical-Dependent / Independent of Compartment Type for PAHs -- Documentation for TRIM.FaTE Public Reference Library

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2Methyl	712DMB	Acena-phthene	Acena-phthylene	BghiP	Fluro-anthene	Fluorene	
CAS	A unique Chemical Abstract Service (CAS) number for this Chemical; used in downstream TRIM modules	unitless	91-57-6	57-97-6	83-32-9	208-96-8	191-24-2	206-44-0	86-73-7	ChemFinder database
D_pureair	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in gas phase due to diffusion, in m2/day	m^2[air] / day	0.451	0.691	0.009	0.388	0.19	0.009	0.009	U.S. EPA 2005b. Exceptions: (712 DMB): U.S. EPA 1995a. (Acenaphthene, Fluoranthene, Fluorene) U.S. EPA 2004 [in U.S. EPA 2005a].
D_purewater	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in aqueous phase due to diffusion, in m2/day	m^2[water] / day	6.70E-05	6.91E-05	8.64E-05	6.03E-05	4.5E-05	8.64E-05	8.64E-05	U.S. EPA 2005b. Exceptions: (712 DMB): U.S. EPA 1995a. (Acenaphthene, Fluoranthene, Fluorene) U.S. EPA 2004 [in U.S. EPA 2005a].
HenryLawConstant	Ratio of the aqueous-phase concentration of a chemical to its equilibrium partial pressure in the gas phase	Pa-m^3/mol	50.56	0.203	18.5	12.7	0.0278	1.96	9.81	Bamford et al. 1999 [in Mackay et al. 2006]. Exceptions: (2Methyl): Yaws et al. 1991 [in Mackay et al. 2006]. (712DMB): Derived from Meylan, 1991 in ToxNet HSDB. (BghiP): Staudinger & Roberts 2001 [in Mackay et al. 2006].
MeltingPoint	Temperature at which a solid becomes a liquid at standard atmospheric pressure	degrees K	307.6	395.5	366.4	364.8	545.5	383.19	387.77	Lide 2003 [in Mackay et al. 2006]
molecularWeight	Molecular weight	g/mol	142.2	256.34	154.21	152.2	276.33	202.25	162.22	Mackay et al. 2006
K_ow	Equilibrium ratio of concentration dissolved in octanol to concentration dissolved in water	L[water] / kg[octanol]	7244	630957	8318	10000	4265795	144544	15136	Hansch et al. 1995. Exception: (Acenaphthylene) Passivirta et al. 1999. All in Mackay et al. 2006.

Chemical-Dependent / Independent of Compartment Type for Dioxins -- Documentation for TRIM.FaTE Public Reference Library

TRIM.FaTE Property Name	Property Description	Units	Value							Reference
			2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8,9-OCDD	
CAS	A unique Chemical Abstract Service (CAS) number for this Chemical; used in downstream TRIM modules	unitless	1746-01-6	40321-76-4	39227-28-6	57653-85-7	19408-74-3	35822-46-9	3268-87-9	ChemFinder database
D_pureair	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in gas phase due to diffusion, in m2/day	m^2[air] / day	0.899	0.854	0.816	0.816	0.816	0.782	0.751	U.S. EPA 2000b [in U.S. EPA 2005a]. Exception: 2,3,7,8-TCDD; U.S. EPA 2004 [in U.S. EPA 2005a].
D_purewater	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in aqueous phase due to diffusion, in m2/day	m^2[water] / day	4.84E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	U.S. EPA 1995b [in U.S. EPA 2005a]. Exception: 2,3,7,8-TCDD; U.S. EPA 2004 [in U.S. EPA 2005a].
HenryLawConstant	Ratio of the aqueous-phase concentration of a chemical to its equilibrium partial pressure in the gas phase	Pa-m^3/mol	3.33	0.26	1.08	1.11	1.11	1.28	0.68	Mackay et al. 1992 [in U.S. EPA 2000b]. Exceptions: (1,2,3,7,8-PeCDD) Sijm et al. 1989 [in U.S. EPA 2000b], 1,2,3,6,7,8-HxCDD and 1,2,3,7,8,9-HxCDD) U.S. EPA 2000b [in U.S. EPA 2005a].
MeltingPoint	Temperature at which a solid becomes a liquid at standard atmospheric pressure	degrees K	578.7	513.7	547.2	558.7	516.7	537.7	598.7	Rodorf 1987 [in U.S. EPA 2000b]. Exception: (1,2,3,4,6,7,8,9- OCDD) Friesen et al. 1985 [in U.S. EPA 2000b].
molecularWeight	Molecular weight	g/mol	321.98	356.42	390.87	390.87	390.87	425.31	460.76	U.S. EPA 2000b [in U.S. EPA 2005a]
K_ow	Equilibrium ratio of concentration dissolved in octanol to concentration dissolved in water	L[water] / kg[octanol]	6.31E+06	1.86E+07	6.31E+07	1.62E+08	1.62E+08	1.00E+08	1.58E+08	Mackay et al. 1992 [in U.S. EPA 2000b]. Exceptions: (1,2,3,7,8- PeCDD) Passivirta et al. 1999 [in Mackay et al. 2006]], (1,2,3,6,7,8-HxCDD and 1,2,3,7,8,9- HxCDD) U.S. EPA 2000a.
ReferenceBird_BodyWeight	Mass of individual reference bird used for allometric scaling of degradation rate	kg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	Nosek et al. 1992
ReferenceBird_GeneralDegradationRate	First-order rate constant for chemical degradation in reference bird used for allometric scaling of degradation rate	1/day	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	Nosek et al. 1992
ReferenceBird_EliminationRate	First-order rate constant for elimination of chemical from the body (terrestrial birds)	1/day	0	0	0	0	0	0	0	Nosek et al. 1992
ReferenceMammal_BodyWeight	Mass of individual reference mammal used for allometric scaling of degradation rate	kg	0.021	0.021	0.021	0.021	0.021	0.021	0.021	Gasiewicz et al. 1983
ReferenceMammal_GeneralDegradationRate	First-order rate constant for chemical degradation in reference mammal used for allometric scaling of degradation rate	1/day	0.41	0.41	0.41	0.41	0.41	0.41	0.41	Gasiewicz et al. 1983
ReferenceMammal_EliminationRate	First-order rate constant for elimination of chemical from the body (terrestrial mammals)	1/day	0.12	0.12	0.2	0.2	0.2	0.3	0.48	Average of mean percent unabsorbed oral dose in Piper et al.1973; OCDD based on Birnbaum and Couture 1988; HpCDD and HxCDD based on professional judgment

TRIM.FaTE Property Name	Property Description	Units	Value										Reference
			2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDF	
CAS	A unique Chemical Abstract Service (CAS) number for this Chemical; used in downstream TRIM modules	unitless	51207-31-9	57117-41-6	57117-31-4	70648-26-9	57117-44-9	72918-21-9	60851-34-5	67562-39-4	55673-89-7	39001-02-0	ChemFinder database
D_pureair	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in gas phase due to diffusion, in m2/day	m^2[air] / day	0.203	0.192	0.192	0.183	0.183	0.183	0.183	0.176	0.176	0.168	U.S. EPA 2000b [in U.S. EPA 2005a]. Exception: (2,3,7,8- TCDF) U.S. EPA 2004 [in U.S. EPA 2005a]
D_purewater	Coefficient that (when combined with chemical concentration) predicts how quickly a chemical spreads out in aqueous phase due to diffusion, in m2/day	m^2[water] / day	5.19E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	U.S. EPA 1995b [in U.S. EPA 2005a]. Exception: (2,3,7,8- TCDF) U.S. EPA 2004 [in U.S. EPA 2005a].
Henry's Law Constant	Ratio of the aqueous-phase concentration of a chemical to its equilibrium partial pressure in the gas phase	Pa-m^3/mol	1.459	0.507	0.505	1.449	0.741	1.115	1.115	1.429	1.419	0.190	Mackay et al. 1992 [in U.S. EPA 2000b]. Exceptions: (1,2,3,7,8- PeCDF, 1,2,3,4,7,8- HxCDF, 1,2,3,7,8,9- HxCDF, 2,3,4,6,7,8- HxCDF, 1,2,3,4,6,7,8,9-OCDF) U.S. EPA 2000b [in U.S. EPA 2005a]
MeltingPoint	Temperature at which a solid becomes a liquid at standard atmospheric pressure	degrees K	500.7	499.2	469.4	499.2	505.7	520.7	512.7	509.7	495.2	532.2	Rodorf 1989 [in U.S. EPA 2000b]
molecularWeight	Molecular weight	g/mol	305.98	340.42	340.42	374.87	374.87	374.87	374.87	409.31	409.31	444.76	U.S. EPA 2000b [in U.S. EPA 2005a]
K_ow	Equilibrium ratio of concentration dissolved in octanol to concentration dissolved in water	L[water] / kg[octanol]	1.26E+06	6.17E+06	3.16E+06	1.00E+07	8.31E+07	3.80E+07	8.31E+07	2.51E+07	7.94E+06	1.00E+08	Mackay et al. 1992 [in U.S. EPA 2000b]. Exceptions: (1,2,3,7,8- PeCDF) Sijm et al. 1989 [in U.S. EPA 2000b], (1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9- HxCDF, 2,3,4,6,7,8-HxCDF) U.S. EPA 2000a, (1,2,3,4,7,8,9-HpCDF) Broman et al. 1991 [in Mackay 2006].
ReferenceBird_BodyWeight	Mass of individual reference bird used for allometric scaling of degradation rate	kg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	Nosek et al. 1992
ReferenceBird_General DegradationRate	First-order rate constant for chemical degradation in reference bird used for allometric scaling of degradation rate	1/day	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	Nosek et al. 1992
ReferenceBird_EliminationRate	First-order rate constant for elimination of chemical from the body (terrestrial birds)	1/day	0	0	0	0	0	0	0	0	0	0	Nosek et al. 1992
ReferenceMammal_BodyWeight	Mass of individual reference mammal used for allometric scaling of degradation rate	kg	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	Decad et al. 1981
ReferenceMammal_General DegradationRate	First-order rate constant for chemical degradation in reference mammal used for allometric scaling of degradation rate	1/day	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	Decad et al. 1981
ReferenceMammal_Elimination Rate	First-order rate constant for elimination of chemical from the body (terrestrial mammals)	1/day	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	Average of mean percent unabsorbed oral dose in Piper et al.1973

Source Inputs – Documentation for TRIM.FaTE Public Reference Library

TRIM.FaTE Property Name	Property Description	Units	Value Used	Reference
Source Inputs (all TRIM.FaTE source properties)				
emissionRate	Quantity of chemical emitted from the source per unit time	g/day	unset	n/a
X	Source location, x	spatial coordinates	unset	n/a
Y	Source location, y	spatial coordinates	unset	n/a
elevation	Source height	m	unset	n/a

"Unset" Inputs – Documentation for TRIM.FaTE Public Reference Library

TRIM.FaTE Compartment Type	TRIM.FaTE Property Name
All compartment types	Initial concentration (chemical-specific)
Benthic Invertebrate	Biomass per water area
Fish (all)[a]	Fraction diet
Fish (all)[a]	Population per water area
Leaf	Allow exchange
Leaf	Litter fall rate
Particle on Leaf	Allow exchange
Root - Nonwoody Plants Only	Allow exchange
Root Zone Soil	Organic carbon fraction
Sediment	Organic carbon fraction
Stem - Nonwoody Plants Only	Allow exchange
Surface Soil	Total erosion rate
Surface Soil	Total runoff rate
Surface Water - Pond	Algae density in water column
Surface Water - Pond	Chloride concentration
Surface Water - Pond	Chlorophyll concentration
Surface Water - Pond	Flush rate
Surface Water - Pond	Organic carbon fraction in suspended sediments
Surface Water - Pond	pH
Surface Water - Pond	Total suspended sediment concentration
Surface Water - Stream	Algae density in water column
Surface Water - Stream	Chloride concentration
Surface Water - Stream	Chlorophyll concentration
Surface Water - Stream	Current velocity
Surface Water - Stream	Flush rate
Surface Water - Stream	Organic carbon fraction in suspended sediments
Surface Water - Stream	pH
Surface Water - Stream	Total suspended sediment concentration
Vadose Zone Soil	Organic carbon fraction

[a] Includes Benthic Carnivore, Benthic Omnivore, Water-column Carnivore, Water-column Herbivore, and Water-column Omnivore.

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Attachment 1
Documentation of Food Ingestion Rate Values for Terrestrial and Semi-aquatic Animals

(1) Black-capped chickadee

Food ingestion rate: **0.74 kg[food wet wt]/kg[body weight (BW) wet]-day**

Smith (1993) reports that while no data on nutrition and food ingestion by black-capped chickadees are available, parids of comparable size require 10 kcal/day (41.8 kJ/day). Assuming that the chickadee diet consists 100 percent of insects, the chickadee wet body weight (BW) is 0.0108 kg (Dunning 1993), and energy and water content of insects are 22.1 kJ/g dry weight (5.28 kcal/g dry wt) and 76.3 percent, respectively (Bell 1990), daily food ingestion by chickadees would be 0.74 kg[food wet wt]/kg[BW wet]-day.

(2) Short-tailed shrew

Food ingestion rate: **0.47 kg[food wet wt]/kg[BW wet]-day**

The mean daily ingestion rate of shrews in Barrett and Stueck (1976) was 0.49 kg[food wet wt]/kg[BW wet]-day. The value of 0.47 that was included in the mercury test simulations is close to the value from Barrett and Stueck (1976). Caged shrews were fed mealworms, which have essentially the same water content as the natural prey of shrews.

(3) Meadow vole, Long-tailed vole

Food ingestion rate: **0.097 kg[food wet wt]/kg[BW wet]-day**

Food intake by meadow voles when exposed to 14-h days was 0.095 ± 0.002 (mean ± SE) kg[food wet wt]/kg[BW wet]-day; intake by individuals exposed to 10-h days was 0.085 ± 0.005 kg/kg-day (wet wt) (Dark et al. 1983). Mean food consumption by prairie voles (assumed to weigh 35 g; Burt and Grossenheider 1976) was 0.088 kg/kg-day (wet wt) and 0.12 kg/kg-day (wet wt) when ambient temperatures were 21 degrees and 28 degrees Celsius, respectively (Dice 1922).

(4) White-tailed deer

Food ingestion rate: **0.05 kg[food wet wt]/kg[BW wet]-day**

Mautz et al. (1976) reported a 1.74 kg/day diet for a 35 kg deer, which represents maintenance of the deer through the winter. There is no value adjustment for summer, because the energy required by females to thermoregulate and gestate in the winter might be roughly equivalent to the energy for late gestation and lactation.

(5) Tree swallow

Food ingestion rate: **0.198 kg[food wet wt]/kg[BW wet]-day**

Female tree swallows in New Brunswick, Canada in the summer were observed to require 5.73 ± 1.40 kJ/g-day (mean ± SD; n=10; Williams 1988). Using body weights reported in Williams (1988, 22.6 g), assuming that the diet consists exclusively of insects (Quinney and Ankney 1985), and that the energy and water content of insects are 22.09 kJ/g dry weight (5.28 kcal/g dry wt) and 76.3 percent, respectively (Bell 1990), daily food consumption by tree swallows is estimated to be 0.198 ± 0.048 kg[food wet wt]/kg[BW wet]-day. [Note: the calculation for food ingestion rate is incorrect; it should have been 0.34 kg/kg-day (wet wt).]

(6) White-footed mouse

Food ingestion rate: **0.20 kg[food wet wt]/kg[BW wet]-day**

Green and Millar (1987) observed an ingestion rate of 3.4 g/day, for laboratory mice fed Purina rat chow of an average weight of 21 g eating standard food, or a food ingestion rate of 0.16 kg[food dry wt]/kg[BW wet]-day. Body weight and gut dimensions of male and female mice did not differ, so data from both sexes were pooled (reported as g food consumed/individual-day). Food ingestion rate was normalized to body weight using body weights reported in study. The water content of Purina rat chow is approximately 0.10 (or 10 percent). The water content (WC) of the natural diet of white-footed mice is higher. Their diet includes seeds (WC of 0.09), vegetation (WC of 0.10 for mature dry grass, 0.7 to 0.88 for growing grasses), and soil arthropods (WC of 0.60 to 0.70) (U.S. EPA 1993). We assumed that the diet consists primarily of seeds and dry grasses (80 percent), but includes also soil arthropods (20 percent), for an overall moisture content of approximately 0.20. The wet food ingestion rate = the dry food ingestion rate divided by (1-WC), or in this case, the wet food ingestion rate = 0.20 kg[food wet wt]/kg[BW]-day (i.e., 0.16 kg[food dry wt]/kg[BW]-day/(1-0.20)).

(7) Long-tailed weasel

Food ingestion rate: **0.0735 kg[food wet wt]/kg[BW wet]-day**

Brown and Lasiewski (1972) reported the mean metabolism of male and female long-tailed weasels to be 1.36 ± 0.2 and 0.84 ± 0.12 (SE) kcal/hr, respectively. Assuming that male and female weasels weigh 0.297 kg and 0.153 kg (Brown and Lasiewski 1972), respectively, that the diet consists exclusively of small mammals with an energy content of 5163 kcal/kg (or 5.163 kcal/g) dry weight (Golley 1961), and that the water content of small mammals is 68 percent (U.S. EPA 1993), male and female weasels consume 0.067 and 0.080 kg[food wet wt]/kg[BW wet]-day, respectively.

(8) Red-tailed hawk

Food ingestion rate: **0.12 kg[food wet wt]/kg[BW wet]-day**

Preston and Beane (1993) cite a study (Craighead and Craighead 1956) in which males ate an average of 147 g/day (13 percent of body weight) and females an average of 136 g/day (11 percent of body weight) during fall-winter. Males ingested 82 g/day (7 percent of body weight), and females only 85 g/day (7 percent), during spring-summer. To be conservative, the fall-winter food ingestion rate (average of 12 percent) was used.

(9) Mallard

Food ingestion rate: **0.1 kg[food wet wt]/kg[BW wet]-day**

Heinz et al. (1987) report that mallards maintained in the laboratory consumed 0.1 kg[food dry wt]/kg[BW wet]-day. The water content of this diet (mostly seeds) ranged from 7-10 percent. Because the plant material consumed by mallards consists largely of seeds, and the mean water content of seeds is 9.3 percent (U.S. EPA 1993), the food ingestion rate used by Heinz may be used to represent the wet weight food ingestion rate without adjusting for water content.

(10) Mink

Food ingestion rate: **0.14 kg[food wet wt]/kg[BW wet]-day**

Bleavins and Aulerich (1981) reported a food ingestion rate of 0.14 kg[food wet wt]/kg[BW wet]-day for male and female mink in captivity. The diet consisted of chicken (20 percent), commercial mink cereal (17 percent), fish scraps (13 percent), beef parts, cooked eggs, powdered milk, and added water. The water content of that diet as fed to the mink was 66.2 percent, which is roughly equivalent to the water content of a natural mink diet.

(11) Raccoon

Food ingestion rate: **0.11 kg[food wet wt]/kg[BW wet]-day**

Using a body weight of 6.35 kg for an adult raccoon from U.S. EPA (1993) and the allometric equation for omnivorous mammals from Nagy et al. (1999), it is estimated that a raccoon would need 548 kcal daily or 86 kcal/kg-day. Assuming 0.95 kcal/g as an average gross energy content of the diet (wet wt), and an assimilation efficiency of 0.85, a raccoon would need 678 g of the diet daily, or 0.11 kg[food wet wt]/kg[BW wet]-day.

(12) Common loon

Food ingestion rate: **0.23 kg[food wet wt]/kg[BW wet]-day**

Assuming a diet of 100 percent fish, a gross energy content of 1.2 kcal/g[fish wet wt], and an energy assimilation efficiency of 79 percent for seabirds eating fish and using Nagy et al.'s (1999) allometric equation for seabirds consuming fish, we calculated a food ingestion rate for loons of 0.23 kg[food wet wt]/kg[BW wet]-day.

(13) Bald eagle

Food ingestion rate: **0.12 kg[food wet wt]/kg[BW wet]-day**

The value of 0.12 kg[food wet wt]/kg[BW wet] is for adults with an assumed body weight of 4.5 kg eating 100 percent fish. It is based on a field study conducted in the winter by Stalmaster and Gessaman (1984) where the eagles were provisioned with fish of known weights.

(14) Trowbridge shrew

Food ingestion rate: **1.17 kg[food wet wt]/kg[BW wet]-day**

The value is the mean of the values reported by Rust (1978) for captive shrews during their breeding (i.e., 0.91 ± 0.03 (mean ± SE) kg/kg-day) and non-breeding (i.e., 1.43 ± 0.10 (mean ± SE) kg/kg-day) seasons. The animals were fed a diet of beef brains and Purina cat chow.

(15) Mule deer/black-tailed deer

Food ingestion rate: **0.11 kg[food wet wt]/kg[BW wet]-day**

A food ingestion rate of 0.0219 ± 0.0011 (mean ± SE) kg[food dry wt]/kg[BW wet]-day was estimated by Alldredge et al. (1974) for 87 mule deer based on known Cs-137 concentrations in deer and forage. Given that the value represents ingestion of air-dried food, the ingestion rate should be adjusted for water content for use in TRIM.FaTE, in which food ingestion rate units are on a wet-weight basis. The moisture content of grasses and leaves of dichotomous plants (e.g., shrubs, deciduous trees) is highly variable, depending on the level of hydration of the plant. Young fresh grasses and leaves of hydrated dichotomous plants are approximately 80 percent water (professional judgment based on moisture content of fresh grasses of 70 percent, Davis and Golley 1963; fresh grasses 88 percent, Drozdz 1968; and dicot leaves 85 percent (± 3.5 percent SD, N = 3), Golley 1961). Thus, the food ingestion rate of 0.0219 kg[food *dry* wt]/kg[BW wet]-day is roughly equivalent to 0.11 kg[food *wet* wt]/kg[BW wet]-day for deer consuming fresh young grasses and leaves of deciduous trees.

(16) Kingfisher

Food ingestion rate: **0.35 kg[food wet wt]/kg[BW wet]-day**

Alexander (1977) estimated a food ingestion rate for belted kingfishers of 0.50 kg/kg-day in north central lower Michigan, but did not specify how he determined that value. Estimating the food ingestion rate based on Nagy's (1987) allometric equation for non-passerine birds (U.S. EPA's 1993 *Wildlife Exposure Factors Handbook*, Equation 3-5) results in an intake estimate of 0.0867 kg[food dry wt]/kg[BW wet]-day. Assuming that their food (fish) is 75 percent water, the estimated wet food ingestion rate would be 0.35 kg[food wet wt]/kg[BW wet]-day. Without further information on how Alexander (1977) estimated the 0.50 kg/kg-day value, we have selected the 0.35 kg/kg-day value for the food ingestion rate value for the belted kingfisher compartment in the TRIM.FaTE library.

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Attachment 2
Documentation of Total Elimination Rate Values for Mercury for Terrestrial and Semi-aquatic Animals

First-order rate constants used to derive the mercury elimination rate constants for wildlife in the current TRIM.FaTE library are summarized in Table 1. Supporting information is presented in the subsections that follow.

Table 1
Mean First-order Rate Constants (day^{-1}) for Elimination of Mercury from Birds and Mammals

	Chemical Species	Urine and Feces (E_{uf})	Lactation (E_{lact})	Eggs (E_{egg})	Fur, Feathers, or Hair (E_{ff})
mammals	Hg(2)	0.48[a]	0.00001	NA	0.00001
	Hg(0)	0.0502[b]	0[b]	NA	0[b]
	organic Hg	0.26[a]	0.00001[c]	NA	0.00014[d]
birds	Hg(2)	0.48[e]	NA	0[f]	0.00011[g]
	Hg(0)	0.0502[b]	NA	0[b]	0[b]
	organic Hg	0.0282[a]	NA	0.0244	0.0559

[a] Averages of elimination rate constants for oral and dietary doses.
[b] Rate constant based on inhalation study for mammals; same value assumed for birds.
[c] Assume same as lactation rate constant for Hg(2).
[d] Averages of elimination rate constants for oral dose and injection.
[e] Assume same as elimination rate constant to mammalian urine and feces.
[f] No information available.
[g] Assume same as elimination rate constant to mammal fur.

For each mercury species, the total elimination rate constant for birds or mammals is equal to the sum of the excretion rate constants in Table 1 for urine and feces; lactation (mammals), and fur, hair (mammals), or feathers (birds). In the current TRIM.FaTE library, chemical excretion to eggs is assumed to remain within the bird population compartment, hence it is not included in the total bird elimination rate constant for organic mercury.

Elemental Mercury

Elemental mercury vapor is rapidly absorbed in the lungs (75 to 85 percent in humans), and to a much lesser extent (three percent), it can be absorbed dermally (ATSDR 1997, U.S. EPA 1997). Five human subjects inhaled from 107 to 202 :g[Hg]/m^3[air] and retained an average of 74 percent of the dose (Teisinger and Fiserova-Bergerova 1965). The inhaled vapor readily distributes throughout the body and can cross the blood-brain and placental barriers.

Rats exposed for 5 hours to 1.4 mg/m^3 radio-labeled mercury vapor retained an average body burden of 0.256 mg/kg BW (37 :g[Hg]/rat) and had excreted (urine and feces) 8.5 percent of the initial body burden in 1 day, 24.8 percent in 5 days, and 42.9 percent in 15 days (Hayes and Rothstein 1962). Cherian et al. (1978) exposed 5 human volunteers to approximately 1 :Ci of radio-labeled Hg vapor for approximately 19 minutes. Mean cumulative excretion over the first 7 days after exposure was 2.4 percent of the retained dose in urine and 9.2 percent in feces for a total excretion of 11.6 percent of the retained dose (Cherian et al. 1978).

Rates of excretion of elemental mercury by mammals (rats and humans) are summarized in Table 2 (mean value presented in Table 1). No information on excretion by avian species is available.

Table 2
Excretion of Inhaled Elemental Mercury (Hg^o) in Mammals

Test Species	Dose	Elimination Route	Percent of Dose	Days	Rate Constant (Day^{-1})	Source
Rat	0.256 mg/kg	urine + feces	8.5	1	0.08883	Hayes & Rothstein 1962
Rat	0.256 mg/kg	urine + feces	24.8	5	0.05700	Hayes & Rothstein 1962
Rat	0.256 mg/kg	urine + feces	42.9	15	0.03736	Hayes & Rothstein 1962
Human	1 :Ci	urine + feces	11.6	7	0.01761	Cherian et al. 1978
			0 $\pm$ SE		**0.05020 $\pm$ 0.01518**	

Divalent Mercury

Divalent mercury can be absorbed through oral, dermal, and inhalation routes; however, absorption is lower than for elemental mercury by all routes. In mice, only 20 percent of the administered dose is absorbed from the GI tract, 2-3 percent of the dose was absorbed dermally in exposed guinea pigs, and limited information on inhalation exposure indicates that 40 percent of the dose was absorbed in the lungs of dogs (U.S. EPA 1997). Additionally, the absorption of mercuric salts varies with the solubility of the specific salt. For example, the less soluble sulfide salt is more poorly absorbed as mercuric sulfide than the more soluble chloride salt as mercuric chloride (U.S. EPA 1997). Divalent mercury distributes widely throughout the body; however, it cannot cross the blood-brain or placental barriers.

The metabolism and distribution of mercuric chloride ($HgCl_2$) has been described in dairy cows and rats. Potter et al. (1972) orally administered 344 :Ci of radio-labeled mercuric chloride by gelatin capsule using balling gum to 2 Holstein cows. After 6 days, 94.87 percent of the dose was excreted in feces, 0.044 percent in urine, and 0.0097 percent in milk, for a total excretion of 94.92 percent of the dose. The biological half-life was calculated as 28.5 hours. Rats dosed by intravenous injection with 1 mg[Hg]/kg[body weight] mercuric chloride excreted 15.2 percent of the dose in feces and 16.3 percent in urine over 4 days for a total excretion (fecal and urinary) of 31.5 percent of the administered dose in 4 days (Gregus and Klaassen 1986).

The metabolism and distribution of mercuric nitrate [$Hg(NO_3)_2$] have also been described for dairy cows and rats. Four Holstein dairy cows were given an oral dose of 1.7 mCi radio-labeled $Hg(NO_3)_2$ in a gelatin capsule via balling gum. Urine, feces, and milk were collected for 10 days and analyzed. Results indicated that 74.91 percent of the administered dose was excreted in feces, 0.08 percent in urine, and 0.01 percent in milk with a total excretion of

75 percent of the dose in 10 days (Mullen et al. 1975). Mullen et al. (1975) also reported a biological half-life for the transfer of orally ingested mercury to milk of 5 days. Transfer of mercury to feces was slightly more complicated with an initial half-life of 15 hr (probably reflecting the unabsorbed dose), then a decrease in elimination time which resulted in a 3 day half-life (probably representing excretion of the absorbed dose) (Mullen et al. 1975). Rothstein and Hayes (1960) dosed 7 Wistar rats with 50 :g (0.2 mg[Hg]/kg[body wt]) radio-labeled mercury as $Hg(NO_3)_2$ via intravenous injection. After 52 days the cumulative percent excretion was 25 percent of the administered dose in urine and 37 percent in feces for a total excretion of 62 percent of the injected dose over 52 days (Rothstein and Hayes 1960). In another study, 6 Holtzman rats were dosed by subcutaneous injection with 20 :Ci of radio-labeled $Hg(NO_3)_2$, and 0.018 percent of the dose was recovered in the hair 20 days after administration (Mansour et al. 1973). For pregnant female rats, a clearance half-time of 16.2 days was also reported (18 measurements over a 3-week period).

Fitzhugh et al. (1950) exposed rats (20/dose group) to mercuric acetate in the diet at concentrations of 0.5, 2.5, 10, 40, and 160 ppm Hg. The average intake of Hg in a 24-hour period was 7.5, 37.5, 150, 600, and 2,400 :g per rat, and the 24-hour excretion was 52, 40, 43, 47, and 43 percent of those doses, respectively, in feces and 4.8, 1.0, 0.5, 0.37, and 1.7 percent, respectively, in urine (Fitzhugh et al. 1950).

Divalent mercury is poorly absorbed from the GI tract (20 percent, see above), therefore, elimination rates obtained from oral or dietary exposure may be misleading. Hayes and Rothstein (1962) reported an initial half-life for fecal elimination of inorganic mercury of 0.6 days in Holstein cows. Later, the half-life increased to 3 days, as in the study by Mullen et al. (1975) . This indicates that a large proportion of the dose is initially excreted via the feces due to lack of absorption. In the current TRIM.FaTE library, the elimination rate constant for terrestrial wildlife represents the elimination of both absorbed and unabsorbed mercury in feces (and urine). As long as the concentration of mercury in the tissues of the wildlife (birds and mammals) is not needed for the risk assessment, these elimination rates can be used for purposes of estimating the transfer of ingested mercury from wildlife to surface soil and water by setting the assimilation efficiency property in the wildlife compartment to 1.0. However, if the concentration of Hg in the animals tissues is needed for the risk assessment (e.g., to track risks to humans that consume meat from deer or cows in the modeling region), it would be necessary to determine a true assimilation efficiency to estimate the proportion of the ingested mercury that is absorbed by the animal. Then, separate rate constants and algorithms would be needed to track separately the elimination of the absorbed mercury and unabsorbed mercury.

Rates of excretion of divalent mercury by mammals (rats and cows) are summarized in Table 3 (mean values for excretion to urine and feces, lactation, and excretion to hair presented in Table 1). No information on excretion by avian species is available.

Table 3
Excretion of Divalent Mercury in Mammals

Test Species[a]	Form	Dose	Dose[b] Route	Elimination Route	Percent of Dose	Days	Rate (Day^{-1})	Dose Vehi-cle	Source
Cow-Holstein	$HgCl_2$	344 :Ci	oral	urine + feces	94.91	6	0.49632	gel cap	Potter et al. 1972
Cow-Holstein	$Hg(NO_3)_2$	1.7 mCi	oral	urine + feces	74.99	10	0.13859	gel cap	Mullen et al. 1975
					0 ± SE		**0.31745 ± 0.17886**		
Rat-SD	$HgCl_2$	1 mg/kg	iv	urine + feces	31.5	4	0.09458	saline sol	Gregus & Klaassen 1986
Rat-Wistar	$Hg(NO_3)_2$	50 :g	iv	urine + feces	62	52	0.01861	sodium chloride	Rothstein & Hayes 1960
					0 ± SE		**0.05660 ± 0.03798**		
Rat	mercuric acetate	7.5 :g	diet	urine + feces	56.8	1	0.83933	food	Fitzhugh et al. 1950
Rat	mercuric acetate	37.5 :g	diet	urine + feces	41.0	1	0.52763	food	Fitzhugh et al. 1950
Rat	mercuric acetate	150 :g	diet	urine + feces	43.5	1	0.57093	food	Fitzhugh et al. 1950
Rat	mercuric acetate	600 :g	diet	urine + feces	47.37	1	0.64188	food	Fitzhugh et al. 1950
Rat	mercuric acetate	2400 :g	diet	urine + feces	44.7	1	0.59240	food	Fitzhugh et al. 1950
					0 ± SE		**0.63443 ± 0.05443**		
Cow-Holstein	$HgCl_2$	344 :Ci	oral	milk	0.0097	6	0.00002	gel cap	Potter et al. 1972
Cow-Holstein	$Hg(NO_3)_2$	1.7 mCi	oral	milk	0.01	10	0.00001	gel cap	Mullen et al. 1975
					0 ± SE		**0.00001 ± 0.000003**		
Rat-Holtz-man	$Hg(NO_3)_2$	20 :g	sc inj	hair	0.018	20	0.00001	injec-tion	Mansour et al. 1973

[a] Rat-SD = Sprague Dawley rat
[b] iv = Intravenous injection and sc inj = subcutaneous injection.

Organic Mercury

Organic mercury is by far the most studied species of mercury. It is rapidly and extensively absorbed through the GI tract (95 percent of the dose in humans) and is distributed throughout the body via carrier-mediated transport (U.S. EPA 1997). Like elemental mercury, organic mercury can cross the blood-brain and placental barriers.

Radio-labeled methylmercuric chloride was intravenously injected into 6 pregnant Holtzman rats at a dose of 10 :Ci; after 20 days, 0.21 percent of the administered dose was transferred to hair. The whole-body clearance half-life was reported to be 8.4 days (Mansour et al. 1973). Gregus and Klaassen (1986) also administered radio-labeled methylmercuric chloride via intravenous injection to Sprague-Dawley rats at a dose of 1 mg[Hg]/kg[body wt]. Within 4 days, 5.6 percent of the injected dose was excreted in feces and 0.5 percent in urine for a total excretion of 6.1 percent of the administered dose. Additionally, 2-hr biliary excretion was 0.7, 0.9, 0.7, and 0.5 percent of doses at 0.1, 0.3, 1.0, and 3.0 mg[Hg]/kg[body wt], respectively (Gregus and Klaassen 1986). Syrian Golden hamsters (N = 9) were given an oral dose of 0.32 mg[Hg]/kg[body wt] as radio-labeled methylmercury chloride, and the elimination rate was found to follow a first-order rate equation with a half-life of 6.9 days (Nordenhäll et al. 1995). Nordenhäll et al. (1995) estimated that approximately 5 percent of the oral dose administered to the dams was transferred to pups via milk over 21 days. Four days after oral administration of methylmercury chloride, 20 percent of the mercury in milk was inorganic (Nordenhäll et al. 1995). Sell and Davison (1975) dosed via intraruminal injection, 1 Nubian goat and 1 Guernsey cow with 100 and 500 :Ci radio-labeled methylmercury chloride, respectively. After 13 days, 0.28, 31.18, and 1.45 percent of the dose administered to the goat were excreted in milk, feces, and urine, respectively. Conversely, *none of the dose* was excreted in cow milk, 25.32 percent was excreted in cow feces, and 1.28 percent was excreted in cow urine after 7 days.

Takeda and Ukita (1970) exposed Donryu rats to 20 :g[Hg]/kg[body wt] as radio-labeled ethyl-mercuric chloride dissolved in olive oil by subcutaneous injection. Cumulative excretion during 8 days post-exposure was 10.52 percent of dose in urine and 6.01 percent of dose in feces. In urine, 41.9 percent and 58.1 percent of the total mercury was organic and inorganic, respectively, on day 8. In contrast, 65 percent of fecal mercury was organic and 35 percent was inorganic on day 8 (Takeda and Ukita 1970). Fang and Fallin (1973) orally dosed 14 rats with 3 :mol radio-labeled ethyl-mercuric chloride in corn oil. Mercury content was measured in 1-2 rats on days 0.25, 1, 2, 3, 4, 5, 7, 10, and 14 after dosing. Fourteen days after dosing, 32.5 nmole/g hair had accumulated in the fur. Wistar rats have an estimated 3 g of fur (Talmage 1999), therefore, approximately 3.25 percent of the original dose was excreted in fur.

Fitzhugh et al. (1950) exposed rats (20/dose group) to phenyl mercuric acetate in the diet at doses of 0.5, 2.5, 10, 40, and 160 ppm [Hg]. The average intake of Hg in a 24-hour period was 7.5, 37.5, 150, 600, and 2,400 :g and the 24-hour excretion was 44, 35, 27, 35, and 30 percent of those doses, respectively, in feces and 9.2, 4.5, 6.2, 4.3, and 2.4 percent, respectively, in urine (Fitzhugh et al. 1950).

Humans also have been used as subjects for studying the metabolism of methylmercury. Three subjects were given an oral dose of 2.6 :Ci radio-labeled methylmercuric nitrate (Aberg et al. 1969). Mean cumulative mercury excretion values 10 days post-exposure were 13.6 percent

, 13, and 14.2 percent) of the dose in feces and 0.24 percent (0.18, 0.26, and 0.27 percent) in urine. After 49 days, 34.1 percent (33.4 and 34.7 percent) of the initial dose was excreted via feces and 3.31 percent (3.29 and 3.33 percent) via urine (Aberg et al. 1969). Aberg et al. (1969) also reported the biological half-life of methylmercuric chloride to be 70.4, 74.2, and 73.7days (0 = 72.8 days) for the three subjects and measured approximately 0.12 percent of the initial dose in hair approximately 45 days (range 40-50 days) after exposure.

Two papers contained data suitable for use in determining excretion rates for avian species. In the first study, Lewis and Furness (1991) orally dosed black-headed gulls with 200, 100, or 20 :L methylmercuric chloride using gelatin capsules. The cumulative excretion of mercury for the 200 :L group was 26.4 percent of the dose in urine/feces and 51.2 percent in feathers for a total of 77.5 percent eliminated from the body over 13 days. At the 100 :L dose, a total of 80.3 percent of the dose was eliminated (37.8 and 44.2 percent in urine/feces and feathers, respectively) in 13 days. Finally, only 56.3 percent of the low dose was measured in urine/feces and feathers, with 11 percent of the dose in urine/feces and 52.6 percent in feathers after 13 days (Lewis and Furness 1991).

In the second study, 4 white-leghorn chickens and 4 Japanese quail were administered 20 ppm Hg as methylmercuric chloride in the diet for 21 days (Sell 1977). During the first 7 days of this dosing period, chickens and quail were also given an oral dose of 2 :Ci of radio-labeled methylmercuric chloride (Sell 1977). The rate calculations reported in Table A-18 assume that the author accounted for the total intake of radio-labeled mercury from both sources when reporting percent of dose excreted in feces and eggs. Chickens excreted 64 percent of the dose in urine/feces and 22 percent of the dose in eggs produced during the 21 days post-exposure, while quail excreted 41 and 54 percent of the dose in urine/feces and eggs, respective, during the same 21 day post-exposure period (Sell 1977).

Rates of excretion of organic mercury by mammals (humans, goats, cows, and rats) are summarized in Table 4, and rates of excretion by birds are summarized in Table 5 (mean values for excretion to urine and feces, fur, feathers, and eggs presented in Table 1). No information on excretion by avian species is available.

Table 4
Excretion of Organic Mercury in Mammals

Test Species[1]	Form	Dose	Dose[2] Route	Elimination Route	Percent of Dose	Days	Rate (Day^{-1})	Dose Vehicle	Source
Human	methylmercuric nitrate	2.6 :Ci	oral	urine + feces	13.84	10	0.01490	aq sol	Aberg et al. 1969
Human	methylmercuric nitrate	2.6 :Ci	oral	urine + feces	37.41	49	0.00956	aq sol	Aberg et al. 1969
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	urine + feces	0.67	1	0.00672	ethanol	Sell & Davison 1975
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	urine + feces	17.19	3	0.06287	ethanol	Sell & Davison 1975
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	urine + feces	22.62	5	0.05129	ethanol	Sell & Davison 1975
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	urine + feces	25.72	7	0.04248	ethanol	Sell & Davison 1975
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	urine + feces	31.63	13	0.02925	ethanol	Sell & Davison 1975
Cow-Guernsey	CH_3-HgCl	500 :Ci	ir inj	urine + feces	4.80	1	0.04919	ethanol	Sell & Davison 1975
Cow-Guernsey	CH_3-HgCl	500 :Ci	ir inj	urine + feces	18.86	3	0.06966	ethanol	Sell & Davison 1975
Cow-Guernsey	CH_3-HgCl	500 :Ci	ir inj	urine + feces	23.05	5	0.05240	ethanol	Sell & Davison 1975
Cow-Guernsey	CH_3-HgCl	500 :Ci	ir inj	urine + feces	26.60	7	0.04418	ethanol	Sell & Davison 1975
					0 ± SE		**0.03932 ± 0.00644**		
Rat-SD	CH_3-HgCl	1 mg/kg	iv	urine + feces	6.1	4	0.01573	saline sol	Gregus & Klaassen 1986
Rat-Donryu	ethyl-$HgCl_2$	20 :g/kg	sc inj	urine + feces	16.53	8	0.02259	olive oil	Takeda & Ukita 1970
					0 ± SE		**0.01916 ± 0.00343**		
Rat	phenyl mercuric acetate	7.5 :g	diet	urine + feces	53.2	1	0.75929	food	Fitzhugh et al. 1950
Rat	phenyl mercuric acetate	37.5 :g	diet	urine + feces	39.5	1	0.50253	food	Fitzhugh et al. 1950
Rat	phenyl mercuric acetate	150 :g	diet	urine + feces	33.2	1	0.40347	food	Fitzhugh et al. 1950
Rat	phenyl mercuric acetate	600 :g	diet	urine + feces	39.3	1	0.49923	food	Fitzhugh et al. 1950
Rat	phenyl mercuric acetate	2400 :g	diet	urine + feces	32.4	1	0.39156	food	Fitzhugh et al. 1950
					0 ± SE		**0.51121 ± 0.06621**		

Table 4 (continued)
Excretion of Organic Mercury in Mammals

Test Species[1]	Form	Dose	Dose[2] Route	Elimination Route	Percent of Dose	Days	Rate (Day^{-1})	Dose Vehicle	Source
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	milk	0.08	3	0.00027	ethanol	Sell & Davison 1975
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	milk	0.14	5	0.00028	ethanol	Sell & Davison 1975
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	milk	0.19	7	0.00027	ethanol	Sell & Davison 1975
Goat-Nubian	CH_3-HgCl	100 :Ci	ir inj	milk	0.28	13	0.00022	ethanol	Sell & Davison 1975
					0 ± SE		**0.00026 ± 0.00001**		
Human	methylmercuric nitrate	2.6 :Ci	oral	hair	0.12	45	0.00003	aq sol	Aberg et al. 1969
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	0.05	0.25	0.00200	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	0.14	1	0.00140	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	0.18	2	0.00090	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	0.52	3	0.00174	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	0.59	4	0.00148	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	0.67	5	0.00134	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	1.08	7	0.00155	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	2.25	10	0.00228	corn oil	Fang & Fallin 1973
Rat-Wistar	ethyl-$HgCl_2$	3 :mole	oral	hair	5.50	14	0.00404	corn oil	Fang & Fallin 1973
					0 ± SE		**0.00168 ± 0.00033**		
Rat-Holtzman	CH_3-HgCl	10 :Ci	iv	hair	0.21	20	0.00011		Mansour et al. 1973

[1] Rat-SD = Sprague Dawley rat
[2] ir = Intraruminal injection, iv = intravenous injection and sc inj = subcutaneous injection.

Table 5
Excretion of Organic Mercury in Birds

Test Species[a]	Form	Dose	Dose Route	Elimination Route	Percent of Dose	Days	Rate (Day^{-1})	Dose Vehi-cle	Source
Gull-BH	methyl-HgCl	200 :L	oral	feces	26.4	13	0.02358	gel cap	Lewis & Furness 1991
Gull-BH	methyl-HgCl	100 :L	oral	feces	37.7	13	0.03640	gel cap	Lewis & Furness 1991
Gull-BH	methyl-HgCl	20 :L	oral	feces	11	13	0.00896	gel cap	Lewis & Furness 1991
					0 + SE		**0.02298 + 0.00793**		
Chicken-WL	methyl-HgCl	20 ppm + 2 :Ci	diet/orl	feces	64	21	0.04865	food	Sell 1977
Quail-Japanese	methyl-HgCl	20 ppm + 2 :Ci	diet/orl	feces	32	21	0.01836	food	Sell 1977
					0 + SE		**0.03351 + 0.01514**		
Gull-BH	methyl-HgCl	200 :L	oral	feathers	51.2	13	0.05519	gel cap	Lewis & Furness 1991
Gull-BH	methyl-HgCl	100 :L	oral	feathers	44.2	13	0.04488	gel cap	Lewis & Furness 1991
Gull-BH	methyl-HgCl	20 :L	oral	feathers	52.6	13	0.05743	gel cap	Lewis & Furness 1991
					0 + SE		**0.05593 + 0.00075**		
Chicken-WL	methyl-HgCl	20 ppm + 2 :Ci	diet/orl	eggs	21.88	21	0.01176	food	Sell 1977
Quail-Japanese	methyl-HgCl	20 ppm + 2 :Ci	diet/orl	eggs	54.08	21	0.03706	food	Sell 1977
					0 + SE		**0.02441 + 0.01265**		

[a] Gull-BH = Black-headed gull, Chicken-WL = White- leghorn chicken.

References for Attachment 2

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