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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	0.11 x BW B $^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.23E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.62E-03	mg	0.5 × SA B (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.74E+01	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.23E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	2.86E-02	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.86E+00	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.23E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.32E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.66E+00	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.65E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	5.16E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.65E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.08E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	2.64E+01	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	3.62E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	0.398 x BW SAi $^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.48E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.19E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.48E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	7.12E+00	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.23E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.32E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.66E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.32E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	$0.0687 \times BW\ Mc^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	$0.11 \times BW\ SM^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.23E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.32E-02	mg	$0.5 \times SA\ SM\ (cm^2) \times R\ (mg/cm^2)$
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.66E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.32E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.526	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	526	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0498	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.34E-02	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.526	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	526	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0498	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	7.29E-03	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.65E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	5.67E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.77E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.65E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	5.67E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.06E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.64E+01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	9.07E+00	mg/kg	C_0 (mg/kg) × (1-e$^{-K (1/day) \times T (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.24E+00	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	$0.398 \times BW\ SAh^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.60E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	8.96E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.80E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.60E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	8.96E-03	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.67E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	4.16E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.43E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.97E-02	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.39E-09	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	7.55E-10	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.00388	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.00E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.51E-11	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.00388	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.00E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.69E-12	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute Exposures (On-Site)				
Direct Spray				
Bee	F01a	1.74E+01	1,075	1.62E-02
Small Bird	F01b	2.86E+00	2,250	1.27E-03
Small Mammal	F01c	2.66E+00	104	2.56E-02
Ingestion of Contaminated Vegetation				
Small Avian Herbivore	F02a	5.16E-01	2,250	2.29E-04
Small Mammal Herbivore	F02b	3.08E-01	104	2.96E-03
Large Mammal Herbivore	F02c	3.62E+00	104	3.48E-02
Ingestion of Contaminated Insects				
Small Avian Insectivore	F03a	1.19E+01	2,250	5.30E-03
Small Mammal Insectivore	F03b	7.12E+00	104	6.85E-02
Ingestion of Contaminated Small Mammals				
Avian Carnivore	F04a	5.32E-02	2,250	2.37E-05
Mammalian Carnivore	F04b	5.32E-02	104	5.12E-04
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	1.34E-02	2,250	5.97E-06
Small Mammal Herbivore	F05b	7.29E-03	104	7.01E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Insects	1,075	USEPA, 2005d (see Table 3-2)
Toxicity (NOEC) for Birds	2,250	USEPA 2005d (see Table 3-2)
Toxicity (NOAEL) for Mammals	104	USEPA, 2005d

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Vegetation (On-Site)				
Small Avian Herbivore	F06a	1.77E-01	22.5	7.89E-03
Small Mammal Herbivore	F06b	1.06E-01	50	2.12E-03
Large Mammal Herbivore	F06c	1.24E+00	50	2.49E-02
Ingestion of Contaminated Vegetation (Off-Site)				
Small Avian Herbivore	F07a	2.80E-03	22.5	1.25E-04
Small Mammal Herbivore	F07b	1.67E-03	50	3.35E-05
Large Mammal Herbivore	F07c	1.97E-02	50	3.93E-04
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	1.39E-09	22.5	6.18E-11
Small Mammal Herbivore	F08b	7.55E-10	50	1.51E-11
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	1.51E-11	22.5	6.71E-13
Mammalian Piscivore	F09b	1.69E-12	50	3.38E-14

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEC) for Birds	22.5	Estimated from acute NOEC
Toxicity (NOAEL) for Mammals	50	USEPA, 2005d

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	4.98E-02	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	100	NOEC	USEPA, 2005d (see Table 3-2)	4.98E-04
Aquatic Invertebrates, Acute Exposures	98.6	NOEC	USEPA, 2005d	5.05E-04
Aquatic Amphibians, Acute Exposures	95.2	NOEC	USEPA, 2005d (see Table 3-2)	5.23E-04
Aquatic Plants				
Algae, Acute Exposures	6	NOEC	USEPA, 2005d	8.30E-03
Macrophytes, Acute Exposures	44	NOEC	USEPA, 2005d	1.13E-03

Notes:

-- No toxicity information identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	5.15E-09	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	1.36	NOEC	USEPA, 2005d	3.79E-09
Aquatic Invertebrates, Chronic Exposures	102	NOEC	USEPA, 2005d	5.05E-11
Aquatic Amphibians, Chronic Exposures	0.952	NOEC	Estimated from acute NOEC	5.41E-09
Aquatic Plants				
Algae, Chronic Exposures	6	NOEC	USEPA, 2005d	8.59E-10
Macrophytes, Chronic Exposures	44	NOEC	USEPA, 2005d	1.17E-10

Notes:

-- No toxicity information identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
	Application Rate #1 (Units Converted)	1.37E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.74E-04		
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.81E-04	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Amt B 2	Application Rate #2	3.61E-04		
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.94E+00	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)
Dose 2	Application Rate #2	3.88E+00		

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
	Application Rate #1 (Units Converted)	1.37E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.74E-04		
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	3.18E-03	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Amt SB 2	Application Rate #2	6.37E-03		
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	3.18E-01	mg/kg/day	Amt SB (mg) /
Dose 2	Application Rate #2	6.37E-01		BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
	Application Rate #1 (Units Converted)	1.37E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.74E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.93E-03	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.19E-02		
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.96E-01	mg/kg/day	Amt SM (mg) /
Dose 2	Application Rate #2	5.93E-01		BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.83E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	3.67E-01		
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	5.74E-02	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)
Dose 2	Application Rate #2	1.15E-01		

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.83E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	3.67E-01		
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.43E-02	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)
Dose 2	Application Rate #2	6.86E-02		

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	2.93E+00	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
C SG 2	Application Rate #2	5.87E+00		
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	4.03E-01	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)
Dose 2	Application Rate #2	8.05E-01		

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.65E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	3.30E+00		
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.33E+00	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)
Dose 2	Application Rate #2	2.66E+00		

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.65E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	3.30E+00		
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	7.93E-01	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)
Dose 2	Application Rate #2	1.59E+00		

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
	Application Rate #1 (Units Converted)	1.37E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.74E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.93E-03	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.19E-02		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.96E-01	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	5.93E-01		
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.93E-03	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)
Dose 2	Application Rate #2	1.19E-02		

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
	Application Rate #1 (Units Converted)	1.37E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.74E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.93E-03	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.19E-02		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.96E-01	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	5.93E-01		
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.93E-03	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)
Dose 2	Application Rate #2	1.19E-02		

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.146	mg/mL	See Section 2
C F 2	Application Rate #2	0.293		
	Application Rate #1 (Units Converted)	146	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	293		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0139	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.0277		
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.74E-03	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	7.48E-03		

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.146	mg/mL	See Section 2
C F 2	Application Rate #2	0.293		
	Application Rate #1 (Units Converted)	146	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	293		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0139	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.0277		
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	2.03E-03	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	4.06E-03		

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.83E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	3.67E-01		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.72E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.54E-01		
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.42E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	4.83E-02		

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.83E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	3.67E-01		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.72E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.54E-01		
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.44E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	2.88E-02		

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.93E+00	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.87E+00		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.23E+00	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	2.47E+00		
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.69E-01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	3.39E-01		

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	$0.398 \times BW\ SAh^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.90E-03	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.80E-03		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.22E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	2.44E-03		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.82E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	7.63E-04		

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.90E-03	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.80E-03		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.22E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	2.44E-03		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.28E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	4.56E-04		

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	4.64E-02	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	9.27E-02		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.95E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	3.90E-02		
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	2.68E-03	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	5.35E-03		

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.94E-09	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	3.87E-09		

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.05E-09	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	2.10E-09		

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(BW\ Ap)(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.102	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	7.34E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.47E-09		
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	5.54E-10	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)
Dose 2	Application Rate #2	1.11E-09		

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.102	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	7.34E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.47E-09		
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	6.21E-11	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)
Dose 2	Application Rate #2	1.24E-10		

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Acute Exposures (On-Site)						
Direct Spray						
Bee	F01a	1.94E+00	3.88E+00	268.8	7.23E-03	1.45E-02
Small Bird	F01b	3.18E-01	6.37E-01	1,686	1.89E-04	3.78E-04
Small Mammal	F01c	2.96E-01	5.93E-01	165	1.80E-03	3.59E-03
Ingestion of Contaminated Vegetation						
Small Avian Herbivore	F02a	5.74E-02	1.15E-01	1,686	3.41E-05	6.81E-05
Small Mammal Herbivore	F02b	3.43E-02	6.86E-02	165	2.08E-04	4.15E-04
Large Mammal Herbivore	F02c	4.03E-01	8.05E-01	165	2.44E-03	4.88E-03
Ingestion of Contaminated Insects						
Small Avian Insectivore	F03a	1.33E+00	2.66E+00	1,686	7.88E-04	1.58E-03
Small Mammal Insectivore	F03b	7.93E-01	1.59E+00	165	4.81E-03	9.62E-03
Ingestion of Contaminated Small Mammals						
Avian Carnivore	F04a	5.93E-03	1.19E-02	1,686	3.52E-06	7.03E-06
Mammalian Carnivore	F04b	5.93E-03	1.19E-02	165	3.59E-05	7.19E-05
Ingestion of Contaminated Surface Water						
Small Avian Herbivore	F05a	3.74E-03	7.48E-03	1,686	2.22E-06	4.43E-06
Small Mammal Herbivore	F05b	2.03E-03	4.06E-03	165	1.23E-05	2.46E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Insects	268.8	USDA, 2004d (see Table 3-2)
Toxicity (NOEC) for Birds	1,686	USDA, 2004d
Toxicity (NOAEL) for Mammals	165	USDA, 2004d

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Chronic Exposures (On-Site and Off-Site)						
Ingestion of Contaminated Vegetation (On-Site)						
Small Avian Herbivore	F06a	2.42E-02	4.83E-02	140	1.73E-04	3.45E-04
Small Mammal Herbivore	F06b	1.44E-02	2.88E-02	5	2.88E-03	5.77E-03
Large Mammal Herbivore	F06c	1.69E-01	3.39E-01	5	3.39E-02	6.78E-02
Ingestion of Contaminated Vegetation (Off-Site)						
Small Avian Herbivore	F07a	3.82E-04	7.63E-04	140	2.73E-06	5.45E-06
Small Mammal Herbivore	F07b	2.28E-04	4.56E-04	5	4.56E-05	9.12E-05
Large Mammal Herbivore	F07c	2.68E-03	5.35E-03	5	5.35E-04	1.07E-03
Ingestion of Contaminated Surface Water (Off-Site)						
Small Avian Herbivore	F08a	1.94E-09	3.87E-09	140	1.38E-11	2.76E-11
Small Mammal Herbivore	F08b	1.05E-09	2.10E-09	5	2.10E-10	4.20E-10
Ingestion of Contaminated Fish (Off-Site)						
Avian Piscivore	F09a	5.54E-10	1.11E-09	140	3.96E-12	7.92E-12
Mammalian Piscivore	F09b	6.21E-11	1.24E-10	5	1.24E-11	2.48E-11

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEC) for Birds	140	USDA, 2004d
Toxicity (NOAEL) for Mammals	5	USDA, 2004d

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Acute	1.39E-02	2.77E-02	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Acute Exposures	30	NOEC	USDA, 2004d	4.62E-04	9.24E-04
Aquatic Invertebrates, Acute Exposures	10	NOEC	USDA, 2004d	1.39E-03	2.77E-03
Aquatic Amphibians, Acute Exposures	--	--	--	--	--
Aquatic Plants					
Algae, Acute Exposures	0.0094	NOEC	USEPA, 2005c	1.47E+00	2.95E+00
Macrophytes, Acute Exposures	0.00024	NOEC	USEPA, 2005c	5.78E+01	1.16E+02

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	7.18E-09	1.44E-08	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Chronic Exposures	32	NOEC	USDA, 2004d	2.24E-10	4.48E-10
Aquatic Invertebrates, Chronic Exposures	20	NOEC	USEPA, 2005c	3.59E-10	7.18E-10
Aquatic Amphibians, Chronic Exposures	--	--	--	--	--
Aquatic Plants					
Algae, Chronic Exposures	0.0094	NOEC	USEPA, 2005c	7.64E-07	1.53E-06
Macrophytes, Chronic Exposures	0.00024	NOEC	USEPA, 2005c	2.99E-05	5.98E-05

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
	Application Rate #1 (Units Converted)	5.52E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.63E-03		
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	7.28E-03	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Amt B 2	Application Rate #2	3.47E-03		
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	7.83E+01	mg/kg/day	Amt B (mg) /
Dose 2	Application Rate #2	3.73E+01		BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
	Application Rate #1 (Units Converted)	5.52E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.63E-03		
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	1.28E-01	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Amt SB 2	Application Rate #2	6.11E-02		
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.28E+01	mg/kg/day	Amt SB (mg) /
Dose 2	Application Rate #2	6.11E+00		BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
	Application Rate #1 (Units Converted)	5.52E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.63E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	2.39E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.14E-01		
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.19E+01	mg/kg/day	Amt SM (mg) /
Dose 2	Application Rate #2	5.69E+00		BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	7.39E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	3.52E+00		
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.31E+00	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)
Dose 2	Application Rate #2	1.10E+00		

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	7.39E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	3.52E+00		
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.38E+00	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)
Dose 2	Application Rate #2	6.58E-01		

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	1.18E+02	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
C SG 2	Application Rate #2	5.63E+01		
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.62E+01	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)
Dose 2	Application Rate #2	7.73E+00		

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	6.65E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	3.17E+01		
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	5.36E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)
Dose 2	Application Rate #2	2.55E+01		

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	6.65E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	3.17E+01		
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	3.20E+01	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)
Dose 2	Application Rate #2	1.52E+01		

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
	Application Rate #1 (Units Converted)	5.52E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.63E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	2.39E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.14E-01		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	1.19E+01	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	5.69E+00		
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	2.39E-01	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)
Dose 2	Application Rate #2	1.14E-01		

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	$0.0687 \times BW\ Mc^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	$0.11 \times BW\ SM^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
	Application Rate #1 (Units Converted)	5.52E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	2.63E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	2.39E-01	mg	$0.5 \times SA\ SM\ (cm^2) \times R\ (mg/cm^2)$
Amt SM 2	Application Rate #2	1.14E-01		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	1.19E+01	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	5.69E+00		
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	2.39E-01	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)
Dose 2	Application Rate #2	1.14E-01		

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	5.904	mg/mL	See Section 2
C F 2	Application Rate #2	2.812		
	Application Rate #1 (Units Converted)	5,904	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	2,812		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.5588	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.2661		
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.51E-01	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	7.18E-02		

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	5.904	mg/mL	See Section 2
C F 2	Application Rate #2	2.812		
	Application Rate #1 (Units Converted)	5,904	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	2,812		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.5588	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.2661		
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	8.18E-02	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	3.90E-02		

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	7.39E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	3.52E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.37E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.13E-01		
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	7.42E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	3.53E-02		

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	7.39E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	3.52E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.37E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.13E-01		
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	4.43E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	2.11E-02		

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	1.18E+02	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.63E+01		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	3.79E+00	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	1.81E+00		
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	5.20E-01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	2.48E-01		

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.17E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.56E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	3.74E-03	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.78E-03		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.17E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	5.58E-04		

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.17E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.56E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	3.74E-03	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.78E-03		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	7.00E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	3.33E-04		

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	1.87E+00	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	8.90E-01		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	5.99E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	2.85E-02		
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	8.22E-03	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	3.92E-03		

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.11E-08	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	5.34E-10		

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	$0.099 \times BW\ SM^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	6.02E-09	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	2.90E-10		

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.00590	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.43E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.17E-11		
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.83E-10	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)
Dose 2	Application Rate #2	8.83E-12		

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.00590	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.43E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.17E-11		
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	2.05E-11	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)
Dose 2	Application Rate #2	9.89E-13		

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Acute Exposures (On-Site)						
Direct Spray						
Bee	F01a	7.83E+01	3.73E+01	1,075	7.28E-02	3.47E-02
Small Bird	F01b	1.28E+01	6.11E+00	631	2.03E-02	9.68E-03
Small Mammal	F01c	1.19E+01	5.69E+00	75	1.59E-01	7.59E-02
Ingestion of Contaminated Vegetation						
Small Avian Herbivore	F02a	2.31E+00	1.10E+00	631	3.67E-03	1.75E-03
Small Mammal Herbivore	F02b	1.38E+00	6.58E-01	75	1.84E-02	8.77E-03
Large Mammal Herbivore	F02c	1.62E+01	7.73E+00	75	2.16E-01	1.03E-01
Ingestion of Contaminated Insects						
Small Avian Insectivore	F03a	5.36E+01	2.55E+01	631	8.49E-02	4.04E-02
Small Mammal Insectivore	F03b	3.20E+01	1.52E+01	75	4.26E-01	2.03E-01
Ingestion of Contaminated Small Mammals						
Avian Carnivore	F04a	2.39E-01	1.14E-01	631	3.79E-04	1.80E-04
Mammalian Carnivore	F04b	2.39E-01	1.14E-01	75	3.19E-03	1.52E-03
Ingestion of Contaminated Surface Water						
Small Avian Herbivore	F05a	1.51E-01	7.18E-02	631	2.39E-04	1.14E-04
Small Mammal Herbivore	F05b	8.18E-02	3.90E-02	75	1.09E-03	5.19E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEL) for Insects	1,075	USEPA, 2005c
Toxicity (NOEL) for Birds	631	USEPA, 2005c
Toxicity (NOAEL) for Mammals	75	USDA, 2004c

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Chronic Exposures (On-Site and Off-Site)						
Ingestion of Contaminated Vegetation (On-Site)						
Small Avian Herbivore	F06a	7.42E-02	3.53E-02	6.31	1.18E-02	5.60E-03
Small Mammal Herbivore	F06b	4.43E-02	2.11E-02	15	2.95E-03	1.41E-03
Large Mammal Herbivore	F06c	5.20E-01	2.48E-01	15	3.47E-02	1.65E-02
Ingestion of Contaminated Vegetation (Off-Site)						
Small Avian Herbivore	F07a	1.17E-03	5.58E-04	6.31	1.86E-04	8.85E-05
Small Mammal Herbivore	F07b	7.00E-04	3.33E-04	15	4.67E-05	2.22E-05
Large Mammal Herbivore	F07c	8.22E-03	3.92E-03	15	5.48E-04	2.61E-04
Ingestion of Contaminated Surface Water (Off-Site)						
Small Avian Herbivore	F08a	1.11E-08	5.34E-10	6.31	1.76E-09	8.47E-11
Small Mammal Herbivore	F08b	6.02E-09	2.90E-10	15	4.01E-10	1.93E-11
Ingestion of Contaminated Fish (Off-Site)						
Avian Piscivore	F09a	1.83E-10	8.83E-12	6.31	2.90E-11	1.40E-12
Mammalian Piscivore	F09b	2.05E-11	9.89E-13	15	1.37E-12	6.60E-14

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEL) for Birds	6.31	Estimated from acute NOEC
Toxicity (NOAEL) for Mammals	15	USDA, 2004c

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Acute	5.59E-01	2.66E-01	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Acute Exposures	80	NOEC	USEPA, 2005c	6.98E-03	3.33E-03
Aquatic Invertebrates, Acute Exposures	100	NOEL	USEPA, 2005c	5.59E-03	2.66E-03
Aquatic Amphibians, Acute Exposures	151	NOEC	USDA, 2004c	3.70E-03	1.76E-03
Aquatic Plants					
Algae, Acute Exposures	24.2	NOEC	KTTK, 2005	2.31E-02	1.10E-02
Macrophytes, Acute Exposures	7.2	NOEC	Dow AgroSciences, 1998	7.76E-02	3.70E-02

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	4.11E-08	1.98E-09	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Chronic Exposures	43.8	NOEC	USDA, 2004c	9.38E-10	4.52E-11
Aquatic Invertebrates, Chronic Exposures	23.1	NOEC	USDA, 2004c	1.78E-09	8.58E-11
Aquatic Amphibians, Chronic Exposures	1.51	NOEC	Estimated from acute NOEC	2.72E-08	1.31E-09
Aquatic Plants					
Algae, Chronic Exposures	0.242	NOEC	Estimated from acute NOEC	1.70E-07	8.19E-09
Macrophytes, Chronic Exposures	0.072	NOEC	Estimated from acute NOEC	5.71E-07	2.75E-08

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.12E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.48E-04	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.59E+00	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.12E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	2.60E-03	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.60E-01	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.12E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.85E-03	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.42E-01	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.50E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	4.70E-02	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.50E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.80E-02	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	2.40E+00	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	3.29E-01	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.35E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.09E+00	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.35E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	6.49E-01	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.12E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.85E-03	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.42E-01	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	4.85E-03	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.12E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.85E-03	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.42E-01	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	4.85E-03	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	120	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0113	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.06E-03	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	120	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0113	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.66E-03	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.50E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.40E-03	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	7.53E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.50E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.40E-03	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	4.49E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.40E+00	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	3.85E-02	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	5.28E-03	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.37E-03	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	3.80E-05	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.19E-05	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.37E-03	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	3.80E-05	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	7.10E-06	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	3.79E-02	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	6.08E-04	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	8.34E-05	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	5.83E-15	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.16E-15	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	730	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.58E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.19E-11	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	730	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.58E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.33E-12	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute Exposures (On-Site)				
Direct Spray				
Bee	F01a	1.59E+00	1,075	1.48E-03
Small Bird	F01b	2.60E-01	300	8.68E-04
Small Mammal	F01c	2.42E-01	50	4.85E-03
Ingestion of Contaminated Vegetation				
Small Avian Herbivore	F02a	4.70E-02	300	1.57E-04
Small Mammal Herbivore	F02b	2.80E-02	50	5.61E-04
Large Mammal Herbivore	F02c	3.29E-01	50	6.59E-03
Ingestion of Contaminated Insects				
Small Avian Insectivore	F03a	1.09E+00	300	3.62E-03
Small Mammal Insectivore	F03b	6.49E-01	50	1.30E-02
Ingestion of Contaminated Small Mammals				
Avian Carnivore	F04a	4.85E-03	300	1.62E-05
Mammalian Carnivore	F04b	4.85E-03	50	9.70E-05
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	3.06E-03	300	1.02E-05
Small Mammal Herbivore	F05b	1.66E-03	50	3.32E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Insects	1,075	EXTOXNET, 1993 (see Table 3-2)
Toxicity (NOEC) for Birds	300	Minimum LD50 (3000 mg/kg) with a safety factor of 10
Toxicity (NOEC) for Mammals	50	Minimum LD50 (500 mg/kg) with a safety factor of 10

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Vegetation (On-Site)				
Small Avian Herbivore	F06a	7.53E-04	30	2.51E-05
Small Mammal Herbivore	F06b	4.49E-04	8.1	5.55E-05
Large Mammal Herbivore	F06c	5.28E-03	8.1	6.52E-04
Ingestion of Contaminated Vegetation (Off-Site)				
Small Avian Herbivore	F07a	1.19E-05	30	3.96E-07
Small Mammal Herbivore	F07b	7.10E-06	8.1	8.77E-07
Large Mammal Herbivore	F07c	8.34E-05	8.1	1.03E-05
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	5.83E-15	30	1.94E-16
Small Mammal Herbivore	F08b	3.16E-15	8.1	3.91E-16
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	1.19E-11	30	3.97E-13
Mammalian Piscivore	F09b	1.33E-12	8.1	1.65E-13

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEC) for Birds	30	Minimum LD50 (3000 mg/kg) with a safety factor of 100
Toxicity (NOEL) for Mammals	8.1	FR Vol 62 (80):20111-20117

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	1.13E-02	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	0.5	NOEL	USEPA, 2005c	2.27E-02
Aquatic Invertebrates, Acute Exposures	0.05	NOEL	USEPA, 2005c	2.27E-01
Aquatic Amphibians, Acute Exposures	--	--	--	--
Aquatic Plants				
Algae, Acute Exposures	--	--	--	--
Macrophytes, Acute Exposures	--	--	--	--

Notes:

-- No toxicity information identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	2.16E-14	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	0.048	NOEL	USEPA, 2005c	4.50E-13
Aquatic Invertebrates, Chronic Exposures	0.0000016	NOEL	USEPA, 2005c	1.35E-08
Aquatic Amphibians, Chronic Exposures	--	--	--	--
Aquatic Plants				
Algae, Chronic Exposures	--	--	--	--
Macrophytes, Chronic Exposures	--	--	--	--

Notes:

-- No toxicity information identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	0.11 x BW B $^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.74E-03	mg	0.5 × SA B (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.87E+01	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	3.06E-02	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	3.06E+00	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.70E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.85E+00	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.76E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	5.52E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.76E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.29E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	2.82E+01	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	3.87E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	0.398 x BW SAi $^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.59E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.28E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.59E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	7.62E+00	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.70E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.85E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.70E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.70E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.85E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.70E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	1,408	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.1332	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.59E-02	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	1,408	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.1332	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.95E-02	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.76E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	6.28E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.96E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.76E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	6.28E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.17E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.82E+01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.00E+01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.38E+00	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	$0.398 \times BW\ SAh^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.78E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	9.92E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.10E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.78E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	9.92E-03	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.85E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	4.46E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.59E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	2.18E-02	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.94E-09	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.05E-09	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	4,200	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	3.02E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	2.28E-05	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	4,200	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	3.02E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	2.55E-06	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute Exposures (On-Site)				
Direct Spray				
Bee	F01a	1.87E+01	268.8	6.94E-02
Small Bird	F01b	3.06E+00	200	1.53E-02
Small Mammal	F01c	2.85E+00	300	9.50E-03
Ingestion of Contaminated Vegetation				
Small Avian Herbivore	F02a	5.52E-01	200	2.76E-03
Small Mammal Herbivore	F02b	3.29E-01	300	1.10E-03
Large Mammal Herbivore	F02c	3.87E+00	300	1.29E-02
Ingestion of Contaminated Insects				
Small Avian Insectivore	F03a	1.28E+01	200	6.38E-02
Small Mammal Insectivore	F03b	7.62E+00	300	2.54E-02
Ingestion of Contaminated Small Mammals				
Avian Carnivore	F04a	5.70E-02	200	2.85E-04
Mammalian Carnivore	F04b	5.70E-02	300	1.90E-04
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	3.59E-02	200	1.80E-04
Small Mammal Herbivore	F05b	1.95E-02	300	6.50E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEL) for Insects	268.8	USEPA, 2005c
Toxicity (NOEL) for Birds	200	Estimated from LD50
Toxicity (NOEL) for Mammals	300	FR 68(10):2027-2032

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Vegetation (On-Site)				
Small Avian Herbivore	F06a	1.96E-01	20	9.82E-03
Small Mammal Herbivore	F06b	1.17E-01	80	1.47E-03
Large Mammal Herbivore	F06c	1.38E+00	80	1.72E-02
Ingestion of Contaminated Vegetation (Off-Site)				
Small Avian Herbivore	F07a	3.10E-03	20	1.55E-04
Small Mammal Herbivore	F07b	1.85E-03	80	2.32E-05
Large Mammal Herbivore	F07c	2.18E-02	80	2.72E-04
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	1.94E-09	20	9.69E-11
Small Mammal Herbivore	F08b	1.05E-09	80	1.32E-11
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	2.28E-05	20	1.14E-06
Mammalian Piscivore	F09b	2.55E-06	80	3.19E-08

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEL) for Birds	20	Estimated from acute NOEL
Toxicity (NOEL) for Mammals	80	FR 68(10):2027-2032

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	1.33E-01	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	0.63	NOEL	USEPA, 2005c	2.11E-01
Aquatic Invertebrates, Acute Exposures	0.135	NOEL	USEPA, 2005c	9.87E-01
Aquatic Amphibians, Acute Exposures	--	--	--	--
Aquatic Plants				
Algae, Acute Exposures	0.03	NOEL	USEPA, 2005c	4.44E+00
Macrophytes, Acute Exposures	0.437	NOEL	USEPA, 2005c	3.05E-01

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	7.19E-09	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	0.0063	NOEL	Estimated from acute NOEL	1.14E-06
Aquatic Invertebrates, Chronic Exposures	0.06	NOEL	USEPA, 2005c	1.20E-07
Aquatic Amphibians, Chronic Exposures	--	--	--	--
Aquatic Plants				
Algae, Chronic Exposures	0.03	NOEL	USEPA, 2005c	2.40E-07
Macrophytes, Chronic Exposures	0.437	NOEL	USEPA, 2005c	1.64E-08

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	9.623	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	9623	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.91	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	2.46E-01	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	9.623	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	9623	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.91	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.33E-01	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.21E-01	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	6.56E-02	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.44E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	4.10E-05	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.44E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	4.60E-06	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)
		Application Rate #1		Application Rate #1
Acute Exposures (On-Site)				
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	2.46E-01	562	4.37E-04
Small Mammal Herbivore	F05b	1.33E-01	175	7.62E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Birds	562	USDA, 2003a
Toxicity (NOAEL) for Mammals	175	USDA, 2003a

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	1.21E-01	100	1.21E-03
Small Mammal Herbivore	F08b	6.56E-02	30	2.19E-03
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	4.10E-05	100	4.10E-07
Mammalian Piscivore	F09b	4.60E-06	30	1.53E-07

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEC) for Birds	100	USDA, 2003a
Toxicity (NOAEL) for Mammals	30	USDA, 2003a

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	9.11E-01	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	2.2	NOEL	USEPA, 2005c	4.14E-01
Aquatic Invertebrates, Acute Exposures	1.9	NOEL	USEPA, 2005c	4.79E-01
Aquatic Amphibians, Acute Exposures	17.3	NOEL	Estimated from minimum LC50	5.26E-02
Aquatic Plants				
Algae, Acute Exposures	1.25	NOEL	Orme and Kegley, 2006	7.29E-01
Macrophytes, Acute Exposures	2.8	NOEL	USDA, 2003a	3.25E-01

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	4.48E-01	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	0.36	NOEL	USDA, 2003a	1.24E+00
Aquatic Invertebrates, Chronic Exposures	0.7	NOEL	USDA, 2003a	6.40E-01
Aquatic Amphibians, Chronic Exposures	3.43	NOEL	Estimated from minimum LC50	1.31E-01
Aquatic Plants				
Algae, Chronic Exposures	1.25	NOEL	Orme and Kegley, 2006	3.58E-01
Macrophytes, Chronic Exposures	2.8	NOEL	USDA, 2003a	1.60E-01

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
	Application Rate #1 (Units Converted)	3.39E-02		
	Application Rate #2 (Units Converted)	2.12E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.24E-03		
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	4.47E-02		
Amt B 2	Application Rate #2	2.80E-03	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Amt B 3	Application Rate #3	5.59E-03		
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	4.81E+02		
Dose 2	Application Rate #2	3.01E+01	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)
Dose 3	Application Rate #3	6.01E+01		

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
	Application Rate #1 (Units Converted)	3.39E-02		
	Application Rate #2 (Units Converted)	2.12E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.24E-03		
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	7.88E-01		
Amt SB 2	Application Rate #2	4.93E-02	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Amt SB 3	Application Rate #3	9.85E-02		
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	7.88E+01		
Dose 2	Application Rate #2	4.93E+00	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)
Dose 3	Application Rate #3	9.85E+00		

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
	Application Rate #1 (Units Converted)	3.39E-02		
	Application Rate #2 (Units Converted)	2.12E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.24E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.47E+00		
Amt SM 2	Application Rate #2	9.17E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 3	Application Rate #3	1.83E-01		
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	7.34E+01		
Dose 2	Application Rate #2	4.59E+00	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)
Dose 3	Application Rate #3	9.17E+00		

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	4.54E+01		
C FR2 2	Application Rate #2	2.84E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 3	Application Rate #3	5.68E+00		
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.42E+01		
Dose 2	Application Rate #2	8.89E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)
Dose 3	Application Rate #3	1.78E+00		

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	4.54E+01		
C FR2 2	Application Rate #2	2.84E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 3	Application Rate #3	5.68E+00		
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	8.49E+00		
Dose 2	Application Rate #2	5.30E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)
Dose 3	Application Rate #3	1.06E+00		

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	7.27E+02		
C SG 2	Application Rate #2	4.54E+01	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
C SG 3	Application Rate #3	9.08E+01		
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	9.97E+01		
Dose 2	Application Rate #2	6.23E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)
Dose 3	Application Rate #3	1.25E+01		

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	4.09E+02		
C I 2	Application Rate #2	2.55E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 3	Application Rate #3	5.11E+01		
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	3.29E+02		
Dose 2	Application Rate #2	2.06E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)
Dose 3	Application Rate #3	4.11E+01		

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	4.09E+02		
C I 2	Application Rate #2	2.55E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 3	Application Rate #3	5.11E+01		
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.96E+02		
Dose 2	Application Rate #2	1.23E+01	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)
Dose 3	Application Rate #3	2.46E+01		

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
	Application Rate #1 (Units Converted)	3.39E-02		
	Application Rate #2 (Units Converted)	2.12E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.24E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.47E+00		
Amt SM 2	Application Rate #2	9.17E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 3	Application Rate #3	1.83E-01		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	7.34E+01		
C SM 2	Application Rate #2	4.59E+00	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 3	Application Rate #3	9.17E+00		
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	1.47E+00		
Dose 2	Application Rate #2	9.17E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)
Dose 3	Application Rate #3	1.83E-01		

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
	Application Rate #1 (Units Converted)	3.39E-02		
	Application Rate #2 (Units Converted)	2.12E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.24E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.47E+00		
Amt SM 2	Application Rate #2	9.17E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 3	Application Rate #3	1.83E-01		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	7.34E+01		
C SM 2	Application Rate #2	4.59E+00	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 3	Application Rate #3	9.17E+00		
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	1.47E+00		
Dose 2	Application Rate #2	9.17E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)
Dose 3	Application Rate #3	1.83E-01		

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	120.9		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.11		
	Application Rate #1 (Units Converted)	120,894		
	Application Rate #2 (Units Converted)	7,556	mg/L	1000 mg/L per mg/mL
	Application Rate #3 (Units Converted)	15,112		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	11.4408		
C W 2	Application Rate #2	0.7151	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 3	Application Rate #3	1.4301		
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.09E+00		
Dose 2	Application Rate #2	1.93E-01	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 3	Application Rate #3	3.86E-01		

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	120.9		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.11		
	Application Rate #1 (Units Converted)	120,894		
	Application Rate #2 (Units Converted)	7,556	mg/L	1000 mg/L per mg/mL
	Application Rate #3 (Units Converted)	15,112		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	11.4408		
C W 2	Application Rate #2	0.7151	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 3	Application Rate #3	1.4301		
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.67E+00		
Dose 2	Application Rate #2	1.05E-01	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 3	Application Rate #3	2.09E-01		

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	4.54E+01		
C 0 2	Application Rate #2	2.84E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 3	Application Rate #3	5.68E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.27E+00		
TWA C FR2 2	Application Rate #2	4.54E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 3	Application Rate #3	9.08E-01		
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.27E+00		
Dose 2	Application Rate #2	1.42E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 3	Application Rate #3	2.84E-01		

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	4.54E+01		
C 0 2	Application Rate #2	2.84E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 3	Application Rate #3	5.68E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.27E+00		
TWA C FR2 2	Application Rate #2	4.54E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 3	Application Rate #3	9.08E-01		
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.36E+00		
Dose 2	Application Rate #2	8.49E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 3	Application Rate #3	1.70E-01		

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	7.27E+02		
C 0 2	Application Rate #2	4.54E+01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 3	Application Rate #3	9.08E+01		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.16E+02		
TWA C SG 2	Application Rate #2	7.27E+00	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 3	Application Rate #3	1.45E+01		
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.60E+01		
Dose 2	Application Rate #2	9.97E-01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 3	Application Rate #3	1.99E+00		

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	7.17E-01		
C 0 2	Application Rate #2	4.48E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 3	Application Rate #3	8.97E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.15E-01		
TWA C FR2 2	Application Rate #2	7.17E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 3	Application Rate #3	1.43E-02		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.59E-02		
Dose 2	Application Rate #2	2.25E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 3	Application Rate #3	4.49E-03		

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	7.17E-01		
C 0 2	Application Rate #2	4.48E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 3	Application Rate #3	8.97E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.15E-01		
TWA C FR2 2	Application Rate #2	7.17E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 3	Application Rate #3	1.43E-02		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.15E-02		
Dose 2	Application Rate #2	1.34E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 3	Application Rate #3	2.68E-03		

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	1.15E+01		
C 0 2	Application Rate #2	7.17E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 3	Application Rate #3	1.43E+00		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.84E+00		
TWA C SG 2	Application Rate #2	1.15E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 3	Application Rate #3	2.30E-01		
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	2.52E-01		
Dose 2	Application Rate #2	1.58E-02	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 3	Application Rate #3	3.15E-02		

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	9.47E-08		
Dose 2	Application Rate #2	3.41E-09	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 3	Application Rate #3	2.47E-09		

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	5.14E-08		
Dose 2	Application Rate #2	1.85E-09	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 3	Application Rate #3	1.34E-09		

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.26E-11		
C F 2	Application Rate #2	1.53E-12	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	1.11E-12		
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	3.22E-11		
Dose 2	Application Rate #2	1.16E-12	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)
Dose 3	Application Rate #3	8.39E-13		

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.26E-11		
C F 2	Application Rate #2	1.53E-12	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	1.11E-12		
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	3.60E-12		
Dose 2	Application Rate #2	1.30E-13	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)
Dose 3	Application Rate #3	9.40E-14		

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3		Application Rate #1	Application Rate #2	Application Rate #3
Acute Exposures (On-Site)								
Direct Spray								
Bee	F01a	4.81E+02	3.01E+01	6.01E+01	1,075	4.47E-01	2.80E-02	5.59E-02
Small Bird	F01b	7.88E+01	4.93E+00	9.85E+00	562	1.40E-01	8.77E-03	1.75E-02
Small Mammal	F01c	7.34E+01	4.59E+00	9.17E+00	175	4.19E-01	2.62E-02	5.24E-02
Ingestion of Contaminated Vegetation								
Small Avian Herbivore	F02a	1.42E+01	8.89E-01	1.78E+00	562	2.53E-02	1.58E-03	3.16E-03
Small Mammal Herbivore	F02b	8.49E+00	5.30E-01	1.06E+00	175	4.85E-02	3.03E-03	6.06E-03
Large Mammal Herbivore	F02c	9.97E+01	6.23E+00	1.25E+01	175	5.70E-01	3.56E-02	7.12E-02
Ingestion of Contaminated Insects								
Small Avian Insectivore	F03a	3.29E+02	2.06E+01	4.11E+01	562	5.85E-01	3.66E-02	7.32E-02
Small Mammal Insectivore	F03b	1.96E+02	1.23E+01	2.46E+01	175	1.12E+00	7.01E-02	1.40E-01
Ingestion of Contaminated Small Mammals								
Avian Carnivore	F04a	1.47E+00	9.17E-02	1.83E-01	562	2.61E-03	1.63E-04	3.26E-04
Mammalian Carnivore	F04b	1.47E+00	9.17E-02	1.83E-01	175	8.39E-03	5.24E-04	1.05E-03
Ingestion of Contaminated Surface Water								
Small Avian Herbivore	F05a	3.09E+00	1.93E-01	3.86E-01	562	5.49E-03	3.43E-04	6.86E-04
Small Mammal Herbivore	F05b	1.67E+00	1.05E-01	2.09E-01	175	9.57E-03	5.98E-04	1.20E-03

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEL) for Insects	1,075	USEPA, 2005c (see Table 3-2)
Toxicity (NOEC) for Birds	562	USDA, 2003a
Toxicity (NOAEL) for Mammals	175	USDA, 2003a

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3		Application Rate #1	Application Rate #2	Application Rate #3
Chronic Exposures (On-Site and Off-Site)								
Ingestion of Contaminated Vegetation (On-Site)								
Small Avian Herbivore	F06a	2.27E+00	1.42E-01	2.84E-01	100	2.27E-02	1.42E-03	2.84E-03
Small Mammal Herbivore	F06b	1.36E+00	8.49E-02	1.70E-01	30	4.53E-02	2.83E-03	5.66E-03
Large Mammal Herbivore	F06c	1.60E+01	9.97E-01	1.99E+00	30	5.32E-01	3.32E-02	6.65E-02
Ingestion of Contaminated Vegetation (Off-Site)								
Small Avian Herbivore	F07a	3.59E-02	2.25E-03	4.49E-03	100	3.59E-04	2.25E-05	4.49E-05
Small Mammal Herbivore	F07b	2.15E-02	1.34E-03	2.68E-03	30	7.15E-04	4.47E-05	8.94E-05
Large Mammal Herbivore	F07c	2.52E-01	1.58E-02	3.15E-02	30	8.40E-03	5.25E-04	1.05E-03
Ingestion of Contaminated Surface Water (Off-Site)								
Small Avian Herbivore	F08a	9.47E-08	3.41E-09	2.47E-09	100	9.47E-10	3.41E-11	2.47E-11
Small Mammal Herbivore	F08b	5.14E-08	1.85E-09	1.34E-09	30	1.71E-09	6.17E-11	4.47E-11
Ingestion of Contaminated Fish (Off-Site)								
Avian Piscivore	F09a	3.22E-11	1.16E-12	8.39E-13	100	3.22E-13	1.16E-14	8.39E-15
Mammalian Piscivore	F09b	3.60E-12	1.30E-13	9.40E-14	30	1.20E-13	4.32E-15	3.13E-15

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEC) for Birds	100	USDA, 2003a
Toxicity (NOAEL) for Mammals	30	USDA, 2003a

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Application Rate #2	Application Rate #3	Units	Reference / Calculation
Concentration in Water (mg/L)					
Concentration in (C) Water (W) Acute	1.14E+01	7.15E-01	1.43E+00	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)		
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2	Application Rate #3
Aquatic Animals						
Fish, Acute Exposures	2.2	NOEL	USEPA, 2005c	5.20E+00	3.25E-01	6.50E-01
Aquatic Invertebrates, Acute Exposures	1.9	NOEL	USEPA, 2005c	6.02E+00	3.76E-01	7.53E-01
Aquatic Amphibians, Acute Exposures	17.3	NOEL	Estimated from minimum LC50	6.61E-01	4.13E-02	8.27E-02
Aquatic Plants						
Algae, Acute Exposures	1.25	NOEL	Orme and Keglev, 2006	9.15E+00	5.72E-01	1.14E+00
Macrophytes, Acute Exposures	2.8	NOEL	USDA, 2003a	4.09E+00	2.55E-01	5.11E-01

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Application Rate #2	Application Rate #3	Units	Reference / Calculation
Concentration in Water (mg/L)					
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	3.51E-07	1.26E-08	9.16E-09	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)		
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2	Application Rate #3
Aquatic Animals						
Fish, Chronic Exposures	0.36	NOEL	USDA, 2003a	9.76E-07	3.51E-08	2.55E-08
Aquatic Invertebrates, Chronic Exposures	0.7	NOEL	USDA, 2003a	5.02E-07	1.81E-08	1.31E-08
Aquatic Amphibians, Chronic Exposures	3.43	NOEL	Estimated from minimum LC50	1.02E-07	3.69E-09	2.67E-09
Aquatic Plants						
Algae, Chronic Exposures	1.25	NOEL	Orme and Keglev, 2006	2.81E-07	1.01E-08	7.33E-09
Macrophytes, Chronic Exposures	2.8	NOEL	USDA, 2003a	1.25E-07	4.52E-09	3.27E-09

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
	Application Rate #1 (Units Converted)	3.38E-02		
	Application Rate #2 (Units Converted)	2.11E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.22E-03		
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	4.46E-02		
Amt B 2	Application Rate #2	2.78E-03	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Amt B 3	Application Rate #3	5.56E-03		
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	4.79E+02		
Dose 2	Application Rate #2	2.99E+01	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)
Dose 3	Application Rate #3	5.98E+01		

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
	Application Rate #1 (Units Converted)	3.38E-02		
	Application Rate #2 (Units Converted)	2.11E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.22E-03		
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	7.85E-01		
Amt SB 2	Application Rate #2	4.90E-02	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Amt SB 3	Application Rate #3	9.81E-02		
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	7.85E+01		
Dose 2	Application Rate #2	4.90E+00	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)
Dose 3	Application Rate #3	9.81E+00		

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	$0.11 \times BW\ SM^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
	Application Rate #1 (Units Converted)	3.38E-02		
	Application Rate #2 (Units Converted)	2.11E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.22E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.46E+00		
Amt SM 2	Application Rate #2	9.12E-02	mg	$0.5 \times SA\ SM\ (cm^2) \times R\ (mg/cm^2)$
Amt SM 3	Application Rate #3	1.83E-01		
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	7.31E+01		
Dose 2	Application Rate #2	4.56E+00	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)
Dose 3	Application Rate #3	9.13E+00		

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	4.52E+01		
C FR2 2	Application Rate #2	2.82E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 3	Application Rate #3	5.65E+00		
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.42E+01		
Dose 2	Application Rate #2	8.83E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)
Dose 3	Application Rate #3	1.77E+00		

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	4.52E+01		
C FR2 2	Application Rate #2	2.82E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 3	Application Rate #3	5.65E+00		
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	8.45E+00		
Dose 2	Application Rate #2	5.27E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)
Dose 3	Application Rate #3	1.06E+00		

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	7.24E+02		
C SG 2	Application Rate #2	4.52E+01	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
C SG 3	Application Rate #3	9.04E+01		
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	9.93E+01		
Dose 2	Application Rate #2	6.20E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)
Dose 3	Application Rate #3	1.24E+01		

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	4.07E+02		
C I 2	Application Rate #2	2.54E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 3	Application Rate #3	5.08E+01		
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	3.28E+02		
Dose 2	Application Rate #2	2.04E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)
Dose 3	Application Rate #3	4.09E+01		

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	4.07E+02		
C I 2	Application Rate #2	2.54E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 3	Application Rate #3	5.08E+01		
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.96E+02		
Dose 2	Application Rate #2	1.22E+01	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)
Dose 3	Application Rate #3	2.44E+01		

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
	Application Rate #1 (Units Converted)	3.38E-02		
	Application Rate #2 (Units Converted)	2.11E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.22E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.46E+00		
Amt SM 2	Application Rate #2	9.12E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 3	Application Rate #3	1.83E-01		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	7.31E+01		
C SM 2	Application Rate #2	4.56E+00	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 3	Application Rate #3	9.13E+00		
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	1.46E+00		
Dose 2	Application Rate #2	9.12E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)
Dose 3	Application Rate #3	1.83E-01		

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
	Application Rate #1 (Units Converted)	3.38E-02		
	Application Rate #2 (Units Converted)	2.11E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #3 (Units Converted)	4.22E-03		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.46E+00		
Amt SM 2	Application Rate #2	9.12E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 3	Application Rate #3	1.83E-01		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	7.31E+01		
C SM 2	Application Rate #2	4.56E+00	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 3	Application Rate #3	9.13E+00		
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	1.46E+00		
Dose 2	Application Rate #2	9.12E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)
Dose 3	Application Rate #3	1.83E-01		

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	120.4		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.04		
	Application Rate #1 (Units Converted)	120,429		
	Application Rate #2 (Units Converted)	7,513	mg/L	1000 mg/L per mg/mL
	Application Rate #3 (Units Converted)	15,039		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	11.3968		
C W 2	Application Rate #2	0.7110	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 3	Application Rate #3	1.4233		
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.07E+00		
Dose 2	Application Rate #2	1.92E-01	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 3	Application Rate #3	3.84E-01		

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	120.4		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.04		
	Application Rate #1 (Units Converted)	120,429		
	Application Rate #2 (Units Converted)	7,513	mg/L	1000 mg/L per mg/mL
	Application Rate #3 (Units Converted)	15,039		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	11.3968		
C W 2	Application Rate #2	0.7110	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 3	Application Rate #3	1.4233		
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.67E+00		
Dose 2	Application Rate #2	1.04E-01	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 3	Application Rate #3	2.08E-01		

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	4.52E+01		
C 0 2	Application Rate #2	2.82E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 3	Application Rate #3	5.65E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.24E+00		
TWA C FR2 2	Application Rate #2	4.51E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 3	Application Rate #3	9.04E-01		
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.27E+00		
Dose 2	Application Rate #2	1.41E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 3	Application Rate #3	2.83E-01		

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	4.52E+01		
C 0 2	Application Rate #2	2.82E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 3	Application Rate #3	5.65E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.24E+00		
TWA C FR2 2	Application Rate #2	4.51E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 3	Application Rate #3	9.04E-01		
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.35E+00		
Dose 2	Application Rate #2	8.44E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 3	Application Rate #3	1.69E-01		

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	7.24E+02		
C 0 2	Application Rate #2	4.52E+01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 3	Application Rate #3	9.04E+01		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.16E+02		
TWA C SG 2	Application Rate #2	7.22E+00	mg/kg	C_0 (mg/kg) × (1-$e^{-K (1/day) \times T (day)}$) / K (1/day) × T (day)
TWA C SG 3	Application Rate #3	1.45E+01		
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.59E+01		
Dose 2	Application Rate #2	9.91E-01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 3	Application Rate #3	1.98E+00		

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	$0.398 \times BW\ SAh^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.02	lb/acre	Texas, 2004
R 2	Application Rate #2	0.188		
R 3	Application Rate #3	0.377		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	7.15E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	4.46E-02		
C 0 3	Application Rate #3	8.93E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.14E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	7.13E-03		
TWA C FR2 3	Application Rate #3	1.43E-02		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.58E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	2.23E-03		
Dose 3	Application Rate #3	4.47E-03		

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.02	lb/acre	Texas, 2004
R 2	Application Rate #2	0.188		
R 3	Application Rate #3	0.377		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	7.15E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	4.46E-02		
C 0 3	Application Rate #3	8.93E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.14E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	7.13E-03		
TWA C FR2 3	Application Rate #3	1.43E-02		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.14E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	1.33E-03		
Dose 3	Application Rate #3	2.67E-03		

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	3.02		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	1.14E+01		
C 0 2	Application Rate #2	7.13E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 3	Application Rate #3	1.43E+00		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.83E+00		
TWA C SG 2	Application Rate #2	1.14E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 3	Application Rate #3	2.28E-01		
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	2.51E-01		
Dose 2	Application Rate #2	1.57E-02	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 3	Application Rate #3	3.14E-02		

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	9.47E-08		
Dose 2	Application Rate #2	3.41E-09	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 3	Application Rate #3	2.47E-09		

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	5.14E-08		
Dose 2	Application Rate #2	1.85E-09	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 3	Application Rate #3	1.34E-09		

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.00309	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.09E-09		
C F 2	Application Rate #2	3.91E-11	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	2.83E-11		
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	8.19E-10		
Dose 2	Application Rate #2	2.95E-11	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)
Dose 3	Application Rate #3	2.14E-11		

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.00309	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.09E-09		
C F 2	Application Rate #2	3.91E-11	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	2.83E-11		
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	9.18E-11		
Dose 2	Application Rate #2	3.30E-12	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)
Dose 3	Application Rate #3	2.39E-12		

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3		Application Rate #1	Application Rate #2	Application Rate #3
Acute Exposures (On-Site)								
Direct Spray								
Bee	F01a	4.79E+02	2.99E+01	5.98E+01	1,075	4.46E-01	2.78E-02	5.57E-02
Small Bird	F01b	7.85E+01	4.90E+00	9.81E+00	562	1.40E-01	8.72E-03	1.74E-02
Small Mammal	F01c	7.31E+01	4.56E+00	9.13E+00	175	4.18E-01	2.61E-02	5.22E-02
Ingestion of Contaminated Vegetation								
Small Avian Herbivore	F02a	1.42E+01	8.83E-01	1.77E+00	562	2.52E-02	1.57E-03	3.15E-03
Small Mammal Herbivore	F02b	8.45E+00	5.27E-01	1.06E+00	175	4.83E-02	3.01E-03	6.03E-03
Large Mammal Herbivore	F02c	9.93E+01	6.20E+00	1.24E+01	175	5.68E-01	3.54E-02	7.09E-02
Ingestion of Contaminated Insects								
Small Avian Insectivore	F03a	3.28E+02	2.04E+01	4.09E+01	562	5.83E-01	3.64E-02	7.28E-02
Small Mammal Insectivore	F03b	1.96E+02	1.22E+01	2.44E+01	175	1.12E+00	6.97E-02	1.40E-01
Ingestion of Contaminated Small Mammals								
Avian Carnivore	F04a	1.46E+00	9.12E-02	1.83E-01	562	2.60E-03	1.62E-04	3.25E-04
Mammalian Carnivore	F04b	1.46E+00	9.12E-02	1.83E-01	175	8.36E-03	5.21E-04	1.04E-03
Ingestion of Contaminated Surface Water								
Small Avian Herbivore	F05a	3.07E+00	1.92E-01	3.84E-01	562	5.47E-03	3.41E-04	6.83E-04
Small Mammal Herbivore	F05b	1.67E+00	1.04E-01	2.08E-01	175	9.53E-03	5.95E-04	1.19E-03

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEL) for Insects	1,075	USEPA, 2005c (see Table 3-2)
Toxicity (NOEC) for Birds	562	USDA, 2003a
Toxicity (NOAEL) for Mammals	175	USDA, 2003a

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3		Application Rate #1	Application Rate #2	Application Rate #3
Chronic Exposures (On-Site and Off-Site)								
Ingestion of Contaminated Vegetation (On-Site)								
Small Avian Herbivore	F06a	2.27E+00	1.41E-01	2.83E-01	100	2.27E-02	1.41E-03	2.83E-03
Small Mammal Herbivore	F06b	1.35E+00	8.44E-02	1.69E-01	30	4.51E-02	2.81E-03	5.63E-03
Large Mammal Herbivore	F06c	1.59E+01	9.91E-01	1.98E+00	30	5.30E-01	3.30E-02	6.61E-02
Ingestion of Contaminated Vegetation (Off-Site)								
Small Avian Herbivore	F07a	3.58E-02	2.23E-03	4.47E-03	100	3.58E-04	2.23E-05	4.47E-05
Small Mammal Herbivore	F07b	2.14E-02	1.33E-03	2.67E-03	30	7.12E-04	4.44E-05	8.90E-05
Large Mammal Herbivore	F07c	2.51E-01	1.57E-02	3.14E-02	30	8.37E-03	5.22E-04	1.05E-03
Ingestion of Contaminated Surface Water (Off-Site)								
Small Avian Herbivore	F08a	9.47E-08	3.41E-09	2.47E-09	100	9.47E-10	3.41E-11	2.47E-11
Small Mammal Herbivore	F08b	5.14E-08	1.85E-09	1.34E-09	30	1.71E-09	6.17E-11	4.47E-11
Ingestion of Contaminated Fish (Off-Site)								
Avian Piscivore	F09a	8.19E-10	2.95E-11	2.14E-11	100	8.19E-12	2.95E-13	2.14E-13
Mammalian Piscivore	F09b	9.18E-11	3.30E-12	2.39E-12	30	3.06E-12	1.10E-13	7.98E-14

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (--) for Insects	--	--
Toxicity (NOEC) for Birds	100	USDA, 2003a
Toxicity (NOAEL) for Mammals	30	USDA, 2003a

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Application Rate #2	Application Rate #3	Units	Reference / Calculation
Concentration in Water (mg/L)					
Concentration in (C) Water (W) Acute	1.14E+01	7.11E-01	1.42E+00	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)		
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2	Application Rate #3
Aquatic Animals						
Fish, Acute Exposures	2.2	NOEL	USEPA, 2005c	5.18E+00	3.23E-01	6.47E-01
Aquatic Invertebrates, Acute Exposures	1.9	NOEL	USEPA, 2005c	6.00E+00	3.74E-01	7.49E-01
Aquatic Amphibians, Acute Exposures	4.06	NOEL	Estimated from minimum LC50	2.81E+00	1.75E-01	3.51E-01
Aquatic Plants						
Algae, Acute Exposures	1.25	NOEC	Orme and Kegley, 2006	9.12E+00	5.69E-01	1.14E+00
Macrophytes, Acute Exposures	2.8	NOEL	USDA, 2003a	4.07E+00	2.54E-01	5.08E-01

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Application Rate #2	Application Rate #3	Units	Reference / Calculation
Concentration in Water (mg/L)					
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	3.51E-07	1.26E-08	9.16E-09	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)		
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2	Application Rate #3
Aquatic Animals						
Fish, Chronic Exposures	0.022	NOEL	Estimated from acute NOEL	1.60E-05	5.75E-07	4.16E-07
Aquatic Invertebrates, Chronic Exposures	0.019	NOEL	Estimated from acute NOEL	1.85E-05	6.65E-07	4.82E-07
Aquatic Amphibians, Chronic Exposures	0.812	NOEL	Estimated from minimum LC50	4.32E-07	1.56E-08	1.13E-08
Aquatic Plants						
Algae, Chronic Exposures	1.25	NOEC	Orme and Kegley, 2006	2.81E-07	1.01E-08	7.33E-09
Macrophytes, Chronic Exposures	2.8	NOEL	USDA, 2003a	1.25E-07	4.52E-09	3.27E-09

Notes:

-- No toxicity information was identified from the literature

Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.11E-02	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.46E-02	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.57E+02	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.11E-02	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	2.58E-01	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.58E+01	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.11E-02	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.80E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.40E+01	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.49E+01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	4.65E+00	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.49E+01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.78E+00	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	2.38E+02	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	3.26E+01	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	0.398 x BW SAi $^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.34E+02	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.08E+02	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.34E+02	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	6.43E+01	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.11E-02	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.80E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.40E+01	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	4.80E-01	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.11E-02	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.80E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.40E+01	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	4.80E-01	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	23,729	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	2.25	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	6.06E-01	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	23,729	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	2.25	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.29E-01	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.49E+01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	5.63E+00	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.76E+00	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.49E+01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	5.63E+00	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.05E+00	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.38E+02	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	9.01E+01	mg/kg	C_0 (mg/kg) × (1-e$^{-K (1/day) \times T (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.24E+01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.35E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	8.89E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.78E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.35E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	8.89E-02	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.66E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	3.76E+00	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.42E+00	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.95E-01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	7.86E-08	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	4.26E-08	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.701	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.04E-07	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.54E-07	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.701	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.04E-07	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.73E-08	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute Exposures (On-Site)				
Direct Spray				
Bee	F01a	1.57E+02	1,075	1.46E-01
Small Bird	F01b	2.58E+01	674	3.83E-02
Small Mammal	F01c	2.40E+01	1,695	1.42E-02
Ingestion of Contaminated Vegetation				
Small Avian Herbivore	F02a	4.65E+00	674	6.90E-03
Small Mammal Herbivore	F02b	2.78E+00	1,695	1.64E-03
Large Mammal Herbivore	F02c	3.26E+01	1,695	1.92E-02
Ingestion of Contaminated Insects				
Small Avian Insectivore	F03a	1.08E+02	674	1.60E-01
Small Mammal Insectivore	F03b	6.43E+01	1,695	3.79E-02
Ingestion of Contaminated Small Mammals				
Avian Carnivore	F04a	4.80E-01	674	7.12E-04
Mammalian Carnivore	F04b	4.80E-01	1,695	2.83E-04
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	6.06E-01	674	8.99E-04
Small Mammal Herbivore	F05b	3.29E-01	1,695	1.94E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Insects	1,075	USEPA, 2005c (see Table 3-2)
Toxicity (NOEC) for Birds	674	USDA, 2004e
Toxicity (NOAEL) for Mammals	1,695	USDA, 2004e

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Vegetation (On-Site)				
Small Avian Herbivore	F06a	1.76E+00	200	8.81E-03
Small Mammal Herbivore	F06b	1.05E+00	262.9	4.00E-03
Large Mammal Herbivore	F06c	1.24E+01	262.9	4.70E-02
Ingestion of Contaminated Vegetation (Off-Site)				
Small Avian Herbivore	F07a	2.78E-02	200	1.39E-04
Small Mammal Herbivore	F07b	1.66E-02	262.9	6.32E-05
Large Mammal Herbivore	F07c	1.95E-01	262.9	7.43E-04
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	7.86E-08	200	3.93E-10
Small Mammal Herbivore	F08b	4.26E-08	262.9	1.62E-10
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	1.54E-07	200	7.71E-10
Mammalian Piscivore	F09b	1.73E-08	262.9	6.57E-11

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEC) for Birds	200	USDA, 2004e
Toxicity (NOAEL) for Mammals	262.9	USDA, 2004e

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	2.25E+00	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	100	NOEL	USEPA, 2005c	2.25E-02
Aquatic Invertebrates, Acute Exposures	100	NOEC	USDA, 2004e	2.25E-02
Aquatic Amphibians, Acute Exposures	--	--	--	--
Aquatic Plants				
Algae, Acute Exposures	9.6	NOEL	USEPA, 2005c	2.34E-01
Macrophytes, Acute Exposures	0.01	NOEL	USEPA, 2005c	2.25E+02

Notes:

-- No toxicity information identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	2.91E-07	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	43.1	NOEL	USEPA, 2005c	6.76E-09
Aquatic Invertebrates, Chronic Exposures	97.1	NOEL	USEPA, 2005c	3.00E-09
Aquatic Amphibians, Chronic Exposures	--	--	--	--
Aquatic Plants				
Algae, Chronic Exposures	9.6	NOEL	USEPA, 2005c	3.03E-08
Macrophytes, Chronic Exposures	0.01	NOEL	USEPA, 2005c	2.91E-05

Notes:

-- No toxicity information identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	5.45E-03	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	2.96E-03	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(BW\ Ap)(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	8,913	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	180	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.36E+02	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	8,913	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	180	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.52E+01	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	5.45E-03	5	1.09E-03
Small Mammal Herbivore	F08b	2.96E-03	30	9.86E-05
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	1.36E+02	5	2.72E+01
Mammalian Piscivore	F09b	1.52E+01	30	5.08E-01

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEL) for Birds	5	Estimated from Acute NOEL
Toxicity (NOAEL) for Mammals	30	EXTOXNET, 1996

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	2.02E-02	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	0.048	NOEC	Orme and Kegley, 2006	4.21E-01
Aquatic Invertebrates, Chronic Exposures	0.027	NOEL	USEPA, 2005	7.48E-01
Aquatic Amphibians, Chronic Exposures	0.4	NOEC	Orme and Kegley, 2006	5.05E-02
Aquatic Plants				
Algae, Chronic Exposures	--	--	--	--
Macrophytes, Chronic Exposures	--	--	--	--

Notes:

-- No toxicity information identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	4.39E-04		
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.73E-03	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Amt B 2	Application Rate #2	5.78E-04		
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.86E+01	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)
Dose 2	Application Rate #2	6.22E+00		

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	4.39E-04		
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	3.06E-02	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Amt SB 2	Application Rate #2	1.02E-02		
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	3.06E+00	mg/kg/day	Amt SB (mg) /
Dose 2	Application Rate #2	1.02E+00		BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	4.39E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.69E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.90E-02		
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.85E+00	mg/kg/day	Amt SM (mg) /
Dose 2	Application Rate #2	9.49E-01		BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.76E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	5.87E-01		
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	5.51E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)
Dose 2	Application Rate #2	1.84E-01		

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.76E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	5.87E-01		
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.29E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)
Dose 2	Application Rate #2	1.10E-01		

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	2.82E+01	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
C SG 2	Application Rate #2	9.39E+00		
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	3.87E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)
Dose 2	Application Rate #2	1.29E+00		

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.58E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	5.28E+00		
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.28E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)
Dose 2	Application Rate #2	4.25E+00		

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.58E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	5.28E+00		
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	7.62E+00	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)
Dose 2	Application Rate #2	2.54E+00		

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	4.39E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.69E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.90E-02		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.85E+00	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	9.49E-01		
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.69E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)
Dose 2	Application Rate #2	1.90E-02		

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
	Application Rate #1 (Units Converted)	1.32E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	4.39E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	5.69E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	1.90E-02		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.85E+00	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	9.49E-01		
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	5.69E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)
Dose 2	Application Rate #2	1.90E-02		

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
	Application Rate #1 (Units Converted)	1,406	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	469		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.1331	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.0444		
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.59E-02	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	1.20E-02		

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
	Application Rate #1 (Units Converted)	1,406	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	469		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.1331	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.0444		
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.95E-02	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	6.49E-03		

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.76E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.87E-01		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.41E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	2.47E-01		
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.32E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	7.73E-02		

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.76E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	5.87E-01		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.41E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	2.47E-01		
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.38E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	4.62E-02		

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.82E+01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	9.39E+00		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.19E+01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	3.95E+00		
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.63E+00	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	5.42E-01		

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	$0.398 \times BW\ SAh^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.78E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	9.27E-03		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.17E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	3.90E-03		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.66E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	1.22E-03		

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.78E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	9.27E-03		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.17E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	3.90E-03		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.19E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	7.29E-04		

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.039		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	4.45E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	1.48E-01		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.87E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	6.24E-02		
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	2.57E-02	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	8.57E-03		

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.53E-08	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	5.04E-09		

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	8.32E-09	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	2.73E-09		

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(BW\ Ap)(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.0301	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.71E-09	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	5.61E-10		
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.29E-09	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)
Dose 2	Application Rate #2	4.24E-10		

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.0301	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.71E-09	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	5.61E-10		
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.45E-10	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)
Dose 2	Application Rate #2	4.75E-11		

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Acute Exposures (On-Site)						
Direct Spray						
Bee	F01a	1.86E+01	6.22E+00	268.8	6.94E-02	2.31E-02
Small Bird	F01b	3.06E+00	1.02E+00	1,043	2.93E-03	9.77E-04
Small Mammal	F01c	2.85E+00	9.49E-01	521	5.46E-03	1.82E-03
Ingestion of Contaminated Vegetation						
Small Avian Herbivore	F02a	5.51E-01	1.84E-01	1,043	5.28E-04	1.76E-04
Small Mammal Herbivore	F02b	3.29E-01	1.10E-01	521	6.32E-04	2.11E-04
Large Mammal Herbivore	F02c	3.87E+00	1.29E+00	521	7.42E-03	2.47E-03
Ingestion of Contaminated Insects						
Small Avian Insectivore	F03a	1.28E+01	4.25E+00	1,043	1.22E-02	4.08E-03
Small Mammal Insectivore	F03b	7.62E+00	2.54E+00	521	1.46E-02	4.87E-03
Ingestion of Contaminated Small Mammals						
Avian Carnivore	F04a	5.69E-02	1.90E-02	1,043	5.46E-05	1.82E-05
Mammalian Carnivore	F04b	5.69E-02	1.90E-02	521	1.09E-04	3.64E-05
Ingestion of Contaminated Surface Water						
Small Avian Herbivore	F05a	3.59E-02	1.20E-02	1,043	3.44E-05	1.15E-05
Small Mammal Herbivore	F05b	1.95E-02	6.49E-03	521	3.74E-05	1.25E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEL) for Insects	268.8	USEPA, 2005c
Toxicity (NOEL) for Birds	1,043	USDA, 2004b
Toxicity (NOEL) for Mammals	521	USDA, 2004b

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Chronic Exposures (On-Site and Off-Site)						
Ingestion of Contaminated Vegetation (On-Site)						
Small Avian Herbivore	F06a	2.32E-01	7.73E-02	120	1.93E-03	6.44E-04
Small Mammal Herbivore	F06b	1.38E-01	4.62E-02	25	5.54E-03	1.85E-03
Large Mammal Herbivore	F06c	1.63E+00	5.42E-01	25	6.51E-02	2.17E-02
Ingestion of Contaminated Vegetation (Off-Site)						
Small Avian Herbivore	F07a	3.66E-03	1.22E-03	120	3.05E-05	1.02E-05
Small Mammal Herbivore	F07b	2.19E-03	7.29E-04	25	8.75E-05	2.92E-05
Large Mammal Herbivore	F07c	2.57E-02	8.57E-03	25	1.03E-03	3.43E-04
Ingestion of Contaminated Surface Water (Off-Site)						
Small Avian Herbivore	F08a	1.53E-08	5.04E-09	120	1.28E-10	4.20E-11
Small Mammal Herbivore	F08b	8.32E-09	2.73E-09	25	3.33E-10	1.09E-10
Ingestion of Contaminated Fish (Off-Site)						
Avian Piscivore	F09a	1.29E-09	4.24E-10	120	1.07E-11	3.53E-12
Mammalian Piscivore	F09b	1.45E-10	4.75E-11	25	5.78E-12	1.90E-12

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOEL) for Birds	120	USDA, 2004b
Toxicity (NOEL) for Mammals	25	USDA, 2004b

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Acute	1.33E-01	4.44E-02	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Acute Exposures	10	NOAEL	USDA, 2004b	1.33E-02	4.44E-03
Aquatic Invertebrates, Acute Exposures	150	NOEC	USDA, 2004b	8.87E-04	2.96E-04
Aquatic Amphibians, Acute Exposures	--	--	--	--	--
Aquatic Plants					
Algae, Acute Exposures	0.01	NOEL	USEPA, 2005c	1.33E+01	4.44E+00
Macrophytes, Acute Exposures	0.00016	NOEL	USEPA, 2005c	8.32E+02	2.77E+02

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	5.68E-08	1.87E-08	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Chronic Exposures	4.5	NOEC	USEPA, 2005c	1.26E-08	4.15E-09
Aquatic Invertebrates, Chronic Exposures	17	NOEC	USDA, 2004b	3.34E-09	1.10E-09
Aquatic Amphibians, Chronic Exposures	--	--	--	--	--
Aquatic Plants					
Algae, Chronic Exposures	0.01	NOEL	USEPA, 2005c	5.68E-06	1.87E-06
Macrophytes, Chronic Exposures	0.00016	NOEL	USEPA, 2005c	3.55E-04	1.17E-04

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
	Application Rate #1 (Units Converted)	4.11E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	8.22E-04		
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	5.42E-04	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Amt B 2	Application Rate #2	1.08E-03		
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	5.83E+00	mg/kg/day	Amt B (mg) /
Dose 2	Application Rate #2	1.17E+01		BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
	Application Rate #1 (Units Converted)	4.11E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	8.22E-04		
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	9.55E-03	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Amt SB 2	Application Rate #2	1.91E-02		
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	9.55E-01	mg/kg/day	Amt SB (mg) /
Dose 2	Application Rate #2	1.91E+00		BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
	Application Rate #1 (Units Converted)	4.11E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	8.22E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.78E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	3.56E-02		
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	8.89E-01	mg/kg/day	Amt SM (mg) /
Dose 2	Application Rate #2	1.78E+00		BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	5.50E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	1.10E+00		
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.72E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)
Dose 2	Application Rate #2	3.45E-01		

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	5.50E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
C FR2 2	Application Rate #2	1.10E+00		
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.03E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)
Dose 2	Application Rate #2	2.06E-01		

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	8.80E+00	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
C SG 2	Application Rate #2	1.76E+01		
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.21E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)
Dose 2	Application Rate #2	2.42E+00		

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	4.95E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	9.90E+00		
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	3.99E+00	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)
Dose 2	Application Rate #2	7.97E+00		

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	4.95E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
C I 2	Application Rate #2	9.90E+00		
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	2.38E+00	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)
Dose 2	Application Rate #2	4.76E+00		

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
	Application Rate #1 (Units Converted)	4.11E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	8.22E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.78E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Amt SM 2	Application Rate #2	3.56E-02		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	8.89E-01	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	1.78E+00		
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	1.78E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)
Dose 2	Application Rate #2	3.56E-02		

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	$0.0687 \times BW\ Mc^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	$0.11 \times BW\ SM^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
	Application Rate #1 (Units Converted)	4.11E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
	Application Rate #2 (Units Converted)	8.22E-04		
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	1.78E-02	mg	$0.5 \times SA\ SM\ (cm^2) \times R\ (mg/cm^2)$
Amt SM 2	Application Rate #2	3.56E-02		
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	8.89E-01	mg/kg	Amt SM (mg) / BW SM (kg)
C SM 2	Application Rate #2	1.78E+00		
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	1.78E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)
Dose 2	Application Rate #2	3.56E-02		

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.439	mg/mL	See Section 2
C F 2	Application Rate #2	0.879		
	Application Rate #1 (Units Converted)	439	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	879		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0416	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.0832		
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.12E-02	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	2.24E-02		

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.439	mg/mL	See Section 2
C F 2	Application Rate #2	0.879		
	Application Rate #1 (Units Converted)	439	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	879		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0416	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	0.0832		
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	6.09E-03	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	1.22E-02		

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	5.50E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	1.10E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	8.80E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.76E-01		
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.76E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	5.51E-02		

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	5.50E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	1.10E+00		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	8.80E-02	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	1.76E-01		
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.65E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	3.29E-02		

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	8.80E+00	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	1.76E+01		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.41E+00	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	2.82E+00		
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.93E-01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	3.87E-01		

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	$0.398 \times BW\ SAh^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	8.69E-03	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	1.74E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.39E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	2.78E-03		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	4.35E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)
Dose 2	Application Rate #2	8.71E-04		

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	8.69E-03	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
C 0 2	Application Rate #2	1.74E-02		
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	1.39E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C FR2 2	Application Rate #2	2.78E-03		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.60E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)
Dose 2	Application Rate #2	5.20E-04		

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	1.39E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
C 0 2	Application Rate #2	2.78E-01		
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	2.23E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
TWA C SG 2	Application Rate #2	4.45E-02		
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	3.05E-03	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)
Dose 2	Application Rate #2	6.11E-03		

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.76E-10	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	3.52E-10		

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	$0.099 \times BW\ SM^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	9.56E-11	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	1.91E-10		

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(BW\ Ap)(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	3.44E-10		
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.30E-10	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)
Dose 2	Application Rate #2	2.59E-10		

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	3.44E-10		
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	1.45E-11	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)
Dose 2	Application Rate #2	2.91E-11		

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Acute Exposures (On-Site)						
Direct Spray						
Bee	F01a	5.83E+00	1.17E+01	1,075	5.42E-03	1.08E-02
Small Bird	F01b	9.55E-01	1.91E+00	332.5	2.87E-03	5.74E-03
Small Mammal	F01c	8.89E-01	1.78E+00	86.6	1.03E-02	2.05E-02
Ingestion of Contaminated Vegetation						
Small Avian Herbivore	F02a	1.72E-01	3.45E-01	332.5	5.18E-04	1.04E-03
Small Mammal Herbivore	F02b	1.03E-01	2.06E-01	86.6	1.19E-03	2.37E-03
Large Mammal Herbivore	F02c	1.21E+00	2.42E+00	86.6	1.39E-02	2.79E-02
Ingestion of Contaminated Insects						
Small Avian Insectivore	F03a	3.99E+00	7.97E+00	332.5	1.20E-02	2.40E-02
Small Mammal Insectivore	F03b	2.38E+00	4.76E+00	86.6	2.75E-02	5.50E-02
Ingestion of Contaminated Small Mammals						
Avian Carnivore	F04a	1.78E-02	3.56E-02	332.5	5.35E-05	1.07E-04
Mammalian Carnivore	F04b	1.78E-02	3.56E-02	86.6	2.05E-04	4.11E-04
Ingestion of Contaminated Surface Water						
Small Avian Herbivore	F05a	1.12E-02	2.24E-02	332.5	3.37E-05	6.75E-05
Small Mammal Herbivore	F05b	6.09E-03	1.22E-02	86.6	7.03E-05	1.41E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Insects	1,075	USDA, 2004a
Toxicity (NOAEL) for Birds	332.5	USDA, 2004a
Toxicity (NOAEL) for Mammals	86.6	USDA, 2004a

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Chronic Exposures (On-Site and Off-Site)						
Ingestion of Contaminated Vegetation (On-Site)						
Small Avian Herbivore	F06a	2.76E-02	5.51E-02	3.325	8.29E-03	1.66E-02
Small Mammal Herbivore	F06b	1.65E-02	3.29E-02	2	8.23E-03	1.65E-02
Large Mammal Herbivore	F06c	1.93E-01	3.87E-01	2	9.66E-02	1.93E-01
Ingestion of Contaminated Vegetation (Off-Site)						
Small Avian Herbivore	F07a	4.35E-04	8.71E-04	3.325	1.31E-04	2.62E-04
Small Mammal Herbivore	F07b	2.60E-04	5.20E-04	2	1.30E-04	2.60E-04
Large Mammal Herbivore	F07c	3.05E-03	6.11E-03	2	1.53E-03	3.05E-03
Ingestion of Contaminated Surface Water (Off-Site)						
Small Avian Herbivore	F08a	1.76E-10	3.52E-10	3.325	5.29E-11	1.06E-10
Small Mammal Herbivore	F08b	9.56E-11	1.91E-10	2	4.78E-11	9.56E-11
Ingestion of Contaminated Fish (Off-Site)						
Avian Piscivore	F09a	1.30E-10	2.59E-10	3.325	3.90E-11	7.80E-11
Mammalian Piscivore	F09b	1.45E-11	2.91E-11	2	7.27E-12	1.45E-11

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (--) for Birds	3.325	--
Toxicity (NOAEL) for Mammals	2	USDA, 2004a

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Acute	4.16E-02	8.32E-02	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Acute Exposures	7.3	NOEC	USDA, 2004a	5.70E-03	1.14E-02
Aquatic Invertebrates, Acute Exposures	12.5	NOEC	USDA, 2004a	3.33E-03	6.65E-03
Aquatic Amphibians, Acute Exposures	0.38	NOEC	USDA, 2004a	1.09E-01	2.19E-01
Aquatic Plants					
Algae, Acute Exposures	0.0025	NOEC	USDA, 2004a	1.66E+01	3.33E+01
Macrophytes, Acute Exposures	0.000207	NOEC	USEPA, 2005	2.01E+02	4.02E+02

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	6.53E-10	1.31E-09	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Chronic Exposures	1.17	NOEC	USDA, 2004a	5.58E-10	1.12E-09
Aquatic Invertebrates, Chronic Exposures	6.1	NOEC	USEPA, 2005	1.07E-10	2.14E-10
Aquatic Amphibians, Chronic Exposures	0.00075	NOEC	USDA, 2004a	8.70E-07	1.74E-06
Aquatic Plants					
Algae, Chronic Exposures	0.0025	NOEC	USDA, 2004a	2.61E-07	5.22E-07
Macrophytes, Chronic Exposures	0.000207	NOEC	USEPA, 2005	3.15E-06	6.31E-06

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.10E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.45E-03	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.55E+01	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.10E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	2.55E-02	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.55E+00	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.10E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.74E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	2.37E+00	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.47E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	4.59E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.47E+00	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.74E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	2.35E+01	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	3.22E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	0.398 x BW SAi $^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.32E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	1.06E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.32E+01	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	6.35E+00	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.10E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.74E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.37E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	4.74E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	0.0687 x BW Mc $^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.10E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	4.74E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	2.37E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	4.74E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	781	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0739	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.99E-02	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	781	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0739	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.08E-02	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.47E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.35E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	7.35E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.47E+00	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.35E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	4.39E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.35E+01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	3.76E+00	mg/kg	C_0 (mg/kg) × (1-e$^{-K (1/day) \times T (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	5.15E-01	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	$0.398 \times BW\ SAh^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.32E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	3.71E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.16E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	2.32E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	3.71E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	6.93E-04	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	3.71E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	5.93E-02	mg/kg	C_0 (mg/kg) × (1-e$^{-K (1/day) \times T (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	8.14E-03	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	4.83E-10	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	2.62E-10	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(BW\ Ap)(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	3.56E-10	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	3.99E-11	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute Exposures (On-Site)				
Direct Spray				
Bee	F01a	1.55E+01	1,075	1.45E-02
Small Bird	F01b	2.55E+00	332.52	7.66E-03
Small Mammal	F01c	2.37E+00	86.6	2.74E-02
Ingestion of Contaminated Vegetation				
Small Avian Herbivore	F02a	4.59E-01	332.52	1.38E-03
Small Mammal Herbivore	F02b	2.74E-01	86.6	3.17E-03
Large Mammal Herbivore	F02c	3.22E+00	86.6	3.72E-02
Ingestion of Contaminated Insects				
Small Avian Insectivore	F03a	1.06E+01	332.52	3.20E-02
Small Mammal Insectivore	F03b	6.35E+00	86.6	7.33E-02
Ingestion of Contaminated Small Mammals				
Avian Carnivore	F04a	4.74E-02	332.52	1.43E-04
Mammalian Carnivore	F04b	4.74E-02	86.6	5.48E-04
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	1.99E-02	332.52	6.00E-05
Small Mammal Herbivore	F05b	1.08E-02	86.6	1.25E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Insects	1,075	USDA, 2004a
Toxicity (NOAEL) for Birds	332.52	USDA, 2004a
Toxicity (NOAEL) for Mammals	86.6	USDA, 2004a

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Vegetation (On-Site)				
Small Avian Herbivore	F06a	7.35E-02	3.325	2.21E-02
Small Mammal Herbivore	F06b	4.39E-02	2	2.19E-02
Large Mammal Herbivore	F06c	5.15E-01	2	2.58E-01
Ingestion of Contaminated Vegetation (Off-Site)				
Small Avian Herbivore	F07a	1.16E-03	3.325	3.49E-04
Small Mammal Herbivore	F07b	6.93E-04	2	3.47E-04
Large Mammal Herbivore	F07c	8.14E-03	2	4.07E-03
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	4.83E-10	3.325	1.45E-10
Small Mammal Herbivore	F08b	2.62E-10	2	1.31E-10
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	3.56E-10	3.325	1.07E-10
Mammalian Piscivore	F09b	3.99E-11	2	1.99E-11

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOAEL) for Birds	3.325	Estimated from acute NOAEL
Toxicity (NOAEL) for Mammals	2	USDA, 2004a

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	7.39E-02	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	7.3	NOEC	USDA, 2004a	1.01E-02
Aquatic Invertebrates, Acute Exposures	12.5	NOEC	USDA, 2004a	5.91E-03
Aquatic Amphibians, Acute Exposures	0.38	NOEC	USDA, 2004a	1.95E-01
Aquatic Plants				
Algae, Acute Exposures	0.0025	NOEC	USDA, 2004a	2.96E+01
Macrophytes, Acute Exposures	0.000207	NOEC	USEPA, 2005c	3.57E+02

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	1.79E-09	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	1.17	NOEC	USDA, 2004a	1.53E-09
Aquatic Invertebrates, Chronic Exposures	6.1	NOEC	USEPA, 2005c	2.94E-10
Aquatic Amphibians, Chronic Exposures	0.00075	NOEC	USDA, 2004a	2.39E-06
Aquatic Plants				
Algae, Chronic Exposures	0.0025	NOEC	USDA, 2004a	7.16E-07
Macrophytes, Chronic Exposures	0.000207	NOEC	USEPA, 2005c	8.65E-06

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	7.29E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	9.61E-04	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.03E+01	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	7.29E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	1.69E-02	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.69E+00	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	7.29E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	3.15E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.58E+00	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	9.76E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.05E-01	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	9.76E-01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.82E-01	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	1.56E+01	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	2.14E+00	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	$0.398 \times BW\ SAi^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	8.78E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	7.07E+00	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	8.78E+00	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	4.22E+00	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	7.29E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	3.15E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	1.58E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	3.15E-02	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	$0.0687 \times BW\ Mc^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	$0.11 \times BW\ SM^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	7.29E-04	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	3.15E-02	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	1.58E+00	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	3.15E-02	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	779	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0737	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.99E-02	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	779	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	0.0737	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.08E-02	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	9.76E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	4.79E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.50E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	9.76E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	4.79E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	8.96E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	1.56E+01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	7.67E+00	mg/kg	C_0 (mg/kg) × (1-e$^{-K (1/day) \times T (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.05E+00	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.54E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.57E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.37E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.54E-02	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	7.57E-03	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.42E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.47E-01	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	1.21E-01	mg/kg	C_0 (mg/kg) × (1-e$^{-K (1/day) \times T (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	1.66E-02	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	3.71E-09	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	2.01E-09	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	3.33	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.58E-08	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	3.46E-08	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	3.33	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.58E-08	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	3.88E-09	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute Exposures (On-Site)				
Direct Spray				
Bee	F01a	1.03E+01	268.8	3.84E-02
Small Bird	F01b	1.69E+00	810	2.09E-03
Small Mammal	F01c	1.58E+00	668.74	2.36E-03
Ingestion of Contaminated Vegetation				
Small Avian Herbivore	F02a	3.05E-01	810	3.77E-04
Small Mammal Herbivore	F02b	1.82E-01	668.74	2.73E-04
Large Mammal Herbivore	F02c	2.14E+00	668.74	3.20E-03
Ingestion of Contaminated Insects				
Small Avian Insectivore	F03a	7.07E+00	810	8.73E-03
Small Mammal Insectivore	F03b	4.22E+00	668.74	6.31E-03
Ingestion of Contaminated Small Mammals				
Avian Carnivore	F04a	3.15E-02	810	3.89E-05
Mammalian Carnivore	F04b	3.15E-02	668.74	4.72E-05
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	1.99E-02	810	2.46E-05
Small Mammal Herbivore	F05b	1.08E-02	668.74	1.61E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEC) for Insects	268.8	USEPA, 2005c
Toxicity (NOEL) for Birds	810	USEPA, 2005c
Toxicity (NOEL) for Mammals	668.74	Health Canada, 1998

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Vegetation (On-Site)				
Small Avian Herbivore	F06a	1.50E-01	8.1	1.85E-02
Small Mammal Herbivore	F06b	8.96E-02	24.4	3.67E-03
Large Mammal Herbivore	F06c	1.05E+00	24.4	4.31E-02
Ingestion of Contaminated Vegetation (Off-Site)				
Small Avian Herbivore	F07a	2.37E-03	8.1	2.93E-04
Small Mammal Herbivore	F07b	1.42E-03	24.4	5.80E-05
Large Mammal Herbivore	F07c	1.66E-02	24.4	6.81E-04
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	3.71E-09	8.1	4.58E-10
Small Mammal Herbivore	F08b	2.01E-09	24.4	8.26E-11
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	3.46E-08	8.1	4.27E-09
Mammalian Piscivore	F09b	3.88E-09	24.4	1.59E-10

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (--) for Insects	--	--
Toxicity (NOEL) for Birds	8.1	imated from acute NOEL
Toxicity (NOEL) for Mammals	24.4	Health Canada, 1998

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	7.37E-02	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	95	NOEL	USEPA, 2005c	7.76E-04
Aquatic Invertebrates, Acute Exposures	96	NOEL	USEPA, 2005c	7.68E-04
Aquatic Amphibians, Acute Exposures	--	--	--	--
Aquatic Plants				
Algae, Acute Exposures	0.188	NOEL	USEPA, 2005c	3.92E-01
Macrophytes, Acute Exposures	0.0005	NOEL	USEPA, 2005c	1.47E+02

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	1.38E-08	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	100	NOEL	USEPA, 2005c	1.38E-10
Aquatic Invertebrates, Chronic Exposures	102	NOEL	USEPA, 2005c	1.35E-10
Aquatic Amphibians, Chronic Exposures	--	--	--	--
Aquatic Plants				
Algae, Chronic Exposures	0.188	NOEL	USEPA, 2005c	7.32E-08
Macrophytes, Chronic Exposures	0.0005	NOEL	USEPA, 2005c	2.75E-05

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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F01a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site bee, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW B	Body Weight (BW) - Bee (B)	0.000093	kg	USDA, 1993
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264	m^2	$0.11 \times BW\ B^{0.65}$ (kg)
	Units Converted	2.64	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	8.44E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the bee (B)				
Amt B 1	Application Rate #1	1.11E-02	mg	$0.5 \times SA\ B\ (cm^2) \times R\ (mg/cm^2)$
Estimated acute absorbed dose for the on-site bee, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.20E+02	mg/kg/day	Amt B (mg) / BW B (kg) / T (day)

F01b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small bird, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SB	Body Weight (BW) - Small Bird (SB)	10	g	Assumed
	Units Converted	0.01	kg	0.001 kg per g
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.5	cm^2	10 x BW SB $^{0.667}$ (g)
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	8.44E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small bird (SB)				
Amt SB 1	Application Rate #1	1.96E-01	mg	0.5 × SA SB (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small bird, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.96E+01	mg/kg/day	Amt SB (mg) / BW SB (kg) / T (day)

F01c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Direct spray of an on-site small mammal, assuming 100% absorption over the first 24-hour period

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	8.44E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	3.65E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Estimated acute absorbed dose for the on-site small mammal, assuming 100% absorption over the first 24-hour period				
Dose 1	Application Rate #1	1.83E+01	mg/kg/day	Amt SM (mg) / BW SM (kg) / T (day)

F02a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.13E+01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	3.54E+00	mg/kg/day	FIR SAh (kg/day) × C FR2 (mg/kg) / BW SAh (kg)

F02b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C FR2 1	Application Rate #1	1.13E+01	mg/kg	RR FR2 (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal herbivore from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	2.11E+00	mg/kg/day	FIR SMh (kg/day) × C FR2 (mg/kg) / BW SMh (kg)

F02c

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Concentration (C) on short grass (SG)				
C SG 1	Application Rate #1	1.81E+02	mg/kg	RR SG (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site large mammal herbivore from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	2.48E+01	mg/kg/day	FIR LMh (kg/day) × C SG (mg/kg) / BW LMh (kg)

F03a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small avian insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	8.05	g/day	0.398 x BW SAi $^{0.85}$ (g) / 1 - FWC I
	Units Converted	0.00805	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.02E+02	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small avian insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	8.19E+01	mg/kg/day	FIR SAi (kg/day) × C I (mg/kg) / BW SAi (kg)

F03b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated insects by an on-site small mammal insectivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	9.61	g/day	0.621 x BW SMi $^{0.564}$ (g) / 1 - FWC I
	Units Converted	0.00961	kg/day	0.001 kg per g
FWC I	Fraction of Water Content (FWC) - Small insects (I)	0.65	unitless	USEPA, 1993
RR I	Residual Deposition Rate (RR) - Small insects (I)	135	mg/kg per lb/acre	Fletcher et al., 1994
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Concentration (C) on small insects (I)				
C I 1	Application Rate #1	1.02E+02	mg/kg	RR I (mg/kg per lb/acre) × R (lb/acre)
Estimated acute dose for the on-site small mammal insectivore from the ingestion of contaminated small insects				
Dose 1	Application Rate #1	4.89E+01	mg/kg/day	FIR SMi (kg/day) × C I (mg/kg) / BW SMi (kg)

F04a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site avian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	1	kg	Assumed
	Units Converted	500	g	0.001 kg per g
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	107	g/day	0.301 x BW Ac $^{0.751}$ (g) / 1 - FWC SM
	Units Converted	0.107	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	0.11 x BW SM $^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	8.44E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	3.65E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	1.83E+01	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site avian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	3.65E-01	mg/kg/day	C SM (mg/kg) × FIR Ac (kg/day) / BW Ac (kg)

F04b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated small mammals by an on-site mammalian carnivore, shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5	kg	Assumed
	Units Converted	5,000	g	0.001 kg per g
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	251	g/day	$0.0687 \times BW\ Mc^{0.822}$ (g) / 1 - FWC SM
	Units Converted	0.251	kg/day	0.001 kg per g
FWC SM	Fraction of Water Content (FWC) - Small mammals (SM)	0.70	unitless	USEPA, 1993
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.00865	m^2	$0.11 \times BW\ SM^{0.65}$ (kg)
	Units Converted	86.5	cm^2	10000 cm^2 per m^2
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	8.44E-03	mg/cm^2	0.01121 mg/cm^2 per lb/acre
Amount deposited (Amt) on the small mammal (SM)				
Amt SM 1	Application Rate #1	3.65E-01	mg	0.5 × SA SM (cm^2) × R (mg/cm^2)
Concentration (C) on the small mammal (SM)				
C SM 1	Application Rate #1	1.83E+01	mg/kg	Amt SM (mg) / BW SM (kg)
Estimated acute dose for the on-site mammalian carnivore from the ingestion of contaminated small mammals				
Dose 1	Application Rate #1	3.65E-01	mg/kg/day	C SM (mg/kg) × FIR Mc (kg/day) / BW Mc (kg)

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	379	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	4.511	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	4,511	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	1.71	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	4.61E-01	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	379	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	4.511	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	4,511	mg/L	1000 mg/L per mg/mL
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	1.71	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	2.50E-01	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F06a

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.13E+01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.67E+00	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	8.37E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F06b

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.13E+01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	2.67E+00	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the on-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	5.00E-01	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F06c

ECOLOGICAL - ON-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an on-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,606	g/day	0.577 x BW LMh $^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.606	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	1.81E+02	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	4.28E+01	mg/kg	C_0 (mg/kg) × (1-e$^{-K\ (1/day) \times T\ (day)}$) / K (1/day) × T (day)
Estimated chronic dose for the on-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	5.87E+00	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F07a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small avian herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01	kg	Assumed
	Units Converted	10	g	0.001 kg per g
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3.13	g/day	0.398 x BW SAh $^{0.85}$ (g) / 1 - FWC FR2
	Units Converted	0.00313	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.78E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	4.22E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small bird from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	1.32E-02	mg/kg/day	TWA C FR2 (mg/kg) × FIR SAh (kg/day) × PropDC / BW SAh (kg)

F07b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site small mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
	Units Converted	20	g	0.001 kg per g
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3.74	g/day	0.621 x BW SMh $^{0.564}$ (g) / 1 - FWC FR2
	Units Converted	0.00374	kg/day	0.001 kg per g
FWC FR2	Fraction of Water Content (FWC) - Fruits, pods, seeds, and large insects (FR2)	0.10	unitless	USEPA, 1993
RR FR2	Residual Deposition Rate (RR) - Fruits, pods, seeds, and large insects (FR2)	15	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial (0) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
C 0 1	Application Rate #1	1.78E-01	mg/kg	R (lb/acre) × Drift × RR FR2 (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on fruits, pods, seeds, and large insects (FR2)				
TWA C FR2 1	Application Rate #1	4.22E-02	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated fruits, pods, seeds, and large insects				
Dose 1	Application Rate #1	7.90E-03	mg/kg/day	TWA C FR2 (mg/kg) × FIR SMh (kg/day) × PropDC / BW SMh (kg)

F07c

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated vegetation by an off-site large mammal herbivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70.00	kg	Assumed
	Units Converted	70,000	g	0.001 kg per g
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	9,605.77	g/day	$0.577 \times BW\ LMh^{0.727}$ (g) / 1 - FWC SG
	Units Converted	9.60577	kg/day	0.001 kg per g
FWC SG	Fraction of Water Content (FWC) - Short grass (SG)	0.80	unitless	USEPA, 1993
RR SG	Residual Deposition Rate (RR) - Short grass (SG)	240	mg/kg per lb/acre	Fletcher et al., 1994
PropDC	Proportion of diet contaminated (PropDC)	1	unitless	Assumed (100%)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (days)
Application rates (*R*)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial (0) concentration (C) on short grass (SG)				
C 0 1	Application Rate #1	2.86E+00	mg/kg	R (lb/acre) × Drift × RR SG (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on short grass (SG)				
TWA C SG 1	Application Rate #1	6.76E-01	mg/kg	C_0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / K (1/day) × T (day)
Estimated chronic dose for the off-site large mammal from the ingestion of contaminated short grass				
Dose 1	Application Rate #1	9.28E-02	mg/kg/day	TWA C SG (mg/kg) × FIR LMh (kg/day) × PropDC / BW LMh (kg)

F08a

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small bird, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	$0.059 \times BW\ SB^{0.67}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Estimated chronic dose for the off-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.84E-07	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)

F08b

ECOLOGICAL - OFF-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an off-site small mammal, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Estimated chronic dose for the off-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	9.97E-08	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)

F09a

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site avian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3	kg	Assumed
	Units Converted	300	g	0.001 kg per g
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	226	g/day	$10^{0.966 \times \log(\text{BW Ap})(g) - 0.64}$ / 1 - FWC FS
	Units Converted	0.226	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	8.13	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.54E-06	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site avian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	4.18E-06	mg/kg/day	C F (mg/kg) × FIR Ap (kg/day) / BW Ap (kg)

F09b

ECOLOGICAL - OFF-SITE CHRONIC EXPOSURE SCENARIO
Ingestion of contaminated fish by an off-site mammalian piscivore, 90-day period beginning shortly after application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	Beginning shortly after application
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75	kg	Assumed
	Units Converted	750	g	0.001 kg per g
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	63	g/day	0.0687 x BW Mp $^{0.822}$ (g) / 1 - FWC FS
	Units Converted	0.063	kg/day	0.001 kg per g
FWC FS	Fraction of Water Content (FWC) - Fish (FS)	0.75	unitless	USEPA, 1993
BCF	Bioconcentration factor (BCF)	8.13	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.54E-06	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose for the off-site mammalian piscivore from the ingestion of contaminated fish				
Dose 1	Application Rate #1	4.68E-07	mg/kg/day	C F (mg/kg) × FIR Mp (kg/day) / BW Mp (kg)

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute Exposures (On-Site)				
Direct Spray				
Bee	F01a	1.20E+02	1,075	1.11E-01
Small Bird	F01b	1.96E+01	735.0	2.67E-02
Small Mammal	F01c	1.83E+01	30	6.09E-01
Ingestion of Contaminated Vegetation				
Small Avian Herbivore	F02a	3.54E+00	735.0	4.81E-03
Small Mammal Herbivore	F02b	2.11E+00	30	7.04E-02
Large Mammal Herbivore	F02c	2.48E+01	30	8.27E-01
Ingestion of Contaminated Insects				
Small Avian Insectivore	F03a	8.19E+01	735.0	1.11E-01
Small Mammal Insectivore	F03b	4.89E+01	30	1.63E+00
Ingestion of Contaminated Small Mammals				
Avian Carnivore	F04a	3.65E-01	735.0	4.97E-04
Mammalian Carnivore	F04b	3.65E-01	30	1.22E-02
Ingestion of Contaminated Surface Water				
Small Avian Herbivore	F05a	4.61E-01	735.0	6.27E-04
Small Mammal Herbivore	F05b	2.50E-01	30	8.33E-03

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEL) for Insects	1,075	USEPA, 2005
Toxicity (LD50) for Birds	735.0	USEPA, 2005
Toxicity (NOAEL) for Mammals	30	USDA, 2003

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic Exposures (On-Site and Off-Site)				
Ingestion of Contaminated Vegetation (On-Site)				
Small Avian Herbivore	F06a	8.37E-01	10	8.37E-02
Small Mammal Herbivore	F06b	5.00E-01	5	1.00E-01
Large Mammal Herbivore	F06c	5.87E+00	5	1.17E+00
Ingestion of Contaminated Vegetation (Off-Site)				
Small Avian Herbivore	F07a	1.32E-02	10	1.32E-03
Small Mammal Herbivore	F07b	7.90E-03	5	1.58E-03
Large Mammal Herbivore	F07c	9.28E-02	5	1.86E-02
Ingestion of Contaminated Surface Water (Off-Site)				
Small Avian Herbivore	F08a	1.84E-07	10	1.84E-08
Small Mammal Herbivore	F08b	9.97E-08	5	1.99E-08
Ingestion of Contaminated Fish (Off-Site)				
Avian Piscivore	F09a	4.18E-06	10	4.18E-07
Mammalian Piscivore	F09b	4.68E-07	5	9.37E-08

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Chronic	Reference
Toxicity (NOAEL) for Birds	10	USDA, 2003
Toxicity (NOAEL) for Mammals	5	USDA, 2003

G02

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Acute	1.71E+00	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Acute Exposures	98	NOEL	USEPA, 2005	1.74E-02
Aquatic Invertebrates, Acute Exposures	132	NOEL	USEPA, 2005	1.29E-02
Aquatic Amphibians, Acute Exposures	--	--	--	--
Aquatic Plants				
Algae, Acute Exposures	2	NOEL	USEPA, 2005	8.54E-01
Macrophytes, Acute Exposures	7.8	NOEL	USEPA, 2005	2.19E-01

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

G03

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Offsite

	Application Rate #1	Units	Reference / Calculation
Concentration in Water (mg/L)			
Concentration in (C) Water (W) Chronic (Maximum 50% UCL)	6.81E-07	mg/L	See Section 2

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1
Aquatic Animals				
Fish, Chronic Exposures	104	NOEL	USEPA, 2005	6.55E-09
Aquatic Invertebrates, Chronic Exposures	80.7	--	--	8.44E-09
Aquatic Amphibians, Chronic Exposures	--	--	--	--
Aquatic Plants				
Algae, Chronic Exposures	2	NOEL	USEPA, 2005	3.41E-07
Macrophytes, Chronic Exposures	7.8	NOEL	USEPA, 2005	8.73E-08

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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RECEPTOR INPUTS - ECOLOGICAL
Body Weights, Surface Areas and Caloric Content for Ecological Receptors

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Body Weights				
BW B	Body Weight (BW) - Bee (B)	0.000093		USDA, 1993
BW SAh	Body Weight (BW) - Small Avian Herbivore (SAh)	0.01		Assumed
BW SAi	Body Weight (BW) - Small Avian Insectivore (SAi)	0.01		Assumed
BW SB	Body Weight (BW) - Small Bird (SB)	0.01		Assumed
BW Ac	Body Weight (BW) - Avian Carnivore (Ac)	0.5		Assumed
BW Ap	Body Weight (BW) - Avian Piscivore (Ap)	0.3		Assumed
BW SMh	Body Weight (BW) - Small Mammal Herbivore (SMh)	0.02	kg	Assumed
BW SMi	Body Weight (BW) - Small Mammal Insectivore (SMi)	0.02		Assumed
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02		Assumed
BW LMh	Body Weight (BW) - Large Mammal Herbivore (LMh)	70		Assumed
BW LM	Body Weight (BW) - Large Mammal (LM)	70		Assumed
BW Mc	Body Weight (BW) - Mammalian Carnivore (Mc)	5		Assumed
BW Mp	Body Weight (BW) - Mammalian Piscivore (Mp)	0.75		Assumed
Surface Areas				
SA B	Exposed Surface Area (SA) - Bee (B)	0.000264		0.11 x BW B (kg) ^ 0.65
SA SAh	Exposed Surface Area (SA) - Small Avian Herbivore (SAh)	46.45153		10 x BW SAh (g) ^ 0.667
SA SAi	Exposed Surface Area (SA) - Small Avian Insectivore (SAi)	46.45153		10 x BW SAi (g) ^ 0.667
SA SB	Exposed Surface Area (SA) - Small Bird (SB)	46.45153		10 x BW SB (g) ^ 0.667
SA Ac	Exposed Surface Area (SA) - Avian Carnivore (Ac)	631.2669		10 x BW Ac (g) ^ 0.667
SA Ap	Exposed Surface Area (SA) - Avian Piscivore (Ap)	448.9933		10 x BW Ap (g) ^ 0.667
SA SMh	Exposed Surface Area (SA) - Small Mammal Herbivore (SMh)	0.008651	cm^2	0.11 x BW SMh (kg) ^ 0.65
SA SMi	Exposed Surface Area (SA) - Small Mammal Insectivore (SMi)	0.008651		0.11 x BW SMi (kg) ^ 0.65
SA SM	Exposed Surface Area (SA) - Small Mammal (SM)	0.008651		0.11 x BW SM (kg) ^ 0.65
SA LMh	Exposed Surface Area (SA) - Large Mammal Herbivore (LMh)	1.74063		0.11 x BW LMh (kg) ^ 0.65
SA LM	Exposed Surface Area (SA) - Large Mammal (LM)	1.74063		0.11 x BW LM (kg) ^ 0.65
SA Mc	Exposed Surface Area (SA) - Mammalian Carnivore (Mc)	0.313129		0.11 x BW Mc (kg) ^ 0.65
SA Mp	Exposed Surface Area (SA) - Mammalian Piscivore (Mp)	0.091239		0.11 x BW Mp (kg) ^ 0.65

A02b

RECEPTOR INPUTS - ECOLOGICAL
Body Weights, Surface Areas and Caloric Content for Ecological Receptors

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Food Ingestion Rates				
FIR SAh	Food Ingestion Rate (FIR) - Small Avian Herbivore (SAh)	3		0.398 x BW (g) ^ 0.85
FIR SAi	Food Ingestion Rate (FIR) - Small Avian Insectivore (SAi)	3		0.398 x BW (g) ^ 0.85
FIR SB	Food Ingestion Rate (FIR) - Small Bird (SB)	3		0.398 x BW (g) ^ 0.85
FIR Ac	Food Ingestion Rate (FIR) - Avian Carnivore (Ac)	32		0.301 x BW (g) ^ 0.751
FIR Ap	Food Ingestion Rate (FIR) - Avian Piscivore (Ap)	57		10^ [0.966 x log (BW) (g) - 0.64]
FIR SMh	Food Ingestion Rate (FIR) - Small Mammal Herbivore (SMh)	3		0.621 x BW (g) ^ 0.564
FIR SMi	Food Ingestion Rate (FIR) - Small Mammal Insectivore (SMi)	3	cm^2	0.621 x BW (g) ^ 0.564
FIR SM	Food Ingestion Rate (FIR) - Small Mammal (SM)	3		0.621 x BW (g) ^ 0.564
FIR LMh	Food Ingestion Rate (FIR) - Large Mammal Herbivore (LMh)	1921		0.577 x BW (g) ^ 0.727
FIR LM	Food Ingestion Rate (FIR) - Large Mammal (LM)	1921		0.577 x BW (g) ^ 0.727
FIR Mc	Food Ingestion Rate (FIR) - Mammalian Carnivore (Mc)	75		0.0687 x BW (g) ^ 0.822
FIR Mp	Food Ingestion Rate (FIR) - Mammalian Piscivore (Mp)	16		0.0687 x BW (g) ^ 0.822
SA Mp	Exposed Surface Area (SA) - Mammalian Piscivore (Mp)	0		0.11 x BW Mp (kg) ^ 0.65
Water Ingestion Rates				
WIR SAh	Water Ingestion Rate (WIR) - Small Avian Herbivore (SAh)	0.000117		0.059 x BW (kg) ^ 0.67
WIR SAi	Water Ingestion Rate (WIR) - Small Avian Insectivore (SAi)	0.002697		0.059 x BW (kg) ^ 0.67
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.002697		0.059 x BW (kg) ^ 0.67
WIR Ac	Water Ingestion Rate (WIR) - Avian Carnivore (Ac)	0.002697		0.059 x BW (kg) ^ 0.67
WIR Ap	Water Ingestion Rate (WIR) - Avian Piscivore (Ap)	0.037082		0.059 x BW (kg) ^ 0.67
WIR SMh	Water Ingestion Rate (WIR) - Small Mammal Herbivore (SMh)	0.0335	L/day	0.099 x BW (kg) ^ 0.9
WIR SMi	Water Ingestion Rate (WIR) - Small Mammal Insectivore (SMi)	0.002928		0.099 x BW (kg) ^ 0.9
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.002928		0.099 x BW (kg) ^ 0.9
WIR LMh	Water Ingestion Rate (WIR) - Large Mammal Herbivore (LMh)	0.002928		0.099 x BW (kg) ^ 0.9
WIR LM	Water Ingestion Rate (WIR) - Large Mammal (LM)	4.531306		0.099 x BW (kg) ^ 0.9
WIR Mc	Water Ingestion Rate (WIR) - Mammalian Carnivore (Mc)	4.531306		0.099 x BW (kg) ^ 0.9
WIR Mp	Water Ingestion Rate (WIR) - Mammalian Piscivore (Mp)	0.421413		0.099 x BW (kg) ^ 0.9

F05a

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small bird, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	11	L	Estimated
BW SB	Body Weight (BW) - Small Bird (SB)	0.01	kg	Assumed
WIR SB	Water Ingestion Rate (WIR) - Small Bird (SB)	0.003	L/day	0.059 x BW SB $^{0.67}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	89,880	mg/mL	Product Label (G-4), C&P Press, 2005
C F 2	Application Rate #2	89,880		
	Application Rate #1 (Units Converted)	89,879,600	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	89,879,600		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	1,021	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	1,021		
Estimated acute dose for the on-site small bird from the ingestion of contaminated water				
Dose 1	Application Rate #1	2.75E+02	mg/kg/day	C W (mg/L) × WIR SB (L/day) / BW SB (kg)
Dose 2	Application Rate #2	2.75E+02		

F05b

ECOLOGICAL - ON-SITE ACUTE EXPOSURE SCENARIO
Ingestion of contaminated surface water by an on-site small mammal, following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	1	day	24 hours
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	11	L	Estimated
BW SM	Body Weight (BW) - Small Mammal (SM)	0.02	kg	Assumed
WIR SM	Water Ingestion Rate (WIR) - Small Mammal (SM)	0.003	L/day	0.099 x BW SM $^{0.9}$ (kg)
Concentration (C) in field solution (F)				
C F 1	Application Rate #1	89,880	mg/mL	Product Label (G-4), C&P Press, 2005
C F 2	Application Rate #2	89,880		
	Application Rate #1 (Units Converted)	89,879,600	mg/L	1000 mg/L per mg/mL
	Application Rate #2 (Units Converted)	89,879,600		
Concentration (C) in ambient water (W)				
C W 1	Application Rate #1	1,021	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	1,021		
Estimated acute dose for the on-site small mammal from the ingestion of contaminated water				
Dose 1	Application Rate #1	1.49E+02	mg/kg/day	C W (mg/L) × WIR SM (L/day) / BW SM (kg)
Dose 2	Application Rate #2	1.49E+02		

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2
Acute Exposures (On-Site)						
Ingestion of Contaminated Surface Water						
Small Avian Herbivore	F05a	2.75E+02	2.75E+02	73.5	3.75E+00	3.75E+00
Small Mammal Herbivore	F05b	1.49E+02	1.49E+02	30	4.98E+00	4.98E+00

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

Toxicty Indicies	Acute	Reference
Toxicity (NOEL) for Birds	73.5	Estimated from minimum LD50
Toxicity (NOAEL) for Mammals	30	USDA, 2003b

G01

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for terrestrial species

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)	Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2		Application Rate #1	Application Rate #2

ECOLOGICAL SUMMARY TABLES
Summary of quantitative risk characterization for aquatic species - Onsite

	Application Rate #1	Application Rate #2	Units	Reference / Calculation
Concentration in Water (mg/L)				
Concentration in (C) Water (W) Acute	1.02E+03	1.02E+03	mg/L	Worksheet F05

Scenario	Toxicity Endpoints			Hazard Quotient C W (mg/L) ÷ Toxicity (mg/L)	
	Toxicity (mg/L)	Endpoint	Reference	Application Rate #1	Application Rate #2
Aquatic Animals					
Fish, Acute Exposures	0.2	NOEL	USEPA, 2005c	5.10E+03	5.10E+03
Aquatic Invertebrates, Acute Exposures	0.27	NOEL	USEPA, 2005c	3.78E+03	3.78E+03
Aquatic Amphibians, Acute Exposures	--	--	--	--	--
Aquatic Plants					
Algae, Acute Exposures	0.002	NOEL	USEPA, 2005c	5.10E+05	5.10E+05
Macrophytes, Acute Exposures	3	NOEC	USDA, 2003b	3.40E+02	3.40E+02

Notes:

-- No toxicity information was identified from the literature
Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, Application Rate #3 limit)
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	4.39E-01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	4.39E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS

General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, Application Rate #3 limit)
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	9.66E+00	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	8.70E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.40E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.526	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.526	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	1.47E-07	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.40E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.526	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.526	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	8.85E-06	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.67E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	4.67E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.5262	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	3.54E+00	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	2.36E-05	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.67E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	4.67E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.5262	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	8.71E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	5.81E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.67E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	4.67E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.526	mg/mL	See Section 2
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	3.34E+01	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	1.04E-03	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.67E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	4.67E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.526	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	8.71E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	6.36E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	4.67.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	1.12E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.231	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1231	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.14E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	9.07E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	6.74E-04	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	4.67.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	1.12E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.231	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1231	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.14E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	4.19E-01	mg	TR ($mg/cm^2/hour$) × Tc (hour) × SA FA1 (cm^2)
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	7.30E-05	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	7.69E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.74E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	7.69E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	3.73E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	0.526	mg/mL	See Section 2
	Central (Units Converted)	526	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.98E-05	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	4.98E-06	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.21E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	4.18E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	4.18E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	9.47E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	23	days	GLEAMS
K	Decay coefficient (K)	3.01E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.110	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.21E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	4.18E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	4.18E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.03E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	5.15E-10	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	1.77E-10	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00388	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.00E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	1.07E-14	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00388	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.00E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	2.29E-15	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00388	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.00E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	9.33E-14	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00388	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.15E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.00E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	2.00E-14	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	4.39E-03	Chronic	0.50	8.78E-03
boom spray (hydraulic ground spray) application	C01b	8.70E-03	Chronic	0.50	1.74E-02
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	1.47E-07	Acute	0.50	2.95E-07
wearing contaminated gloves for 1 hour	C02b	8.85E-06	Acute	0.50	1.77E-05
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	2.36E-05	Acute	0.50	4.72E-05
accidental spill to lower legs	C03b	5.81E-05	Acute	0.50	1.16E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	1.04E-03	Acute	0.50	2.08E-03
adult female, lower legs	D01b	6.36E-05	Acute	0.50	1.27E-04
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	6.74E-04	Acute	0.50	1.35E-03
adult female, hands, forearms, feet & lower legs	D02b	7.30E-05	Acute	0.50	1.46E-04
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.74E-04	Acute	0.50	3.48E-04
adult consuming fruits	D03b	3.73E-05	Acute	0.50	7.47E-05
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	4.98E-06	Acute	0.50	9.96E-06

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	9.47E-07	Chronic	0.50	1.89E-06
adult consuming fruits	D05b	2.03E-07	Chronic	0.50	4.06E-07
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	5.15E-10	Chronic	0.50	1.03E-09
adult	D06b	1.77E-10	Chronic	0.50	3.53E-10
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	1.07E-14	Chronic	0.50	2.13E-14
adult recreational fishermen	D07b	2.29E-15	Chronic	0.50	4.57E-15
children of subsistence populations	D07c	9.33E-14	Chronic	0.50	1.87E-13
adults of subsistence populations	D07d	2.00E-14	Chronic	0.50	4.00E-14

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.012	lb/acre	Texas, 2004
R 2	Application Rate #2	0.024		
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	4.89E-02	lb/day	ATD (acres/day) × R (lb/acre)
AHD B 2	Application Rate #2	9.78E-02		
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	4.89E-04	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	9.78E-04		

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.012	lb/acre	Texas, 2004
R 2	Application Rate #2	0.024		
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	1.08E+00	lb/day	ATD (acres/day) × R (lb/acre)
AHD S 2	Application Rate #2	2.15E+00		
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	9.68E-04	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	1.94E-03		

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	3.44E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.146	mg/mL	See Section 2
C F 2	Application Rate #2	0.293		
	Application Rate #1 (Units Converted)	0.146	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	0.293		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	1.01E-07	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	2.01E-07		

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	3.44E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.146	mg/mL	See Section 2
C F 2	Application Rate #2	0.293		
	Application Rate #1 (Units Converted)	0.146	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	0.293		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	6.04E-06	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.21E-05		

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.79E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	1.79E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.1465	mg/mL	See Section 2
C F 2	Application Rate #2	0.2930		
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	9.84E-01	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Amt H 2	Application Rate #2	1.97E+00		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	2.51E-06	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	5.02E-06		

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.79E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	1.79E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.1465	mg/mL	See Section 2
C F 2	Application Rate #2	0.2930		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.43E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	4.85E+00		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	6.19E-06	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.24E-05		

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.79E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	1.79E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.146	mg/mL	See Section 2
C F 2	Application Rate #2	0.293		
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	9.29E+00	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Amt C 2	Application Rate #2	1.86E+01		
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	1.11E-04	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	2.21E-04		

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.79E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	1.79E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.146	mg/mL	See Section 2
C F 2	Application Rate #2	0.293		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.43E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	4.85E+00		
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	6.77E-06	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)
Dose 2	Application Rate #2	1.35E-05		

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	1.79.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	4.28E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
	Application Rate #1 (Units Converted)	0.137	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	0.274		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0137	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.0274		
Transfer Rate (TR)				
TR 1	Application Rate #1	1.05E-05	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	2.23E-05		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	8.29E-02	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
AmtSS 2	Application Rate #2	1.76E-01		
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	2.36E-05	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	5.03E-05		

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	1.79.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	4.28E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
	Application Rate #1 (Units Converted)	0.137	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	0.274		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0137	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.0274		
Transfer Rate (TR)				
TR 1	Application Rate #1	1.05E-05	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	2.23E-05		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	3.83E-02	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
AmtSS 2	Application Rate #2	8.16E-02		
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	2.56E-06	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)
Dose 2	Application Rate #2	5.45E-06		

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	8.56E-02	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	1.71E-01		
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.94E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	3.88E-05		

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	8.56E-02	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	1.71E-01		
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	4.16E-06	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	8.31E-06		

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	0.146	mg/mL	See Section 2
C F 2	Lower	0.293		
	Central (Units Converted)	146	mg/L	1000 mg/L per mg/mL
	Lower (Units Converted)	293		
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.39E-05	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	2.77E-05		
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.39E-06	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	2.77E-06		

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.35E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	2.70E-03		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.69E-04	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day) \times T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	1.14E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.69E-04	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	1.14E-03		
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.29E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	2.58E-07		

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	30	days	GLEAMS
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.0122	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0245		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.35E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	2.70E-03		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.69E-04	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day) \times T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	1.14E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.69E-04	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	1.14E-03		
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.76E-08	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	5.53E-08		

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Estimated acute dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	7.18E-10	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	1.44E-09		

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	2.46E-10	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)
Dose 2	Application Rate #2	4.92E-10		

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.102	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	7.34E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.47E-09		
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	3.92E-13	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)
Dose 2	Application Rate #2	7.83E-13		

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.102	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	7.34E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.47E-09		
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	8.39E-14	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)
Dose 2	Application Rate #2	1.68E-13		

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.102	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	7.34E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.47E-09		
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	3.43E-12	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)
Dose 2	Application Rate #2	6.85E-12		

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.102	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.18E-09	mg/L	See Section 2
C W 2	Application Rate #2	1.44E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	7.34E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.47E-09		
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	7.34E-13	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)
Dose 2	Application Rate #2	1.47E-12		

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Accidental / Incidental Exposures - Chronic							
General Exposures - Direct Spray							
direct foliar (backpack) application	C01a	4.89E-04	9.78E-04	Chronic	0.20	2.45E-03	4.89E-03
boom spray (hydraulic ground spray) application	C01b	9.68E-04	1.94E-03	Chronic	0.20	4.84E-03	9.68E-03
Accidental / Incidental Exposures - Acute							
Dermal Exposures - Wearing Contaminated Gloves							
wearing contaminated gloves for 1 minute	C02a	1.01E-07	2.01E-07	Acute	0.20	5.04E-07	1.01E-06
wearing contaminated gloves for 1 hour	C02b	6.04E-06	1.21E-05	Acute	0.20	3.02E-05	6.04E-05
Dermal Exposures - Accidental Spill							
accidental spill to hands	C03a	2.51E-06	5.02E-06	Acute	0.20	1.26E-05	2.51E-05
accidental spill to lower legs	C03b	6.19E-06	1.24E-05	Acute	0.20	3.09E-05	6.19E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Acute / Accidental Exposures							
General Exposures - Direct Spray							
children, total body	D01a	1.11E-04	2.21E-04	Acute	0.20	5.53E-04	1.11E-03
adult female, lower legs	D01b	6.77E-06	1.35E-05	Acute	0.20	3.38E-05	6.77E-05
Dermal Exposures - Contact with Contaminated Vegetation							
children, total body	D02a	2.36E-05	5.03E-05	Acute	0.20	1.18E-04	2.52E-04
adult female, hands, forearms, feet & lower legs	D02b	2.56E-06	5.45E-06	Acute	0.20	1.28E-05	2.72E-05
Ingestion Exposures - Consumption of Contaminated Vegetation							
children consuming fruits	D03a	1.94E-05	3.88E-05	Acute	0.20	9.70E-05	1.94E-04
adult consuming fruits	D03b	4.16E-06	8.31E-06	Acute	0.20	2.08E-05	4.16E-05
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill							
children	D04	1.39E-06	2.77E-06	Acute	0.20	6.93E-06	1.39E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Chronic / Longer Term Exposures							
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application							
children consuming fruits	D05a	1.29E-07	2.58E-07	Chronic	0.20	6.45E-07	1.29E-06
adult consuming fruits	D05b	2.76E-08	5.53E-08	Chronic	0.20	1.38E-07	2.76E-07
Ingestion Exposures - Consumption of Contaminated Water							
children	D06a	7.18E-10	1.44E-09	Chronic	0.20	3.59E-09	7.18E-09
adult	D06b	2.46E-10	4.92E-10	Chronic	0.20	1.23E-09	2.46E-09
Ingestion Exposures - Consumption of Contaminated Fish							
child recreational fishermen	D07a	3.92E-13	7.83E-13	Chronic	0.20	1.96E-12	3.92E-12
adult recreational fishermen	D07b	8.39E-14	1.68E-13	Chronic	0.20	4.20E-13	8.39E-13
children of subsistence populations	D07c	3.43E-12	6.85E-12	Chronic	0.20	1.71E-11	3.43E-11
adults of subsistence populations	D07d	7.34E-13	1.47E-12	Chronic	0.20	3.67E-12	7.34E-12

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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HUMAN HEALTH SUMMARY TABLES

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	1.97E+00	lb/day	ATD (acres/day) × R (lb/acre)
AHD B 2	Application Rate #2	9.39E-01		
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	1.97E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	9.39E-03		

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	4.34E+01	lb/day	ATD (acres/day) × R (lb/acre)
AHD S 2	Application Rate #2	2.07E+01		
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	3.90E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	1.86E-02		

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.11E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	5.90	mg/mL	See Section 2
C F 2	Application Rate #2	2.81		
	Application Rate #1 (Units Converted)	5.90	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	2.81		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	1.32E-06	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	6.26E-07		

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.11E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	5.90	mg/mL	See Section 2
C F 2	Application Rate #2	2.81		
	Application Rate #1 (Units Converted)	5.90	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	2.81		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	7.89E-05	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	3.76E-05		

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.92E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	2.91E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	5.90	mg/mL	See Section 2
C F 2	Application Rate #2	2.81		
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	3.97E+01	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Amt H 2	Application Rate #2	1.89E+01		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	1.65E-04	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	7.87E-05		

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.92E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	2.91E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	5.90	mg/mL	See Section 2
C F 2	Application Rate #2	2.81		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	9.78E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	4.66E+01		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	4.07E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.94E-04		

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.92E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	2.91E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	5.90	mg/mL	See Section 2
C F 2	Application Rate #2	2.81		
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	3.75E+02	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Amt C 2	Application Rate #2	1.78E+02		
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	7.28E-03	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	3.47E-03		

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.92E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	2.91E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	5.90	mg/mL	See Section 2
C F 2	Application Rate #2	2.81		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	9.78E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	4.66E+01		
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	4.45E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)
Dose 2	Application Rate #2	2.12E-04		

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	2.92.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	6.97E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
	Application Rate #1 (Units Converted)	5.52	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	2.63		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.552	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.263		
Transfer Rate (TR)				
TR 1	Application Rate #1	5.88E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	2.62E-04		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	4.66E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
AmtSS 2	Application Rate #2	2.08E+00		
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	2.17E-03	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	9.65E-04		

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	2.92.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	6.97E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
	Application Rate #1 (Units Converted)	5.52	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	2.63		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.552	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.263		
Transfer Rate (TR)				
TR 1	Application Rate #1	5.88E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	2.62E-04		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	2.15E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
AmtSS 2	Application Rate #2	9.59E-01		
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	2.35E-04	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)
Dose 2	Application Rate #2	1.05E-04		

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	3.45E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	1.64E+00		
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	7.82E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	3.72E-04		

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 ± 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	3.45E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	1.64E+00		
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	1.68E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	7.98E-05		

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	5.90	mg/mL	See Section 2
C F 2	Lower	2.81		
	Central (Units Converted)	5,904	mg/L	1000 mg/L per mg/mL
	Lower (Units Converted)	2,812		
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.59E-04	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	2.66E-04		
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	5.59E-05	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	2.66E-05		

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	5.45E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	2.60E-02		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.75E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day) \times T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	8.32E-04		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.75E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	8.32E-04		
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	3.96E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	1.89E-07		

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	2	days	USDA, 2004
K	Decay coefficient (K)	3.47E-01	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.493	lb/acre	Texas, 2004
R 2	Application Rate #2	0.235		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	5.45E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	2.60E-02		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.75E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day) \times T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	8.32E-04		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.75E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	8.32E-04		
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	8.49E-08	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	4.04E-08		

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Estimated acute dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	4.11E-09	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	1.98E-10		

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	1.41E-09	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)
Dose 2	Application Rate #2	6.79E-11		

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00590	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.43E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.17E-11		
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	1.29E-13	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)
Dose 2	Application Rate #2	6.24E-15		

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00590	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.43E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.17E-11		
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	2.77E-14	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)
Dose 2	Application Rate #2	1.34E-15		

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00590	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.43E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.17E-11		
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	1.13E-12	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)
Dose 2	Application Rate #2	5.46E-14		

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00590	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.11E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.98E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.43E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	1.17E-11		
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	2.43E-13	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)
Dose 2	Application Rate #2	1.17E-14		

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Accidental / Incidental Exposures - Chronic							
General Exposures - Direct Spray							
direct foliar (backpack) application	C01a	1.97E-02	9.39E-03	Chronic	0.15	1.31E-01	6.26E-02
boom spray (hydraulic ground spray) application	C01b	3.90E-02	1.86E-02	Chronic	0.15	2.60E-01	1.24E-01
Accidental / Incidental Exposures - Acute							
Dermal Exposures - Wearing Contaminated Gloves							
wearing contaminated gloves for 1 minute	C02a	1.32E-06	6.26E-07	Acute	0.75	1.75E-06	8.35E-07
wearing contaminated gloves for 1 hour	C02b	7.89E-05	3.76E-05	Acute	0.75	1.05E-04	5.01E-05
Dermal Exposures - Accidental Spill							
accidental spill to hands	C03a	1.65E-04	7.87E-05	Acute	0.75	2.20E-04	1.05E-04
accidental spill to lower legs	C03b	4.07E-04	1.94E-04	Acute	0.75	5.43E-04	2.59E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Acute / Accidental Exposures							
General Exposures - Direct Spray							
children, total body	D01a	7.28E-03	3.47E-03	Acute	0.75	9.70E-03	4.62E-03
adult female, lower legs	D01b	4.45E-04	2.12E-04	Acute	0.75	5.94E-04	2.83E-04
Dermal Exposures - Contact with Contaminated Vegetation							
children, total body	D02a	2.17E-03	9.65E-04	Acute	0.75	2.89E-03	1.29E-03
adult female, hands, forearms, feet & lower legs	D02b	2.35E-04	1.05E-04	Acute	0.75	3.13E-04	1.39E-04
Ingestion Exposures - Consumption of Contaminated Vegetation							
children consuming fruits	D03a	7.82E-04	3.72E-04	Acute	0.75	1.04E-03	4.97E-04
adult consuming fruits	D03b	1.68E-04	7.98E-05	Acute	0.75	2.23E-04	1.06E-04
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill							
children	D04	5.59E-05	2.66E-05	Acute	0.75	7.45E-05	3.55E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Chronic / Longer Term Exposures							
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application							
children consuming fruits	D05a	3.96E-07	1.89E-07	Chronic	0.15	2.64E-06	1.26E-06
adult consuming fruits	D05b	8.49E-08	4.04E-08	Chronic	0.15	5.66E-07	2.69E-07
Ingestion Exposures - Consumption of Contaminated Water							
children	D06a	4.11E-09	1.98E-10	Chronic	0.75	5.48E-09	2.64E-10
adult	D06b	1.41E-09	6.79E-11	Chronic	0.15	9.39E-09	4.53E-10
Ingestion Exposures - Consumption of Contaminated Fish							
child recreational fishermen	D07a	1.29E-13	6.24E-15	Chronic	0.15	8.63E-13	4.16E-14
adult recreational fishermen	D07b	2.77E-14	1.34E-15	Chronic	0.15	1.85E-13	8.91E-15
children of subsistence populations	D07c	1.13E-12	5.46E-14	Chronic	0.15	7.55E-12	3.64E-13
adults of subsistence populations	D07d	2.43E-13	1.17E-14	Chronic	0.15	1.62E-12	7.80E-14

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	4.00E-02	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	4.00E-04	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	8.80E-01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	7.92E-04	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.58E-02	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.120	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	3.79E-04	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.58E-02	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.120	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	2.27E-02	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.66E-03	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	5.64E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	8.05E-01	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	6.49E-05	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.66E-03	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	5.64E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.98E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	1.60E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.66E-03	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	5.64E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	7.60E+00	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	2.86E-03	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.66E-03	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	5.64E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.120	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.98E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	1.75E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	5.66.E-03	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	1.27E-01	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	0.112	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0112	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	8.40E-06	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	6.66E-02	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	5.64E-04	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	5.66.E-03	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	1.27E-01	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	0.112	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0112	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	8.40E-06	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	3.08E-02	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	6.11E-05	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	7.00E-02	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.59E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	7.00E-02	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	3.40E-06	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	0.120	mg/mL	See Section 2
	Central (Units Converted)	120	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.13E-05	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.13E-06	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.11E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.77E-05	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.77E-05	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	4.02E-09	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	1	days	GLEAMS
K	Decay coefficient (K)	6.93E-01	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.01	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.11E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.77E-05	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.77E-05	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	8.61E-10	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	2.16E-15	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	7.41E-16	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	730	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.58E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	8.41E-15	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	730	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.58E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	1.80E-15	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	730	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.58E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	7.36E-14	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	730	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.16E-14	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.58E-11	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	1.58E-14	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	4.00E-04	Chronic	0.80	5.00E-04
boom spray (hydraulic ground spray) application	C01b	7.92E-04	Chronic	0.80	9.90E-04
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	3.79E-04	Acute	0.80	4.73E-04
wearing contaminated gloves for 1 hour	C02b	2.27E-02	Acute	0.80	2.84E-02
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	6.49E-05	Acute	0.80	8.11E-05
accidental spill to lower legs	C03b	1.60E-04	Acute	0.80	2.00E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	2.86E-03	Acute	0.80	3.57E-03
adult female, lower legs	D01b	1.75E-04	Acute	0.80	2.19E-04
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	5.64E-04	Acute	0.80	7.05E-04
adult female, hands, forearms, feet & lower legs	D02b	6.11E-05	Acute	0.80	7.63E-05
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.59E-05	Acute	0.80	1.98E-05
adult consuming fruits	D03b	3.40E-06	Acute	0.80	4.25E-06
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	1.13E-06	Acute	0.80	1.42E-06

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	4.02E-09	Chronic	0.80	5.02E-09
adult consuming fruits	D05b	8.61E-10	Chronic	0.80	1.08E-09
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	2.16E-15	Chronic	0.80	2.70E-15
adult	D06b	7.41E-16	Chronic	0.80	9.26E-16
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	8.41E-15	Chronic	0.80	1.05E-14
adult recreational fishermen	D07b	1.80E-15	Chronic	0.80	2.25E-15
children of subsistence populations	D07c	7.36E-14	Chronic	0.80	9.20E-14
adults of subsistence populations	D07d	1.58E-14	Chronic	0.80	1.97E-14

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	4.70E-01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	4.70E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	1.03E+01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	9.31E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	3.09E-02	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	1.408	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	8.69E-03	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	3.09E-02	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	1.408	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	5.22E-01	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.10E-03	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	4.09E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	9.46E+00	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	5.53E-04	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.10E-03	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	4.09E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.33E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	1.36E-03	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.10E-03	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	4.09E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	8.93E+01	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	2.44E-02	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.10E-03	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	4.09E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.408	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.33E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	1.49E-03	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	4.10.E-03	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	9.37E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.317	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1317	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.23E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	9.76E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	6.10E-03	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	4.10.E-03	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	9.37E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.317	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1317	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.23E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	4.51E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	6.61E-04	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	8.22E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.86E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	8.22E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	3.99E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	1.408	mg/mL	See Section 2
	Central (Units Converted)	1408	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.33E-04	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.33E-05	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.30E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	4.63E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	4.63E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.05E-06	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	24	days	GLEAMS
K	Decay coefficient (K)	2.89E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.30E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	4.63E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	4.63E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.25E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	7.19E-10	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	2.46E-10	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	4,200	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	3.02E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	1.61E-08	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	4,200	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	3.02E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	3.45E-09	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	4,200	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	3.02E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	1.41E-07	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	4,200	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.19E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	3.02E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	3.02E-08	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	4.70E-03	Chronic	0.80	5.87E-03
boom spray (hydraulic ground spray) application	C01b	9.31E-03	Chronic	0.80	1.16E-02
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	8.69E-03	Acute	0.80	1.09E-02
wearing contaminated gloves for 1 hour	C02b	5.22E-01	Acute	0.80	6.52E-01
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	5.53E-04	Acute	0.80	6.91E-04
accidental spill to lower legs	C03b	1.36E-03	Acute	0.80	1.70E-03

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)
		Application Rate #1			Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	2.44E-02	Acute	0.80	3.04E-02
adult female, lower legs	D01b	1.49E-03	Acute	0.80	1.86E-03
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	6.10E-03	Acute	0.80	7.62E-03
adult female, hands, forearms, feet & lower legs	D02b	6.61E-04	Acute	0.80	8.26E-04
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.86E-04	Acute	0.80	2.33E-04
adult consuming fruits	D03b	3.99E-05	Acute	0.80	4.99E-05
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	1.33E-05	Acute	0.80	1.67E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	1.05E-06	Chronic	0.80	1.31E-06
adult consuming fruits	D05b	2.25E-07	Chronic	0.80	2.81E-07
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	7.19E-10	Chronic	0.80	8.98E-10
adult	D06b	2.46E-10	Chronic	0.80	3.08E-10
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	1.61E-08	Chronic	0.80	2.01E-08
adult recreational fishermen	D07b	3.45E-09	Chronic	0.80	4.31E-09
children of subsistence populations	D07c	1.41E-07	Chronic	0.80	1.76E-07
adults of subsistence populations	D07d	3.02E-08	Chronic	0.80	3.77E-08

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	8.03	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	3.21E+01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	3.21E-01	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	2.43E-08	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	9.62	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	9.62	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	4.67E-08	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	2.43E-08	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	9.62	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	9.62	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	2.80E-06	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.61E-05	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	5.61E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	9.62	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	6.47E+01	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	5.18E-05	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.61E-05	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	5.61E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	9.62	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.59E+02	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	1.28E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	9.623	mg/mL	See Section 2
	Central (Units Converted)	9,623	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	9.11E-04	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	9.11E-05	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	4.48E-02	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	1.54E-02	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.44E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	2.90E-08	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.44E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	6.21E-09	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.44E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	2.54E-07	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.448	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.44E-05	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	5.44E-08	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	3.21E-01	Chronic	2.00	1.61E-01
boom spray (hydraulic ground spray) application	C01b	6.36E-01	Chronic	2.00	3.18E-01
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	4.67E-08	Acute	2.00	2.34E-08
wearing contaminated gloves for 1 hour	C02b	2.80E-06	Acute	2.00	1.40E-06
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	5.18E-05	Acute	2.00	2.59E-05
accidental spill to lower legs	C03b	1.28E-04	Acute	2.00	6.38E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	2.28E-03	Acute	2.00	1.14E-03
adult female, lower legs	D01b	1.40E-04	Acute	2.00	6.98E-05
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	8.76E-03	Acute	2.00	4.38E-03
adult female, hands, forearms, feet & lower legs	D02b	9.49E-04	Acute	2.00	4.74E-04
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.27E-02	Acute	2.00	6.37E-03
adult consuming fruits	D03b	2.73E-03	Acute	2.00	1.37E-03
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	9.11E-05	Acute	2.00	4.55E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	3.22E-05	Chronic	2.00	1.61E-05
adult consuming fruits	D05b	6.90E-06	Chronic	2.00	3.45E-06
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	4.48E-02	Chronic	2.00	2.24E-02
adult	D06b	1.54E-02	Chronic	2.00	7.68E-03
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	2.90E-08	Chronic	2.00	1.45E-08
adult recreational fishermen	D07b	6.21E-09	Chronic	2.00	3.11E-09
children of subsistence populations	D07c	2.54E-07	Chronic	2.00	1.27E-07
adults of subsistence populations	D07d	5.44E-08	Chronic	2.00	2.72E-08

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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HUMAN HEALTH SUMMARY TABLES

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	1.21E+01		
AHD B 2	Application Rate #2	7.57E-01	lb/day	ATD (acres/day) × R (lb/acre)
AHD B 3	Application Rate #3	1.51E+00		
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	1.21E-01		
Dose 2	Application Rate #2	7.57E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 3	Application Rate #3	1.51E-02		

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	2.66E+02		
AHD S 2	Application Rate #2	1.67E+01	lb/day	ATD (acres/day) × R (lb/acre)
AHD S 3	Application Rate #3	3.33E+01		
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	2.40E-01		
Dose 2	Application Rate #2	1.50E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 3	Application Rate #3	3.00E-02		

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	2.43E-08	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	121		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.1		
	Application Rate #1 (Units Converted)	120.9		
	Application Rate #2 (Units Converted)	7.56	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #3 (Units Converted)	15.11		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	5.87E-07		
Dose 2	Application Rate #2	3.67E-08	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 3	Application Rate #3	7.34E-08		

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	2.43E-08	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	121		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.1		
	Application Rate #1 (Units Converted)	120.9		
	Application Rate #2 (Units Converted)	7.56	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #3 (Units Converted)	15.11		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	3.52E-05		
Dose 2	Application Rate #2	2.20E-06	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 3	Application Rate #3	4.40E-06		

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.61E-05	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	5.61E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	121		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.1		
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	8.12E+02		
Amt H 2	Application Rate #2	5.08E+01	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Amt H 3	Application Rate #3	1.02E+02		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	6.51E-04		
Dose 2	Application Rate #2	4.07E-05	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)
Dose 3	Application Rate #3	8.14E-05		

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.61E-05	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	5.61E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	121		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.1		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.00E+03		
Amt LL 2	Application Rate #2	1.25E+02	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 3	Application Rate #3	2.50E+02		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	1.60E-03		
Dose 2	Application Rate #2	1.00E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)
Dose 3	Application Rate #3	2.01E-04		

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.61E-05	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	5.61E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	121		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.1		
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	7.67E+03		
Amt C 2	Application Rate #2	4.79E+02	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Amt C 3	Application Rate #3	9.59E+02		
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	2.87E-02		
Dose 2	Application Rate #2	1.79E-03	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 3	Application Rate #3	3.58E-03		

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.61E-05	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	5.61E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	121		
C F 2	Application Rate #2	7.56	mg/mL	See Section 2
C F 3	Application Rate #3	15.1		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.00E+03		
Amt LL 2	Application Rate #2	1.25E+02	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 3	Application Rate #3	2.50E+02		
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	1.75E-03		
Dose 2	Application Rate #2	1.10E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)
Dose 3	Application Rate #3	2.19E-04		

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	5.61.E-05	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	1.35E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
	Application Rate #1 (Units Converted)	33.937		
	Application Rate #2 (Units Converted)	2.121	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #3 (Units Converted)	4.242		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	3.3937		
DR 2	Application Rate #2	0.2121	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 3	Application Rate #3	0.4242		
Transfer Rate (TR)				
TR 1	Application Rate #1	4.25E-03		
TR 2	Application Rate #2	2.07E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 3	Application Rate #3	4.41E-04		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	3.37E+01		
AmtSS 2	Application Rate #2	1.64E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
AmtSS 3	Application Rate #3	3.49E+00		
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	3.02E-03		
Dose 2	Application Rate #2	1.47E-04	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 3	Application Rate #3	3.13E-04		

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	5.61.E-05	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	1.35E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
	Application Rate #1 (Units Converted)	33.937		
	Application Rate #2 (Units Converted)	2.121	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #3 (Units Converted)	4.242		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	3.3937		
DR 2	Application Rate #2	0.2121	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 3	Application Rate #3	0.4242		
Transfer Rate (TR)				
TR 1	Application Rate #1	4.25E-03		
TR 2	Application Rate #2	2.07E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 3	Application Rate #3	4.41E-04		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	1.56E+01		
AmtSS 2	Application Rate #2	7.59E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
AmtSS 3	Application Rate #3	1.61E+00		
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	3.27E-04		
Dose 2	Application Rate #2	1.59E-05	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)
Dose 3	Application Rate #3	3.39E-05		

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	2.12E+01		
C Fr 2	Application Rate #2	1.32E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 3	Application Rate #3	2.65E+00		
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	4.80E-03		
Dose 2	Application Rate #2	3.00E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 3	Application Rate #3	6.00E-04		

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 ± 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	2.12E+01		
C Fr 2	Application Rate #2	1.32E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 3	Application Rate #3	2.65E+00		
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	1.03E-03		
Dose 2	Application Rate #2	6.43E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 3	Application Rate #3	1.29E-04		

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	121		
C F 2	Lower	7.56	mg/mL	See Section 2
C F 3	Upper	15.1		
	Central (Units Converted)	120,894		
	Lower (Units Converted)	7,556	mg/L	1000 mg/L per mg/mL
	Upper (Units Converted)	15,112		
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.14E-02		
C W 2	Application Rate #2	7.15E-04	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 3	Application Rate #3	1.43E-03		
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.14E-03		
Dose 2	Application Rate #2	7.15E-05	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 3	Application Rate #3	1.43E-04		

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	3.35E-01		
C 0 2	Application Rate #2	2.09E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 3	Application Rate #3	4.19E-02		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.36E-02		
TWA C rFr 2	Application Rate #2	3.35E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day)\,\times\,T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 3	Application Rate #3	6.70E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.36E-02		
TWA C cFr 2	Application Rate #2	3.35E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 3	Application Rate #3	6.70E-03		
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.21E-05		
Dose 2	Application Rate #2	7.59E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 3	Application Rate #3	1.52E-06		

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	3.03		
R 2	Application Rate #2	0.189	lb/acre	Texas, 2004
R 3	Application Rate #3	0.378		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	3.35E-01		
C 0 2	Application Rate #2	2.09E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 3	Application Rate #3	4.19E-02		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.36E-02		
TWA C rFr 2	Application Rate #2	3.35E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day)\,\times\,T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 3	Application Rate #3	6.70E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.36E-02		
TWA C cFr 2	Application Rate #2	3.35E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 3	Application Rate #3	6.70E-03		
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.60E-06		
Dose 2	Application Rate #2	1.63E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 3	Application Rate #3	3.25E-07		

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	3.51E-07	mg/L	See Section 2
C W 2	Application Rate #2	1.26E-08		
C W 3	Application Rate #3	9.16E-09		
Estimated acute dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	3.51E-08	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	1.26E-09		
Dose 3	Application Rate #3	9.16E-10		

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	1.20E-08		
Dose 2	Application Rate #2	4.33E-10	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)
Dose 3	Application Rate #3	3.14E-10		

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.26E-11		
C F 2	Application Rate #2	1.53E-12	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	1.11E-12		
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	2.27E-14		
Dose 2	Application Rate #2	8.18E-16	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)
Dose 3	Application Rate #3	5.93E-16		

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.26E-11		
C F 2	Application Rate #2	1.53E-12	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	1.11E-12		
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	4.87E-15		
Dose 2	Application Rate #2	1.75E-16	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)
Dose 3	Application Rate #3	1.27E-16		

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.26E-11		
C F 2	Application Rate #2	1.53E-12	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	1.11E-12		
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	1.99E-13		
Dose 2	Application Rate #2	7.16E-15	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)
Dose 3	Application Rate #3	5.19E-15		

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.000121	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.26E-11		
C F 2	Application Rate #2	1.53E-12	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	1.11E-12		
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	4.26E-14		
Dose 2	Application Rate #2	1.53E-15	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)
Dose 3	Application Rate #3	1.11E-15		

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3			Application Rate #1	Application Rate #2	Application Rate #3
Accidental / Incidental Exposures - Chronic									
General Exposures - Direct Spray									
direct foliar (backpack) application	C01a	1.21E-01	7.57E-03	1.51E-02	Chronic	2.0	6.05E-02	3.78E-03	7.57E-03
boom spray (hydraulic ground spray) application	C01b	2.40E-01	1.50E-02	3.00E-02	Chronic	2.0	1.20E-01	7.49E-03	1.50E-02
Accidental / Incidental Exposures - Acute									
Dermal Exposures - Wearing Contaminated Gloves									
wearing contaminated gloves for 1 minute	C02a	5.87E-07	3.67E-08	7.34E-08	Acute	2.0	2.93E-07	1.83E-08	3.67E-08
wearing contaminated gloves for 1 hour	C02b	3.52E-05	2.20E-06	4.40E-06	Acute	2.0	1.76E-05	1.10E-06	2.20E-06
Dermal Exposures - Accidental Spill									
accidental spill to hands	C03a	6.51E-04	4.07E-05	8.14E-05	Acute	2.0	3.25E-04	2.03E-05	4.07E-05
accidental spill to lower legs	C03b	1.60E-03	1.00E-04	2.01E-04	Acute	2.0	8.02E-04	5.01E-05	1.00E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3			Application Rate #1	Application Rate #2	Application Rate #3
Acute / Accidental Exposures									
General Exposures - Direct Spray									
children, total body	D01a	2.87E-02	1.79E-03	3.58E-03	Acute	2.00	1.43E-02	8.96E-04	1.79E-03
adult female, lower legs	D01b	1.75E-03	1.10E-04	2.19E-04	Acute	2.00	8.77E-04	5.48E-05	1.10E-04
Dermal Exposures - Contact with Contaminated Vegetation									
children, total body	D02a	3.02E-03	1.47E-04	3.13E-04	Acute	2.00	1.51E-03	7.36E-05	1.57E-04
adult female, hands, forearms, feet & lower legs	D02b	3.27E-04	1.59E-05	3.39E-05	Acute	2.00	1.64E-04	7.97E-06	1.70E-05
Ingestion Exposures - Consumption of Contaminated Vegetation									
children consuming fruits	D03a	4.80E-03	3.00E-04	6.00E-04	Acute	2.00	2.40E-03	1.50E-04	3.00E-04
adult consuming fruits	D03b	1.03E-03	6.43E-05	1.29E-04	Acute	2.00	5.15E-04	3.22E-05	6.43E-05
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill									
children	D04	1.14E-03	7.15E-05	1.43E-04	Acute	2.00	5.72E-04	3.58E-05	7.15E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3			Application Rate #1	Application Rate #2	Application Rate #3
Chronic / Longer Term Exposures									
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application									
children consuming fruits	D05a	1.21E-05	7.59E-07	1.52E-06	Chronic	2.00	6.07E-06	3.79E-07	7.59E-07
adult consuming fruits	D05b	2.60E-06	1.63E-07	3.25E-07	Chronic	2.00	1.30E-06	8.13E-08	1.63E-07
Ingestion Exposures - Consumption of Contaminated Water									
children	D06a	3.51E-08	1.26E-09	9.16E-10	Chronic	2.00	1.76E-08	6.32E-10	4.58E-10
adult	D06b	1.20E-08	4.33E-10	3.14E-10	Chronic	2.00	6.02E-09	2.17E-10	1.57E-10
Ingestion Exposures - Consumption of Contaminated Fish									
child recreational fishermen	D07a	2.27E-14	8.18E-16	5.93E-16	Chronic	2.00	1.14E-14	4.09E-16	2.96E-16
adult recreational fishermen	D07b	4.87E-15	1.75E-16	1.27E-16	Chronic	2.00	2.43E-15	8.77E-17	6.35E-17
children of subsistence populations	D07c	1.99E-13	7.16E-15	5.19E-15	Chronic	2.00	9.94E-14	3.58E-15	2.59E-15
adults of subsistence populations	D07d	4.26E-14	1.53E-15	1.11E-15	Chronic	2.00	2.13E-14	7.67E-16	5.56E-16

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	1.21E+01		
AHD B 2	Application Rate #2	7.53E-01	lb/day	ATD (acres/day) × R (lb/acre)
AHD B 3	Application Rate #3	1.51E+00		
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	1.21E-01		
Dose 2	Application Rate #2	7.53E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 3	Application Rate #3	1.51E-02		

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	2.65E+02		
AHD S 2	Application Rate #2	1.66E+01	lb/day	ATD (acres/day) × R (lb/acre)
AHD S 3	Application Rate #3	3.31E+01		
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	2.39E-01		
Dose 2	Application Rate #2	1.49E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 3	Application Rate #3	2.98E-02		

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.15E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	120		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.04		
	Application Rate #1 (Units Converted)	120		
	Application Rate #2 (Units Converted)	7.51	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #3 (Units Converted)	15.04		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	2.76E-05	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.72E-06		
Dose 3	Application Rate #3	3.45E-06		

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.15E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	120		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.0		
	Application Rate #1 (Units Converted)	120		
	Application Rate #2 (Units Converted)	7.51	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #3 (Units Converted)	15.04		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	1.66E-03		
Dose 2	Application Rate #2	1.03E-04	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 3	Application Rate #3	2.07E-04		

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.35E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	4.35E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	120		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.0		
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	8.09E+02		
Amt H 2	Application Rate #2	5.05E+01	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Amt H 3	Application Rate #3	1.01E+02		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	5.03E-03		
Dose 2	Application Rate #2	3.14E-04	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)
Dose 3	Application Rate #3	6.28E-04		

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.35E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	4.35E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	120		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.0		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.99E+03		
Amt LL 2	Application Rate #2	1.24E+02	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 3	Application Rate #3	2.49E+02		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	1.24E-02		
Dose 2	Application Rate #2	7.73E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)
Dose 3	Application Rate #3	1.55E-03		

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.35E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	4.35E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	120		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.0		
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	7.64E+03		
Amt C 2	Application Rate #2	4.77E+02	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Amt C 3	Application Rate #3	9.54E+02		
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	2.22E-01		
Dose 2	Application Rate #2	1.38E-02	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 3	Application Rate #3	2.77E-02		

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	4.35E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	4.35E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	120		
C F 2	Application Rate #2	7.51	mg/mL	See Section 2
C F 3	Application Rate #3	15.0		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.99E+03		
Amt LL 2	Application Rate #2	1.24E+02	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 3	Application Rate #3	2.49E+02		
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	1.36E-02		
Dose 2	Application Rate #2	8.45E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)
Dose 3	Application Rate #3	1.69E-03		

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	4.35.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	1.04E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
	Application Rate #1 (Units Converted)	33.8		
	Application Rate #2 (Units Converted)	2.11	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #3 (Units Converted)	4.22		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	3.3807		
DR 2	Application Rate #2	0.2109	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 3	Application Rate #3	0.4222		
Transfer Rate (TR)				
TR 1	Application Rate #1	4.23E-03		
TR 2	Application Rate #2	2.06E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 3	Application Rate #3	4.38E-04		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	3.36E+01		
AmtSS 2	Application Rate #2	1.63E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
AmtSS 3	Application Rate #3	3.48E+00		
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	2.32E-02		
Dose 2	Application Rate #2	1.13E-03	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 3	Application Rate #3	2.41E-03		

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	4.35.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	1.04E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
	Application Rate #1 (Units Converted)	33.8		
	Application Rate #2 (Units Converted)	2.11	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #3 (Units Converted)	4.22		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	3.3807		
DR 2	Application Rate #2	0.2109	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 3	Application Rate #3	0.4222		
Transfer Rate (TR)				
TR 1	Application Rate #1	4.23E-03		
TR 2	Application Rate #2	2.06E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 3	Application Rate #3	4.38E-04		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	1.55E+01		
AmtSS 2	Application Rate #2	7.54E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
AmtSS 3	Application Rate #3	1.61E+00		
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	2.52E-03		
Dose 2	Application Rate #2	1.22E-04	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)
Dose 3	Application Rate #3	2.61E-04		

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 ± 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	2.11E+01		
C Fr 2	Application Rate #2	1.32E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 3	Application Rate #3	2.64E+00		
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	4.78E-03		
Dose 2	Application Rate #2	2.99E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 3	Application Rate #3	5.98E-04		

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 ± 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	2.11E+01		
C Fr 2	Application Rate #2	1.32E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 3	Application Rate #3	2.64E+00		
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	1.03E-03		
Dose 2	Application Rate #2	6.40E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 3	Application Rate #3	1.28E-04		

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	120		
C F 2	Lower	7.51	mg/mL	See Section 2
C F 3	Upper	15.0		
	Central (Units Converted)	120,429		
	Lower (Units Converted)	7,513	mg/L	1000 mg/L per mg/mL
	Upper (Units Converted)	15,039		
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.14E-02		
C W 2	Application Rate #2	7.11E-04	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 3	Application Rate #3	1.42E-03		
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.14E-03		
Dose 2	Application Rate #2	7.11E-05	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 3	Application Rate #3	1.42E-04		

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	3.34E-01		
C 0 2	Application Rate #2	2.08E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 3	Application Rate #3	4.17E-02		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.34E-02		
TWA C rFr 2	Application Rate #2	3.33E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day)\,\times\,T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 3	Application Rate #3	6.66E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.34E-02		
TWA C cFr 2	Application Rate #2	3.33E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 3	Application Rate #3	6.66E-03		
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.21E-05		
Dose 2	Application Rate #2	7.55E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 3	Application Rate #3	1.51E-06		

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 ± 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2003
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	3.016		
R 2	Application Rate #2	0.188	lb/acre	Texas, 2004
R 3	Application Rate #3	0.377		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	3.34E-01		
C 0 2	Application Rate #2	2.08E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 3	Application Rate #3	4.17E-02		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.34E-02		
TWA C rFr 2	Application Rate #2	3.33E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day)\,\times\,T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 3	Application Rate #3	6.66E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.34E-02		
TWA C cFr 2	Application Rate #2	3.33E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 3	Application Rate #3	6.66E-03		
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.59E-06		
Dose 2	Application Rate #2	1.62E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 3	Application Rate #3	3.24E-07		

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Estimated acute dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	3.51E-08		
Dose 2	Application Rate #2	1.26E-09	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 3	Application Rate #3	9.16E-10		

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	1.20E-08		
Dose 2	Application Rate #2	4.33E-10	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)
Dose 3	Application Rate #3	3.14E-10		

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00309	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.09E-09		
C F 2	Application Rate #2	3.91E-11	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	2.83E-11		
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	5.79E-13		
Dose 2	Application Rate #2	2.08E-14	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)
Dose 3	Application Rate #3	1.51E-14		

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00309	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.09E-09		
C F 2	Application Rate #2	3.91E-11	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	2.83E-11		
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	1.24E-13		
Dose 2	Application Rate #2	4.47E-15	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)
Dose 3	Application Rate #3	3.24E-15		

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00309	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.09E-09		
C F 2	Application Rate #2	3.91E-11	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	2.83E-11		
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	5.06E-12		
Dose 2	Application Rate #2	1.82E-13	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)
Dose 3	Application Rate #3	1.32E-13		

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.00309	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	3.51E-07		
C W 2	Application Rate #2	1.26E-08	mg/L	See Section 2
C W 3	Application Rate #3	9.16E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.09E-09		
C F 2	Application Rate #2	3.91E-11	mg/kg	C W (mg/L) × BCF (L/kg)
C F 3	Application Rate #3	2.83E-11		
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	1.09E-12		
Dose 2	Application Rate #2	3.91E-14	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)
Dose 3	Application Rate #3	2.83E-14		

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3			Application Rate #1	Application Rate #2	Application Rate #3
Accidental / Incidental Exposures - Chronic									
General Exposures - Direct Spray									
direct foliar (backpack) application	C01a	1.21E-01	7.53E-03	1.51E-02	Chronic	2.0	6.03E-02	3.76E-03	7.53E-03
boom spray (hydraulic ground spray) application	C01b	2.39E-01	1.49E-02	2.98E-02	Chronic	2.0	1.19E-01	7.45E-03	1.49E-02
Accidental / Incidental Exposures - Acute									
Dermal Exposures - Wearing Contaminated Gloves									
wearing contaminated gloves for 1 minute	C02a	2.76E-05	1.72E-06	3.45E-06	Acute	2.0	1.38E-05	8.62E-07	1.73E-06
wearing contaminated gloves for 1 hour	C02b	1.66E-03	1.03E-04	2.07E-04	Acute	2.0	8.29E-04	5.17E-05	1.04E-04
Dermal Exposures - Accidental Spill									
accidental spill to hands	C03a	5.03E-03	3.14E-04	6.28E-04	Acute	2.0	2.51E-03	1.57E-04	3.14E-04
accidental spill to lower legs	C03b	1.24E-02	7.73E-04	1.55E-03	Acute	2.0	6.20E-03	3.86E-04	7.74E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3			Application Rate #1	Application Rate #2	Application Rate #3
Acute / Accidental Exposures									
General Exposures - Direct Spray									
children, total body	D01a	2.22E-01	1.38E-02	2.77E-02	Acute	2.00	1.11E-01	6.91E-03	1.38E-02
adult female, lower legs	D01b	1.36E-02	8.45E-04	1.69E-03	Acute	2.00	6.78E-03	4.23E-04	8.46E-04
Dermal Exposures - Contact with Contaminated Vegetation									
children, total body	D02a	2.32E-02	1.13E-03	2.41E-03	Acute	2.00	1.16E-02	5.65E-04	1.20E-03
adult female, hands, forearms, feet & lower legs	D02b	2.52E-03	1.22E-04	2.61E-04	Acute	2.00	1.26E-03	6.12E-05	1.30E-04
Ingestion Exposures - Consumption of Contaminated Vegetation									
children consuming fruits	D03a	4.78E-03	2.99E-04	5.98E-04	Acute	2.00	2.39E-03	1.49E-04	2.99E-04
adult consuming fruits	D03b	1.03E-03	6.40E-05	1.28E-04	Acute	2.00	5.13E-04	3.20E-05	6.40E-05
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill									
children	D04	1.14E-03	7.11E-05	1.42E-04	Acute	2.00	5.70E-04	3.55E-05	7.12E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)			Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)		
		Application Rate #1	Application Rate #2	Application Rate #3			Application Rate #1	Application Rate #2	Application Rate #3
Chronic / Longer Term Exposures									
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application									
children consuming fruits	D05a	1.21E-05	7.55E-07	1.51E-06	Chronic	2.00	6.05E-06	3.77E-07	7.55E-07
adult consuming fruits	D05b	2.59E-06	1.62E-07	3.24E-07	Chronic	2.00	1.30E-06	8.08E-08	1.62E-07
Ingestion Exposures - Consumption of Contaminated Water									
children	D06a	3.51E-08	1.26E-09	9.16E-10	Chronic	2.00	1.76E-08	6.32E-10	4.58E-10
adult	D06b	1.20E-08	4.33E-10	3.14E-10	Chronic	2.00	6.02E-09	2.17E-10	1.57E-10
Ingestion Exposures - Consumption of Contaminated Fish									
child recreational fishermen	D07a	5.79E-13	2.08E-14	1.51E-14	Chronic	2.00	2.89E-13	1.04E-14	7.55E-15
adult recreational fishermen	D07b	1.24E-13	4.47E-15	3.24E-15	Chronic	2.00	6.20E-14	2.23E-15	1.62E-15
children of subsistence populations	D07c	5.06E-12	1.82E-13	1.32E-13	Chronic	2.00	2.53E-12	9.12E-14	6.61E-14
adults of subsistence populations	D07d	1.09E-12	3.91E-14	2.83E-14	Chronic	2.00	5.43E-13	1.95E-14	1.42E-14

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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HUMAN HEALTH SUMMARY TABLES

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	3.96E+00	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	3.96E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	8.72E+01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	7.84E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	2.96E-05	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	23.73	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	1.41E-04	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	2.96E-05	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	23.73	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	8.44E-03	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.25E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	5.24E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	1.59E+02	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	1.19E-03	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.25E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	5.24E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	3.93E+02	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	2.94E-03	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.25E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	5.24E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	1.51E+03	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	5.26E-02	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	5.25E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	5.24E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	23.73	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	3.93E+02	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	3.22E-03	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	5.25.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	1.25E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	11.102	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	1.1102	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.26E-03	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	9.97E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	8.32E-03	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	5.25.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	1.25E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	11.102	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	1.1102	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.26E-03	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	4.61E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	9.01E-04	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	6.93E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.57E-03	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	6.93E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	3.37E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	23.73	mg/mL	See Section 2
	Central (Units Converted)	23,729	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.25E-03	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	2.25E-04	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.10E-01	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	4.15E-02	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	4.15E-02	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	9.41E-06	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	26	days	USDA, 2004
K	Decay coefficient (K)	2.67E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.990	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.10E-01	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	4.15E-02	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	4.15E-02	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.02E-06	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	2.91E-08	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	9.99E-09	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.70	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.04E-07	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	1.09E-10	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.70	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.04E-07	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	2.34E-11	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.70	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.04E-07	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	9.54E-10	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.70	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	2.91E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	2.04E-07	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	2.04E-10	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	3.96E-02	Chronic	2.50	1.58E-02
boom spray (hydraulic ground spray) application	C01b	7.84E-02	Chronic	2.50	3.14E-02
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	1.41E-04	Acute	2.50	5.63E-05
wearing contaminated gloves for 1 hour	C02b	8.44E-03	Acute	2.50	3.38E-03
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	1.19E-03	Acute	2.50	4.78E-04
accidental spill to lower legs	C03b	2.94E-03	Acute	2.50	1.18E-03

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	5.26E-02	Acute	2.50	2.11E-02
adult female, lower legs	D01b	3.22E-03	Acute	2.50	1.29E-03
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	8.32E-03	Acute	2.50	3.33E-03
adult female, hands, forearms, feet & lower legs	D02b	9.01E-04	Acute	2.50	3.60E-04
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.57E-03	Acute	2.50	6.29E-04
adult consuming fruits	D03b	3.37E-04	Acute	2.50	1.35E-04
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	2.25E-04	Acute	2.50	8.98E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	9.41E-06	Chronic	2.50	3.76E-06
adult consuming fruits	D05b	2.02E-06	Chronic	2.50	8.06E-07
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	2.91E-08	Chronic	2.50	1.17E-08
adult	D06b	9.99E-09	Chronic	2.50	3.99E-09
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	1.09E-10	Chronic	2.50	4.36E-11
adult recreational fishermen	D07b	2.34E-11	Chronic	2.50	9.34E-12
children of subsistence populations	D07c	9.54E-10	Chronic	2.50	3.81E-10
adults of subsistence populations	D07d	2.04E-10	Chronic	2.50	8.17E-11

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	2.02E-03	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	6.93E-04	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8,913	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.80E+02	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	9.60E-02	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8,913	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.80E+02	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	2.06E-02	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8,913	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.80E+02	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	8.40E-01	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8,913	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	0.0202	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.80E+02	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	1.80E-01	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	2.02E-03	Chronic	0.40	5.05E-03
adult	D06b	6.93E-04	Chronic	0.40	1.73E-03
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	9.60E-02	Chronic	0.40	2.40E-01
adult recreational fishermen	D07b	2.06E-02	Chronic	0.40	5.14E-02
children of subsistence populations	D07c	8.40E-01	Chronic	0.40	2.10E+00
adults of subsistence populations	D07d	1.80E-01	Chronic	0.40	4.50E-01

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	4.70E-01	lb/day	ATD (acres/day) × R (lb/acre)
AHD B 2	Application Rate #2	1.57E-01		
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	4.70E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	1.57E-03		

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	1.03E+01	lb/day	ATD (acres/day) × R (lb/acre)
AHD S 2	Application Rate #2	3.44E+00		
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	9.30E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	3.10E-03		

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	8.75E-07	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
	Application Rate #1 (Units Converted)	1.406	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	0.469		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	2.46E-07	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	8.21E-08		

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	8.75E-07	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
	Application Rate #1 (Units Converted)	1.406	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	0.469		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	1.48E-05	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	4.92E-06		

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	9.02E-05	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	9.02E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	9.45E+00	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Amt H 2	Application Rate #2	3.15E+00		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	1.22E-05	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	4.06E-06		

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	9.02E-05	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	9.02E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.33E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	7.76E+00		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	3.00E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.00E-05		

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	9.02E-05	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	9.02E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	8.92E+01	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Amt C 2	Application Rate #2	2.97E+01		
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	5.36E-04	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	1.79E-04		

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	9.02E-05	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	9.02E-05	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	1.406	mg/mL	See Section 2
C F 2	Application Rate #2	0.469		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	2.33E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	7.76E+00		
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	3.28E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)
Dose 2	Application Rate #2	1.09E-05		

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	9.02.E-05	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	2.16E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
	Application Rate #1 (Units Converted)	1.316	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	0.439		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1316	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.0439		
Transfer Rate (TR)				
TR 1	Application Rate #1	1.23E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	3.71E-05		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	9.75E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
AmtSS 2	Application Rate #2	2.95E-01		
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	1.41E-04	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	4.25E-05		

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	9.02.E-05	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	2.16E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
	Application Rate #1 (Units Converted)	1.316	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	0.439		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1316	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.0439		
Transfer Rate (TR)				
TR 1	Application Rate #1	1.23E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	3.71E-05		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	4.51E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
AmtSS 2	Application Rate #2	1.36E-01		
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	1.52E-05	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)
Dose 2	Application Rate #2	4.60E-06		

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	8.22E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	2.74E-01		
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.86E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	6.21E-05		

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	8.22E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	2.74E-01		
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	3.99E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	1.33E-05		

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	1.406	mg/mL	See Section 2
C F 2	Lower	0.469		
	Central (Units Converted)	1,406	mg/L	1000 mg/L per mg/mL
	Lower (Units Converted)	469		
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.33E-04	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	4.44E-05		
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.33E-05	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	4.44E-06		

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.30E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	4.33E-03		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.46E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day) \times T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	1.82E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.46E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	1.82E-03		
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.24E-06	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	4.13E-07		

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	30	days	USDA, 2004
K	Decay coefficient (K)	2.31E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.117	lb/acre	Texas, 2004
R 2	Application Rate #2	0.0391		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.30E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	4.33E-03		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	5.46E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day)\,\times\,T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	1.82E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	5.46E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	1.82E-03		
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.65E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	8.84E-08		

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Estimated acute dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	5.68E-09	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	1.87E-09		

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	1.95E-09	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)
Dose 2	Application Rate #2	6.40E-10		

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.0301	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.71E-09	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	5.61E-10		
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	9.11E-13	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)
Dose 2	Application Rate #2	2.99E-13		

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.0301	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.71E-09	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	5.61E-10		
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	1.95E-13	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)
Dose 2	Application Rate #2	6.42E-14		

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.0301	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.71E-09	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	5.61E-10		
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	7.97E-12	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)
Dose 2	Application Rate #2	2.62E-12		

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.0301	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	5.68E-08	mg/L	See Section 2
C W 2	Application Rate #2	1.87E-08		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.71E-09	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	5.61E-10		
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	1.71E-12	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)
Dose 2	Application Rate #2	5.61E-13		

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Accidental / Incidental Exposures - Chronic							
General Exposures - Direct Spray							
direct foliar (backpack) application	C01a	4.70E-03	1.57E-03	Chronic	0.25	1.88E-02	6.26E-03
boom spray (hydraulic ground spray) application	C01b	9.30E-03	3.10E-03	Chronic	0.25	3.72E-02	1.24E-02
Accidental / Incidental Exposures - Acute							
Dermal Exposures - Wearing Contaminated Gloves							
wearing contaminated gloves for 1 minute	C02a	2.46E-07	8.21E-08	Acute	0.25	9.85E-07	3.28E-07
wearing contaminated gloves for 1 hour	C02b	1.48E-05	4.92E-06	Acute	0.25	5.91E-05	1.97E-05
Dermal Exposures - Accidental Spill							
accidental spill to hands	C03a	1.22E-05	4.06E-06	Acute	0.25	4.87E-05	1.62E-05
accidental spill to lower legs	C03b	3.00E-05	1.00E-05	Acute	0.25	1.20E-04	4.00E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Acute / Accidental Exposures							
General Exposures - Direct Spray							
children, total body	D01a	5.36E-04	1.79E-04	Acute	0.25	2.15E-03	7.15E-04
adult female, lower legs	D01b	3.28E-05	1.09E-05	Acute	0.25	1.31E-04	4.38E-05
Dermal Exposures - Contact with Contaminated Vegetation							
children, total body	D02a	1.41E-04	4.25E-05	Acute	0.25	5.62E-04	1.70E-04
adult female, hands, forearms, feet & lower legs	D02b	1.52E-05	4.60E-06	Acute	0.25	6.09E-05	1.84E-05
Ingestion Exposures - Consumption of Contaminated Vegetation							
children consuming fruits	D03a	1.86E-04	6.21E-05	Acute	0.25	7.45E-04	2.48E-04
adult consuming fruits	D03b	3.99E-05	1.33E-05	Acute	0.25	1.60E-04	5.32E-05
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill							
children	D04	1.33E-05	4.44E-06	Acute	0.25	5.32E-05	1.77E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Chronic / Longer Term Exposures							
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application							
children consuming fruits	D05a	1.24E-06	4.13E-07	Chronic	0.25	4.95E-06	1.65E-06
adult consuming fruits	D05b	2.65E-07	8.84E-08	Chronic	0.25	1.06E-06	3.54E-07
Ingestion Exposures - Consumption of Contaminated Water							
children	D06a	5.68E-09	1.87E-09	Chronic	0.25	2.27E-08	7.47E-09
adult	D06b	1.95E-09	6.40E-10	Chronic	0.25	7.79E-09	2.56E-09
Ingestion Exposures - Consumption of Contaminated Fish							
child recreational fishermen	D07a	9.11E-13	2.99E-13	Chronic	0.25	3.64E-12	1.20E-12
adult recreational fishermen	D07b	1.95E-13	6.42E-14	Chronic	0.25	7.81E-13	2.57E-13
children of subsistence populations	D07c	7.97E-12	2.62E-12	Chronic	0.25	3.19E-11	1.05E-11
adults of subsistence populations	D07d	1.71E-12	5.61E-13	Chronic	0.25	6.83E-12	2.25E-12

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	1.47E-01	lb/day	ATD (acres/day) × R (lb/acre)
AHD B 2	Application Rate #2	2.93E-01		
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	1.47E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	2.93E-03		

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	3.23E+00	lb/day	ATD (acres/day) × R (lb/acre)
AHD S 2	Application Rate #2	6.46E+00		
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	2.91E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	5.81E-03		

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	7.17E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.44	mg/mL	See Section 2
C F 2	Application Rate #2	0.88		
	Application Rate #1 (Units Converted)	0.44	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	0.88		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	6.30E-07	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.26E-06		

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	7.17E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.44	mg/mL	See Section 2
C F 2	Application Rate #2	0.88		
	Application Rate #1 (Units Converted)	0.44	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	0.88		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	3.78E-05	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	7.57E-05		

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.44	mg/mL	See Section 2
C F 2	Application Rate #2	0.88		
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	2.95E+00	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Amt H 2	Application Rate #2	5.91E+00		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	9.23E-06	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.85E-05		

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.44	mg/mL	See Section 2
C F 2	Application Rate #2	0.88		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	7.28E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	1.46E+01		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	2.28E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	4.55E-05		

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.44	mg/mL	See Section 2
C F 2	Application Rate #2	0.88		
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	2.79E+01	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Amt C 2	Application Rate #2	5.58E+01		
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	4.07E-04	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	8.14E-04		

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.44	mg/mL	See Section 2
C F 2	Application Rate #2	0.88		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	7.28E+00	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	1.46E+01		
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	2.49E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)
Dose 2	Application Rate #2	4.98E-05		

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	2.19.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	5.24E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
	Application Rate #1 (Units Converted)	0.411	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	0.822		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0411	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.0822		
Transfer Rate (TR)				
TR 1	Application Rate #1	3.46E-05	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	7.37E-05		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	2.75E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
AmtSS 2	Application Rate #2	5.84E-01		
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	9.59E-05	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)
Dose 2	Application Rate #2	2.04E-04		

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	2.19.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	5.24E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
	Application Rate #1 (Units Converted)	0.411	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
	Application Rate #2 (Units Converted)	0.822		
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0411	µg/cm2	R ($\mu g/cm^2$) × PropDr
DR 2	Application Rate #2	0.0822		
Transfer Rate (TR)				
TR 1	Application Rate #1	3.46E-05	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
TR 2	Application Rate #2	7.37E-05		
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	1.27E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
AmtSS 2	Application Rate #2	2.70E-01		
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	1.04E-05	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)
Dose 2	Application Rate #2	2.21E-05		

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	2.57E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	5.14E-01		
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	5.82E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	1.16E-04		

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	2.57E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
C Fr 2	Application Rate #2	5.14E-01		
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	1.25E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	2.49E-05		

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	0.439	mg/mL	See Section 2
C F 2	Lower	0.879		
	Central (Units Converted)	439	mg/L	1000 mg/L per mg/mL
	Lower (Units Converted)	879		
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	4.16E-05	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	8.32E-05		
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	4.16E-06	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	8.32E-06		

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	4.06E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	8.11E-03		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	6.49E-04	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day) \times T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	1.30E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	6.49E-04	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	1.30E-03		
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.47E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)
Dose 2	Application Rate #2	2.94E-07		

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.037	lb/acre	Texas, 2004
R 2	Application Rate #2	0.073		
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	4.06E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
C 0 2	Application Rate #2	8.11E-03		
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	6.49E-04	mg/kg	C 0 (mg/kg) × $(1-e^{-K\,(1/day) \times T\,(day)})$ / (K (1/day) × T (day))
TWA C rFr 2	Application Rate #2	1.30E-03		
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	6.49E-04	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
TWA C cFr 2	Application Rate #2	1.30E-03		
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	3.15E-08	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)
Dose 2	Application Rate #2	6.30E-08		

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Estimated acute dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	6.53E-11	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	1.31E-10		

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	2.24E-11	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)
Dose 2	Application Rate #2	4.48E-11		

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	3.44E-10		
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	9.17E-14	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)
Dose 2	Application Rate #2	1.83E-13		

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	3.44E-10		
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	1.96E-14	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)
Dose 2	Application Rate #2	3.93E-14		

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	3.44E-10		
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	8.02E-13	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)
Dose 2	Application Rate #2	1.60E-12		

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.53E-10	mg/L	See Section 2
C W 2	Application Rate #2	1.31E-09		
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	1.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
C F 2	Application Rate #2	3.44E-10		
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	1.72E-13	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)
Dose 2	Application Rate #2	3.44E-13		

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Accidental / Incidental Exposures - Chronic							
General Exposures - Direct Spray							
direct foliar (backpack) application	C01a	1.47E-03	2.93E-03	Chronic	0.24	6.11E-03	1.22E-02
boom spray (hydraulic ground spray) application	C01b	2.91E-03	5.81E-03	Chronic	0.24	1.21E-02	2.42E-02
Accidental / Incidental Exposures - Acute							
Dermal Exposures - Wearing Contaminated Gloves							
wearing contaminated gloves for 1 minute	C02a	6.30E-07	1.26E-06	Acute	0.24	2.63E-06	5.25E-06
wearing contaminated gloves for 1 hour	C02b	3.78E-05	7.57E-05	Acute	0.24	1.58E-04	3.15E-04
Dermal Exposures - Accidental Spill							
accidental spill to hands	C03a	9.23E-06	1.85E-05	Acute	0.24	3.85E-05	7.70E-05
accidental spill to lower legs	C03b	2.28E-05	4.55E-05	Acute	0.24	9.48E-05	1.90E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Acute / Accidental Exposures							
General Exposures - Direct Spray							
children, total body	D01a	4.07E-04	8.14E-04	Acute	0.24	1.70E-03	3.39E-03
adult female, lower legs	D01b	2.49E-05	4.98E-05	Acute	0.24	1.04E-04	2.07E-04
Dermal Exposures - Contact with Contaminated Vegetation							
children, total body	D02a	9.59E-05	2.04E-04	Acute	0.24	4.00E-04	8.51E-04
adult female, hands, forearms, feet & lower legs	D02b	1.04E-05	2.21E-05	Acute	0.24	4.33E-05	9.21E-05
Ingestion Exposures - Consumption of Contaminated Vegetation							
children consuming fruits	D03a	5.82E-05	1.16E-04	Acute	0.24	2.42E-04	4.85E-04
adult consuming fruits	D03b	1.25E-05	2.49E-05	Acute	0.24	5.20E-05	1.04E-04
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill							
children	D04	4.16E-06	8.32E-06	Acute	0.24	1.73E-05	3.47E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Chronic / Longer Term Exposures							
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application							
children consuming fruits	D05a	1.47E-07	2.94E-07	Chronic	0.24	6.13E-07	1.23E-06
adult consuming fruits	D05b	3.15E-08	6.30E-08	Chronic	0.24	1.31E-07	2.63E-07
Ingestion Exposures - Consumption of Contaminated Water							
children	D06a	6.53E-11	1.31E-10	Chronic	0.24	2.72E-10	5.44E-10
adult	D06b	2.24E-11	4.48E-11	Chronic	0.24	9.33E-11	1.87E-10
Ingestion Exposures - Consumption of Contaminated Fish							
child recreational fishermen	D07a	9.17E-14	1.83E-13	Chronic	0.24	3.82E-13	7.64E-13
adult recreational fishermen	D07b	1.96E-14	3.93E-14	Chronic	0.24	8.18E-14	1.64E-13
children of subsistence populations	D07c	8.02E-13	1.60E-12	Chronic	0.24	3.34E-12	6.68E-12
adults of subsistence populations	D07d	1.72E-13	3.44E-13	Chronic	0.24	7.16E-13	1.43E-12

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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HUMAN HEALTH SUMMARY TABLES

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	3.91E-01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	3.91E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	8.61E+00	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	7.75E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	7.17E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.781	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	1.12E-06	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	7.17E-06	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.781	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	6.73E-05	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	5.25E+00	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	1.64E-05	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.29E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	4.05E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	4.96E+01	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	7.23E-04	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.19E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	2.19E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.781	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.29E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	4.43E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	2.19.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	5.24E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.10	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1096	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.01E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	8.00E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	2.79E-04	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	2.19.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	5.24E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	1.10	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.1096	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	1.01E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	3.70E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	3.03E-05	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	6.85E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.55E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	6.85E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	3.33E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	0.781	mg/mL	See Section 2
	Central (Units Converted)	781	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.39E-05	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	7.39E-06	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.08E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.73E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.73E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	3.92E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	10	days	USDA, 2004
K	Decay coefficient (K)	6.93E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.0978	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	1.08E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.73E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.73E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	8.41E-08	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	1.79E-10	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	6.14E-11	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	2.52E-13	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	5.39E-14	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	2.20E-12	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	0.26	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.79E-09	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.72E-10	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	4.72E-13	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	3.91E-03	Chronic	0.24	1.63E-02
boom spray (hydraulic ground spray) application	C01b	7.75E-03	Chronic	0.24	3.23E-02
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	1.12E-06	Acute	0.24	4.67E-06
wearing contaminated gloves for 1 hour	C02b	6.73E-05	Acute	0.24	2.80E-04
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	1.64E-05	Acute	0.24	6.84E-05
accidental spill to lower legs	C03b	4.05E-05	Acute	0.24	1.69E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	7.23E-04	Acute	0.24	3.01E-03
adult female, lower legs	D01b	4.43E-05	Acute	0.24	1.84E-04
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	2.79E-04	Acute	0.24	1.16E-03
adult female, hands, forearms, feet & lower legs	D02b	3.03E-05	Acute	0.24	1.26E-04
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.55E-04	Acute	0.24	6.47E-04
adult consuming fruits	D03b	3.33E-05	Acute	0.24	1.39E-04
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	7.39E-06	Acute	0.24	3.08E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	3.92E-07	Chronic	0.24	1.63E-06
adult consuming fruits	D05b	8.41E-08	Chronic	0.24	3.50E-07
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	1.79E-10	Chronic	0.24	7.46E-10
adult	D06b	6.14E-11	Chronic	0.24	2.56E-10
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	2.52E-13	Chronic	0.24	1.05E-12
adult recreational fishermen	D07b	5.39E-14	Chronic	0.24	2.25E-13
children of subsistence populations	D07c	2.20E-12	Chronic	0.24	9.17E-12
adults of subsistence populations	D07d	4.72E-13	Chronic	0.24	1.96E-12

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	2.60E-01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	2.60E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	5.72E+00	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	5.15E-03	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.65E-05	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.779	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	2.58E-06	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.65E-05	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	0.779	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	1.55E-04	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.20E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	1.20E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	5.24E+00	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	8.95E-06	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.20E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	1.20E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.29E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	2.21E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.20E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	1.20E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	4.94E+01	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	3.94E-04	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	1.20E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	1.20E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	0.779	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.29E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	2.41E-05	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	1.20.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	2.87E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	0.729	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0729	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	6.46E-05	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	5.13E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	9.80E-05	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	1.20.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	2.87E-03	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	0.729	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.0729	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	6.46E-05	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	2.37E-01	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	1.06E-05	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	4.55E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.03E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	4.55E-01	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.21E-05	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	95	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	0.779	mg/mL	See Section 2
	Central (Units Converted)	779	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	7.37E-05	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	7.37E-06	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	7.19E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	3.53E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	3.53E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	8.01E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	38	days	GLEAMS
K	Decay coefficient (K)	1.82E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.0650	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	7.19E-03	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	3.53E-03	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	3.53E-03	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	1.72E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	1.38E-09	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	4.72E-10	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	3.33	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.58E-08	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	2.44E-11	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	3.33	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.58E-08	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	5.24E-12	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	3.33	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.58E-08	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	2.14E-10	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	3.33	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.38E-08	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	4.58E-08	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	4.58E-11	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	2.60E-03	Chronic	0.24	1.08E-02
boom spray (hydraulic ground spray) application	C01b	5.15E-03	Chronic	0.24	2.15E-02
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	2.58E-06	Acute	0.24	1.07E-05
wearing contaminated gloves for 1 hour	C02b	1.55E-04	Acute	0.24	6.45E-04
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	8.95E-06	Acute	0.24	3.73E-05
accidental spill to lower legs	C03b	2.21E-05	Acute	0.24	9.19E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	3.94E-04	Acute	0.24	1.64E-03
adult female, lower legs	D01b	2.41E-05	Acute	0.24	1.00E-04
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	9.80E-05	Acute	0.24	4.08E-04
adult female, hands, forearms, feet & lower legs	D02b	1.06E-05	Acute	0.24	4.42E-05
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.03E-04	Acute	0.24	4.30E-04
adult consuming fruits	D03b	2.21E-05	Acute	0.24	9.21E-05
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	7.37E-06	Acute	0.24	3.07E-05

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	8.01E-07	Chronic	0.24	3.34E-06
adult consuming fruits	D05b	1.72E-07	Chronic	0.24	7.15E-07
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	1.38E-09	Chronic	0.24	5.73E-09
adult	D06b	4.72E-10	Chronic	0.24	1.97E-09
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	2.44E-11	Chronic	0.24	1.02E-10
adult recreational fishermen	D07b	5.24E-12	Chronic	0.24	2.18E-11
children of subsistence populations	D07c	2.14E-10	Chronic	0.24	8.91E-10
adults of subsistence populations	D07d	4.58E-11	Chronic	0.24	1.91E-10

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	3.01E+00	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	3.01E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, boom spray (hydraulic ground spray) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH S	Acres treated per hour (ATH) - Spray application (S)	11	acres/hour	USDA, 1989
ATD S	Acres treated per day (ATD) - Spray application (S)	88	acres/day	HrsA (hours) × ATH S (acres/hour) / 1 day
ADR S	Absorbed dose rate (ADR) - Spray application (S)	0.0009	mg/kg per lb/day	SERA, 2001 (pg. 4-8, broadcast foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Amount handled per day (AHD) by spray application (S)				
AHD S 1	Application Rate #1	6.63E+01	lb/day	ATD (acres/day) × R (lb/acre)
Estimated acute absorbed dose for the adult male workers, assuming Spray application				
Dose 1	Application Rate #1	5.96E-02	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.54E-04	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	4.51	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	4.51	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	1.39E-04	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	1.54E-04	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	4.51	mg/mL	See Section 2
	Application Rate #1 (Units Converted)	4.51	mg/cm^3	1 mg/cm^3 per mg/mL
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	8.33E-03	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	6.84E-04	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	6.84E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	4.51	mg/mL	See Section 2
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	3.03E+01	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	2.96E-04	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	6.84E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	6.84E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	4.51	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	7.47E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	7.30E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)

D01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from direct spray to the total body for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	6.84E-04	$hour^{-1}$	SERA, 2001
PropAbs C	Proportion absorbed (PropAbs) by the total body of the children (C)	6.84E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	4.51	mg/mL	See Section 2
Amount deposited (Amt) on total body (C)				
Amt C 1	Application Rate #1	2.86E+02	mg	L (mL/cm^2) × SA C (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of children (total body)				
Dose 1	Application Rate #1	1.30E-02	mg/kg/day	Amt C (mg) × PropAbs C / BW C (kg) / 1 day (day)

D01b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for an adult female from direct spray to the lower legs for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	6.84E-04	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs of the adult female (LL)	6.84E-04	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	4.51	mg/mL	See Section 2
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	7.47E+01	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Estimated acute absorbed dose from the direct spray of adult females (lower legs)				
Dose 1	Application Rate #1	7.98E-04	mg/kg/day	Amt LL (mg) × PropAbs LL / BW LL (kg) / 1 day (day)

D02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Dermal exposure estimates for children from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
SA C	Surface Area (SA) - Child (total body) (C)	7,930	cm^2	USEPA, 1997 (Table 6-6)
Ka	Dermal absorption rates (Ka)	6.84.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs C	Proportion absorbed (PropAbs) by the total body of the child (C)	1.63E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	8.443	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.8443	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	9.33E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	7.40E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA C (cm^2)
Estimated acute absorbed dose for children from contact with contaminated vegetation				
Dose 1	Application Rate #1	8.03E-03	mg/kg/day	AmtSS (mg) × PropAbs C / BW C (kg) / 1 day (day)

D02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC

Dermal exposure estimates for an adult female (hands, forearms, feet & lower legs) from contact with contaminated vegetation for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
Tc	Duration of contact	1	hour	1 hour
Te	Duration of exposure	24	hours	The chemical is effectively removed from the surface of the skin - i.e., washing - after 24 hours
BW FA	Body Weight (BW) - Female Adult (FA)	64	kg	USEPA, 1997
SA FA1	Surface Area (SA) - Female Adult (total for hands, arms, feet, and lower legs) (A1)	3,665	cm^2	USEPA, 1997 (Table 6-4, mean)
Ka	Dermal absorption rates (Ka)	6.84.E-04	$hour^{-1}$	SERA, 2001
PropDR	Estimate of dislodgeable residue (Dr) as a proportion of application rate (Prop) shortly after application	0.1	unitless	SERA, 2001 (Pg. 4-14)
PropAbs FA1	Proportion absorbed (PropAbs) by the hands, forearms, feet & lower legs of the adult female (FA1)	1.63E-02	unitless	$1-e^{-ka\ (1/hour) \times Te\ (hour)}$
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
	Application Rate #1 (Units Converted)	8.443	$\mu g/cm^2$	11.21 $\mu g/cm^2$ per lb/acre
Dislodgeable Residue (DR)				
DR 1	Application Rate #1	0.8443	µg/cm2	R ($\mu g/cm^2$) × PropDr
Transfer Rate (TR)				
TR 1	Application Rate #1	9.33E-04	$mg/cm^2/hr$	$10^{(1.09 \times \log_{10}(DR)\ (\mu g/cm2) + 0.05)}$ / 1000 µg/mg / 1 hour (hour)
Amount transferred to Skin Surface (AmtSS)				
AmtSS 1	Application Rate #1	3.42E+00	mg	TR (mg/cm^2/hour) × Tc (hour) × SA FA1 (cm^2)
Estimated acute absorbed dose for adult females from contact with contaminated vegetation				
Dose 1	Application Rate #1	8.70E-04	mg/kg/day	AmtSS (mg) × PropAbs FA1 / BW FA1 (kg) / 1 day (day)

D03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	5.27E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	1.20E-03	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW C (kg)

D03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D_0	Drift D_0 (Assuming direct spray, no drift)	1	unitless	Assumed (no drift)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Concentration (C) on fruits (Fr)				
C Fr 1	Application Rate #1	5.27E+00	mg/kg	R (lb/acre) × RR Fr (mg/kg per lb/acre) × Drift D_0 × (1-P_{wash})
Estimated acute dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	2.56E-04	mg/kg/day	C Fr (mg/kg) × FrC (kg/day) / BW A (kg)

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	379	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	4.51	mg/mL	See Section 2
	Central (Units Converted)	4,511	mg/L	1000 mg/L per mg/mL
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.71E-03	mg/L	C F (mg/L) × V S (L) / V P (L)
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.71E-04	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D05a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	8.33E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.97E-02	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.97E-02	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by children				
Dose 1	Application Rate #1	4.47E-06	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW C (kg)

D05b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated fruits, assuming low boom application

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of Exposure	90	days	
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FrC	Fruit Consumption (FrC), total	0.0034	kg/day	76.9 $\pm$ 2.4 (per capita for South)
Drift D1 25	Low-boom drift (D1) - 25 feet down wind	0.0158	proportion of application rate	Central estimate of off-site drift, low-boom applications, very fine to fine spray (AgDrift)
RR Fr	Residual Deposition Rate (RR) - Fruit (FR)	7	mg/kg per lb/acre	Fletcher et al., 1994
t_{50}	Foliar half-time (t_{50})	15	days	USDA, 2003
K	Decay coefficient (K)	4.62E-02	day^{-1}	LN(2) / t_{50} (day)
$P_{wash}0$	Proportion removed by washing (P_{wash})	0	unitless	No washing is assumed for this scenario.
Application rates (R)				
R 1	Application Rate #1	0.753	lb/acre	Texas, 2004
Initial concentration (C 0) on fruits				
C 0 1	Application Rate #1	8.33E-02	mg/kg	R (lb/acre) × Drift × RR Fr (mg/kg per lb/acre)
Time-weighted average (TWA) concentration (C) on raw (r) fruits (Fr)				
TWA C rFr 1	Application Rate #1	1.97E-02	mg/kg	C 0 (mg/kg) × $(1-e^{-K\ (1/day) \times T\ (day)})$ / (K (1/day) × T (day))
Time-weighted average (TWA) concentration (C) on consumed (c) fruits (Fr)				
TWA C cFr 1	Application Rate #1	1.97E-02	mg/kg	TWA C rFr (mg/kg) × $(1-P_{wash})$
Estimated chronic dose from ingestion of contaminated fruits by adults				
Dose 1	Application Rate #1	9.58E-07	mg/kg/day	TWA C cFr (mg/kg) × FrC (kg/day) / BW A (kg)

D06a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by children				
Dose 1	Application Rate #1	6.81E-08	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)

D06b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults from consumption of contaminated water

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
WC A	Water Consumption (WC) - Adult	2.4	L/day	USEPA, 1997 (Pregnant lactating woman)
Concentrations (C) in water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Estimated chronic dose from ingestion of contaminated water by adults				
Dose 1	Application Rate #1	2.34E-08	mg/kg/day	C W (mg/L) × WC A (L/day) / BW A (kg)

D07a

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for child recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8.13	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.54E-06	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by child recreational fishermen				
Dose 1	Application Rate #1	2.95E-09	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW C (kg)

D07b

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adult recreational fishermen from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC RF	Fish Consumption (FC) - Recreational Fishermen (RF)	0.008	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8.13	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.54E-06	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adult recreational fishermen				
Dose 1	Application Rate #1	6.33E-10	mg/kg/day	C F (mg/kg) × FC RF (kg/day) / BW A (kg)

D07c

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8.13	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.54E-06	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by children of subsistence populations				
Dose 1	Application Rate #1	2.58E-08	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW C (kg)

D07d

HUMAN HEALTH - CHRONIC EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for adults of subsistence populations from consumption of contaminated fish

ID	Parameter/Assumption	Value	Units	Reference / Calculation
BW A	Body Weight (BW) - Adult (A)	70	kg	USEPA, 1997
FC SP	Fish Consumption (FC) - Subsistence Populations (SP)	0.07	kg/day	USEPA, 1997
BCF	Bioconcentration factor (BCF)	8.13	L/kg	log BCF = (0.76) (log Kow) - 0.23
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	6.81E-07	mg/L	See Section 2
Concentrations (C) in fish (F)				
C F 1	Application Rate #1	5.54E-06	mg/kg	C W (mg/L) × BCF (L/kg)
Estimated chronic dose from ingestion of contaminated fish by adults of subsistence populations				
Dose 1	Application Rate #1	5.54E-09	mg/kg/day	C F (mg/kg) × FC SP (kg/day) / BW A (kg)

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Accidental / Incidental Exposures - Chronic					
General Exposures - Direct Spray					
direct foliar (backpack) application	C01a	3.01E-02	Chronic	0.05	6.03E-01
boom spray (hydraulic ground spray) application	C01b	5.96E-02	Chronic	0.05	1.19E+00
Accidental / Incidental Exposures - Acute					
Dermal Exposures - Wearing Contaminated Gloves					
wearing contaminated gloves for 1 minute	C02a	1.39E-04	Acute	1.00	1.39E-04
wearing contaminated gloves for 1 hour	C02b	8.33E-03	Acute	1.00	8.33E-03
Dermal Exposures - Accidental Spill					
accidental spill to hands	C03a	2.96E-04	Acute	1.00	2.96E-04
accidental spill to lower legs	C03b	7.30E-04	Acute	1.00	7.30E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Acute / Accidental Exposures					
General Exposures - Direct Spray					
children, total body	D01a	1.30E-02	Acute	1.00	1.30E-02
adult female, lower legs	D01b	7.98E-04	Acute	1.00	7.98E-04
Dermal Exposures - Contact with Contaminated Vegetation					
children, total body	D02a	8.03E-03	Acute	1.00	8.03E-03
adult female, hands, forearms, feet & lower legs	D02b	8.70E-04	Acute	1.00	8.70E-04
Ingestion Exposures - Consumption of Contaminated Vegetation					
children consuming fruits	D03a	1.20E-03	Acute	1.00	1.20E-03
adult consuming fruits	D03b	2.56E-04	Acute	1.00	2.56E-04
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill					
children	D04	1.71E-04	Acute	1.00	1.71E-04

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day) Application Rate #1	Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity) Application Rate #1
Chronic / Longer Term Exposures					
Ingestion Exposures - Consumption of Contaminated Vegetation, assuming low boom application					
children consuming fruits	D05a	4.47E-06	Chronic	0.05	8.94E-05
adult consuming fruits	D05b	9.58E-07	Chronic	0.05	1.92E-05
Ingestion Exposures - Consumption of Contaminated Water					
children	D06a	6.81E-08	Chronic	1.00	6.81E-08
adult	D06b	2.34E-08	Chronic	0.05	4.67E-07
Ingestion Exposures - Consumption of Contaminated Fish					
child recreational fishermen	D07a	2.95E-09	Chronic	0.05	5.91E-08
adult recreational fishermen	D07b	6.33E-10	Chronic	0.05	1.27E-08
children of subsistence populations	D07c	2.58E-08	Chronic	0.05	5.17E-07
adults of subsistence populations	D07d	5.54E-09	Chronic	0.05	1.11E-07

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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C01a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
General exposure estimates for adult male workers, direct foliar (backpack) applications

ID	Parameter/Assumption	Value	Units	Reference / Calculation
HrsA	Hours of application per day (HrsA)	8	hours	8 hour work day
ATH B	Acres treated per hour (ATH) - Backpack application (B)	0.5	acres/hour	USDA, 1989
ATD B	Acres treated per day (ATD) - Backpack application (B)	4	acres/day	HrsA (hours) × ATH B (acres/hour) / 1 day
ADR B	Absorbed dose rate (ADR) - Backpack application (B)	0.01	mg/kg per lb/day	SERA, 2001 (pg. 4-8, backpack directed foliar, upper limit)
Application rates (R)				
R 1	Application Rate #1	3.77	lb/acre	Texas, 2004
R 2	Application Rate #2	1.88		
Amount handled per day (AHD) by backpack application (B)				
AHD B 1	Application Rate #1	1.51E+01	lb/day	ATD (acres/day) × R (lb/acre)
AHD B 2	Application Rate #2	7.53E+00		
Estimated acute absorbed dose for the adult male workers, assuming Backpack application				
Dose 1	Application Rate #1	1.51E-01	mg/kg/day	AHD (lb/day) × ADR (mg/kg per lb/day) / 1 day
Dose 2	Application Rate #2	7.53E-02		

C02a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 minute

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	0.0167	hours	1 minute
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	7.07E-03	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	89,880	mg/mL	Product Label (G-4), C&P Press, 2005
C F 2	Application Rate #2	89,880		
	Application Rate #1 (Units Converted)	89,880	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	89,880		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 minute				
Dose 1	Application Rate #1	1.27E+02	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	1.27E+02		

C02b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers wearing contaminated gloves for 1 hour

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
Kp	Dermal permeability coefficient (Kp)	7.07E-03	cm/hour	USEPA, 2004
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	89,880	mg/mL	Product Label (G-4), C&P Press, 2005
C F 2	Application Rate #2	89,880		
	Application Rate #1 (Units Converted)	89,880	mg/cm^3	1 mg/cm^3 per mg/mL
	Application Rate #2 (Units Converted)	89,880		
Estimated acute absorbed dose for the adult male workers wearing contaminated gloves for 1 hour				
Dose 1	Application Rate #1	7.63E+03	mg/kg/day	Kp (cm/hour) × C F (mg/cm^3) × T (hour) × SA H (cm^2) / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	7.63E+03		

C03a

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the hands

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA H	Surface Area (SA) - Hands (H)	840	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.67E-03	$hour^{-1}$	SERA, 2001
PropAbs H	Proportion absorbed (PropAbs) by the hands (H)	2.66E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	89,880	mg/mL	Product Label (G-4), C&P Press, 2005
C F 2	Application Rate #2	89,880		
Amount deposited (Amt) on hands (H)				
Amt H 1	Application Rate #1	6.04E+05	mg	L (mL/cm^2) × SA H (cm^2) × C F (mg/mL)
Amt H 2	Application Rate #2	6.04E+05		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the hands				
Dose 1	Application Rate #1	2.30E+01	mg/kg/day	Amt H (mg) × PropAbs H / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	2.30E+01		

C03b

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR ADULT WORKERS
Dermal exposure estimates for adult male workers from an accidental spill to the lower legs

ID	Parameter/Assumption	Value	Units	Reference / Calculation
T	Duration of exposure	1	hour	1 hour
BW MA	Body Weight (BW) - Male Adult (MA)	70	kg	USEPA, 1997
SA LL	Surface Area (SA) - Lower Legs (LL)	2,070	cm^2	USEPA, 1997 (Table 6-4, mean)
L	Weight of liquid adhering to surface of skin after a spill (L)	0.008	mL/cm^2	SERA, 2001 (pg. 4-11)
Ka	Dermal absorption rates (Ka)	2.67E-03	$hour^{-1}$	SERA, 2001
PropAbs LL	Proportion absorbed (PropAbs) by the lower legs (LL)	2.66E-03	unitless	$1-e^{-ka\ (1/hour) \times T\ (hour)}$
Concentration (C) in field solutions (F)				
C F 1	Application Rate #1	89,880	mg/mL	Product Label (G-4), C&P Press, 2005
C F 2	Application Rate #2	89,880		
Amount deposited (Amt) on lower legs (LL)				
Amt LL 1	Application Rate #1	1.49E+06	mg	L (mL/cm^2) × SA LL (cm^2) × C F (mg/mL)
Amt LL 2	Application Rate #2	1.49E+06		
Estimated acute absorbed dose for the adult male workers from an accidental spill to the lower legs				
Dose 1	Application Rate #1	5.66E+01	mg/kg/day	Amt LL (mg) × PropAbs LL / BW MA (kg) / 1 day (day)
Dose 2	Application Rate #2	5.66E+01		

D04

HUMAN HEALTH - ACUTE EXPOSURE SCENARIO FOR GENERAL PUBLIC
Ingestion exposure estimates for children from consumption of contaminated surface water (pond) following an accidental spill

ID	Parameter/Assumption	Value	Units	Reference / Calculation
V P on	Volume (V) of On-Site Pond (P)	1,000,000	L	Estimated based on Surface Area (1000 m^2) × Depth (1 m) × 1000 L/m^3
V S	Volume (V) of Spill (S)	11	L	Estimated
BW C	Body Weight (BW) - Child (C)	15	kg	USEPA, 1997
WC C	Water Consumption (WC) - Child, <3 years old	1.5	L/day	USEPA, 1997 (1-10 years)
Concentration (C) in field solution (F)				
C F 1	Central	89,880	mg/mL	Product Label (G-4), C&P Press, 2005
C F 2	Lower	89,880		
	Central (Units Converted)	89,879,600	mg/L	1000 mg/L per mg/mL
	Lower (Units Converted)	89,879,600		
Concentrations (C) in ambient water (W)				
C W 1	Application Rate #1	1.02E+00	mg/L	C F (mg/L) × V S (L) / V P (L)
C W 2	Application Rate #2	1.02E+00		
Estimated acute dose from ingestion of contaminated water (following an accidental spill) by children				
Dose 1	Application Rate #1	1.02E-01	mg/kg/day	C W (mg/L) × WC C (L/day) / BW C (kg)
Dose 2	Application Rate #2	1.02E-01		

E01

HUMAN HEALTH SUMMARY TABLES
Summary of worker exposure scenarios

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Accidental / Incidental Exposures - Chronic							
General Exposures - Direct Spray							
direct foliar (backpack) application	C01a	1.51E-01	7.53E-02	Chronic	0.05	3.01E+00	1.51E+00
Accidental / Incidental Exposures - Acute							
Dermal Exposures - Wearing Contaminated Gloves							
wearing contaminated gloves for 1 minute	C02a	1.27E+02	1.27E+02	Acute	1.00	1.27E+02	1.27E+02
wearing contaminated gloves for 1 hour	C02b	7.63E+03	7.63E+03	Acute	1.00	7.63E+03	7.63E+03
Dermal Exposures - Accidental Spill							
accidental spill to hands	C03a	2.30E+01	2.30E+01	Acute	1.00	2.30E+01	2.30E+01
accidental spill to lower legs	C03b	5.66E+01	5.66E+01	Acute	1.00	5.66E+01	5.66E+01

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

E02

HUMAN HEALTH SUMMARY TABLES
Summary of exposure scenarios for the general public

Scenario	Exposure Assessment Worksheet	Dose (mg/kg/day)		Toxicity (mg/kg/day)		Hazard Quotient (Dose ÷ Toxicity)	
		Application Rate #1	Application Rate #2			Application Rate #1	Application Rate #2
Acute / Accidental Exposures							
Ingestion Exposures - Consumption of Contaminated Pond Water Following an Accidental Spill							
children	D04	1.02E-01	1.02E-01	Acute	1.00	1.02E-01	1.02E-01

Notes:

Exceeds USEPA's acceptable target risk value of 1.0.

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