APPENDIX B

Ecological Risk Assessment Worksheet - Tebuthiuron

DERIVATION OF EECS

Section 3.0 of the Methods Document (ENSR 2005) presents the details of the exposure scenarios considered in the risk assessments. The following sub-sections describe the scenarios that were evaluated for bromacil. Note that in many cases, units were converted during the calculations (e.g., lb/acre converted to mg/cm^2). These conversions were not included in the equations presented below.

Direct Spray

Plant and wildlife species may be unintentionally impacted during normal application of a terrestrial herbicide as a result of a direct spray of the receptor or the waterbody inhabited by the receptor, indirect contact with dislodgeable foliar residue after herbicide application, or consumption of prey items sprayed during application. These exposures may occur within the application area (consumption of prey items) or outside of the application area (waterbodies accidentally sprayed during application of terrestrial herbicide). Generally, impacts outside of the intended application area are accidental exposures and are not typical of BLM application practices. The following direct spray scenarios were evaluated:

<u>Direct Spray of Terrestrial Wildlife</u>

Small mammal or Insect 100% Dermal Absorption

Surface Areas (A): $cm^2 = 12.3 \times BW^{0.65}$

Where: BW = body weight in grams

Amount deposited on ½ receptor (Amnt): $0.5 \times A \times R$

Where: A = Surface area in cm^2

R = Application rate in lb a.i./acre

Small mammal 1st order

Proportion absorbed over period T (Prop): 1-exp(-k T)

Where: k = First order dermal absorption rate ($hour^{-1}$)

T = Time (24 hours)

Absorbed Dose: Amnt × Prop ÷ BW

<u>Ingestion of Food Items Contaminated by Direct Spray</u>

All herbivorous receptors ingestion acute

Concentration on food (C): R × rr

Where: R = Application rate (lb a.i./acre)

rr = Residue rate as determined from Kenaga nomagram (mg/kg per lb/acre)

Dose estimates (D): C × A ÷ BW

Where: C = Concentration on food (mg/kg food)

A = Wet weight food ingestion rate (kg/day)

BW = Body Weight

All herbivorous receptors ingestion chronic

Initial concentration on food (C0): R × rr × Drift

Where: R = Application rate (lb a.i./acre)

rr = Residue rate as determined from Kenaga nomagram (mg/kg per lb/acre)

Drift = 1

Concentration on food at time T: C0 × exp(-k × T)

Where: C0 = Concentration on food at time zero (mg/kg food)

k = Decay Coefficient: ln(2) ÷ t50 ($days^{-1}$)

T = Time (90 days)

Time-weighted Average Concentration on vegetation (CTWA): C0 × (1-exp(-k × T)) ÷ (k × T)

Dose estimates (D): CTWA × A × Prop ÷ BW

Where: CTWA = Time Weighted Concentration on food (mg/kg food)

A = Wet weight food ingestion rate (kg/day)

Prop = Proportion of food impacted by direct spray (100%)

BW = Body Weight

Large carnivorous mammal ingestion acute

Amount deposited on small mammal prey (Amnt_mouse): 0.5 × SurfaceArea × R

Where: R = Application rate (lb a.i./acre)

Dose estimates: Drift × Prop × Amnt_mouse ÷ BW_mouse × A ÷BW

Where: Drift = 1
Prop = Proportion of food impacted by direct spray (100%)
A = Wet weight food ingestion rate (kg/day)
BW = Body Weight of carnivore
BW_mouse = Body weight of food (small mammal; mouse)

Large carnivorous mammal ingestion chronic

Initial concentration on mammal (C0): 0.5 × SurfaceArea × R ÷ BW_smallmammal

Where: R = Application rate (lb a.i./acre)
SurfaceArea = Surface area of food (small mammal; mouse)
BW_smallmammal = Body weight of food (small mammal; mouse)

Concentration absorbed in small mammal at time T (C90): C0 × exp(-k × T)

Where: C0 = Concentration on food at time zero (mg/kg food)
k = Decay Coefficient: ln(2)/t50 ($days^{-1}$)
T = Time (90 days)

Dose estimates: C90 × FIR_coyote × Prop ÷ BW

Where: C90 = Concentration of herbicide in food at 90 days
FIR = Wet weight food ingestion rate (mg/kg-day)
Prop = Proportion of food impacted by direct spray (100%)
BW = Body Weight

Accidental Direct Spray Over Pond

Mass in Pond (Mp): Ap × R

Where: Ap = Area of pond
R = Application rate (lb a.i./acre)

Concentration in Pond: Mp ÷ (Vp)

Where: Vp = Volume of pond

Accidental Direct Spray Over Stream

Mass in Stream Reach (Ms): As × R

Where: Ap = Area of stream affected by spray
R = Application rate (lb a.i./acre)

Concentration in Pond: Ms ÷ (Vs)

Where: Vs = Volume of stream reach affected by spray

Off-Site Drift and Surface and Ground Water Runoff

During normal application of herbicides, it is possible for a portion of the herbicide to drift outside of the treatment area and deposit onto non-target receptors. Precipitation may also result in the transport of herbicides bound to soils from the application area via surface runoff and root-zone groundwater flow. To simulate these off-site herbicide transport mechanisms, AgDRIFT® software was used to evaluate a number of possible drift scenarios and GLEAMS software was used to evaluate transport to off-site soils or waterbodies via surface runoff or root-zone ground water flow. These models provide concentrations in media. Details of the model and calculations used to obtain soil and water concentrations are presented in the Methods document (ENSR 2005). The surface water concentrations were used in the ERAs to estimate fish concentrations and consumption of these fish by an avian piscivore. The following presents those calculations:

Consumption of Fish From Contaminated Pond

Concentration in fish = Cw × BCF × FCM TL2 × FCM TL3

Where: Cw = Concentration in water (obtained from model) mg/L
BCF = Bioconcentration factor (L/kg fish)
FCM TL2 = Trophic Level 2 food chain multiplier (unitless)
FCM TL3 = Trophic Level 3 food chain multiplier (unitless)

Dose estimates (D): C × A × Prop ÷ BW

Where: C = Concentration in fish (mg/kg food)
A = Wet weight food ingestion rate (kg/day)
Prop = Proportion of food impacted (100%)
BW = Body Weight

Accidental Spill to Pond

To represent worst-case potential impacts to ponds, a spill scenario was considered. A truck or helicopter spilling an entire load of herbicide mixed for the maximum application rate into a 1/4 acre, 1 meter deep pond.

Truck or Helicopter Spill into Pond

Concentrations in water (Cw): Cm × Vspill ÷ Vp

Where: Cm = Herbicide concentration in the truck or helicopter mixture (mg a.i./L)
Vspill = Volume of the spill (L)
Vp = Volume of the pond (L)

LIST OF TABLES

B-1 Direct Spray of Terrestrial Receptors and Exposure from Indirect Contact with Foliage. B-1
B-2 Potential Risks to Small Herbivorous/Omnivorous Mammal (Deer Mouse) From Consumption of Contaminated Fruit (Acute Exposure Scenario)……B-2
B-3 Potential Risks to Small Herbivorous/Omnivorous Mammal (Deer Mouse) From Consumption of Contaminated Fruit (Chronic Exposure Scenario)..... B-3
B-4 Potential Risks to Large Herbivorous Mammal (Mule Deer) From Consumption of Contaminated Vegetation (Acute Exposure Scenario)……..B-4
B-5 Potential Risks to Large Herbivorous Mammal (Mule Deer) From Consumption of Contaminated Vegetation (Chronic Exposure Scenario). B-5
B-6 Potential Risks to Carnivorous Mammal (Coyote) From Consumption of Contaminated Small Mammals (Acute Exposure Scenario).....B-6
B-7 Potential Risks to Carnivorous Mammal (Coyote) From Consumption of Contaminated Small Mammals (Chronic Exposure Scenario) B-7
B-8 Potential Risks to Insectivorous Bird (American Robin) From Consumption of Contaminated Insects (Acute Exposure Scenario) B-8
B-9 Potential Risks to Insectivorous Bird (American Robin) From Consumption of Contaminated Insects (Chronic Exposure Scenario).....B-9
B-10 Potential Risks to Herbivorous Bird (Canada goose) From Consumption of Contaminated Vegetation (Acute Exposure Scenario).....B-10
B-11 Potential Risks to Herbivorous Bird (Canada goose) From Consumption of Contaminated Vegetation (Chronic Exposure Scenario) B-11
B-12 Potential Risks to Aquatic Species from Accidental Spray Drift to Pond B-12
B-13 Potential Risks to Aquatic Species from Accidental Spray Drift to Stream B-13
B-14 Potential Risks to Non-target Terrestrial Plants from Direct Spray and Spray Drift.....B-14
B-15 Potential Risk to Predatory Bird (Bald Eagle) From Consumption of Contaminated Fish from Pond (Pond Impacted by Spray Drift Modeled in AgDrift) B-15
B-16 Potential Risks to Aquatic Species from Surface Runoff to Pond B-16
B-17 Potential Risks to Aquatic Species From Surface Runoff to Stream B-17
B-18 Potential Risks to Non-Target Terrestrial Plants from Surface Runoff B-18
B-19 Potential Risk to Predatory Bird (Bald Eagle) From Long-term Consumption of Contaminated Fish from Pond (Pond Impacted by Surface Runoff Modeled in GLEAMS) B-19
B-20 Potential Risks to Non-Target Terrestrial Plants From Herbicide in Dust Deposited From Wind Erosion.....B-20
B-21 Potential Risks to Aquatic Species From Accidental Spill to Pond (Acute Exposure) B-21
B-22 Potential Risks to Aquatic Species From Accidental Direct Spray of Pond and Stream (Acute Exposure) B-22

General note: Exposure parameters and equations in the following tables are described in more detail in the *Vegetation Treatments Programmatic EIS Ecological Risk Assessment Methodology* (ENSR 2005) and Section 4 of the ecological risk assessment for this herbicide.

TABLE B-1

Direct Spray of Terrestrial Receptors and Exposure from Indirect Contact with Foliage

Parameter		Pollinating Insect	Small Mammal	Units
Duration of exposure (T)		24	24	hours
Body weight (BW)		0.000093	0.02	kg
Surface areas (A): cm^2 = 12.3 × BW(g)^0.65 [1]		2.63	86.21	cm^2
Application rates (R)	Typical	0.5	0.5	lb/acre
	Maximum	4	4	lb/acre
Amount deposited on ½ receptor (Amnt):	Typical	0.0074	0.2416	mg
0.5 × A × R × cf [2]	Maximum	0.059	1.9326	mg
Dose Estimate Assuming 100% Dermal Adsorption[3]				
Absorbed Dose: Amnt × Prop / BW	Typical	7.92E+01	1.21E+01	mg/kg bw
	Maximum	6.34E+02	9.66E+01	mg/kg bw
Dose Estimate Assuming First Order Dermal Adsorption[4]				
First-order dermal absorption coefficient (k)	Central Estimate		0.0231	$hour^{-1}$
Proportion absorbed over period T (Prop):	Typical		0.0981	unitless
1-exp(-k×T) [5]	Maximum		0.0981	unitless
Absorbed dose: Amnt × Prop / BW	Typical		1.18E+00	mg/kg bw
	Maximum		9.47E+00	mg/kg bw

RISK QUOTIENTS[6] **- Direct Spray**	**Toxicity Reference Value (mg/kg bw)**[7]	**Typical Application**	**Maximum Application**
Small mammal - 100% absorption	64	6.51E-04	5.21E-03
Pollinating insect - 100% absorption	323	2.45E-01	1.96E+00
Small mammal - 1st order dermal adsorption	64	6.38E-05	5.10E-04

RISK QUOTIENTS - Indirect Contact[8]	**Toxicity Reference Value (mg/kg bw)**[7]	**Typical Application**	**Maximum Application**
Small mammal - 100% absorption	64	6.51E-05	5.21E-04
Pollinating insect - 100% absorption	323	2.45E-02	1.96E-01
Small mammal - 1st order dermal adsorption	64	6.38E-06	5.10E-05

[1] Surface area calculation for mammals from Stahl (1967; presented in USEPA 1993). No surface area calculation identified for insects. Mammalian equation used as a surrogate.
[2] A conversion factor (cf) of 0.011208493 was used to convert the application rate (R) from lb/acre to mg/cm^2.
[3] 100% dermal absorption - all of the herbicide falling on the receptor was assumed to penetrate the skin within 24 hours.
[4] 1st order dermal absorption - absorption occurs over 24 hours, taking into consideration the potential for some herbicide to not be absorbed.
[5] exp(-k×T) = e^(-k×T), where e is a constant = 2.7828.
[6] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[7] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.
[8] Exposure from indirect contact assumed to be 1/10 of direct spray exposure (Harris and Solomon 1992).

TABLE B-2

Potential Risks to Small Herbivorous/Omnivorous Mammal (Deer Mouse) From Consumption of Contaminated Fruit (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		0.02	kg
Food ingestion rate (dry weight [dw]) [1]		0.003364	kg dw/day
Food ingestion rate (wet weight [ww]) (ir) [2]		0.01463	kg ww/day
Application rates (R)	Typical	0.5	lb/acre
	Maximum	0.4	lb/acre
Residue rate – berries (rr) [3]	Typical	5.4	mg/kg per lb/acre
	Maximum	40.7	mg/kg per lb/acre
Concentration on berries (C): R × rr	Typical	2.7	mg/kg fruit
	Maximum	162.8	mg/kg fruit
Dose estimates (D): C × ir / BW	Typical	1.97E+00	mg/kg bw
	Maximum	1.19E+02	mg/kg bw

RISK QUOTIENTS[4] **- Ingestion**	**Toxicity Reference Value (mg/kg bw)**[5]	**Typical Application**	**Maximum Application**
Small mammalian herbivore/omnivore (acute exposure)	64	3.09E-02	1.86E+00

[1] Calculated using algorithm developed by Nagy (1987) for rodents; where food ingestion rate (g dw/day) = 0.621× (BW g)^0.564; converted into kg dw/day.
[2] Assumes fruit is 77% water (USEPA 1993; Table 4-2 - value for fruit pulp and skin).
[3] Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.
[4] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[5] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-3

Potential Risks to Small Herbivorous/Omnivorous Mammal (Deer Mouse) From Consumption of Contaminated Fruit (Chronic Exposure Scenario)

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	days
Body weight (BW)		0.02	kg
Food ingestion rate (dry weight [dw]) [1]		0.003364	kg dw/day
Food ingestion rate (wet weight [ww]) (ir) [2]		0.01463	kg ww/day
Half life on vegetation (t_{50})	Herbicide specific	30	days
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Residue rate - berries (rr) [3]	Typical	5.4	mg/kg per lb/acre
	Maximum	40.7	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): ln(2) / t_{50} [4]	Typical	0.0231	$days^{-1}$
	Maximum	0.0231	$days^{-1}$
Initial concentration on berries (C_0): R × rr × Drift	Typical	2.7	mg/kg fruit
	Maximum	162.8	mg/kg fruit
Concentration on berries at time T: C_0 × exp(-k×T) [5]	Typical	0.3375	mg/kg fruit
	Maximum	20.35	mg/kg fruit
Time-weighted average concentration on vegetation	Typical	1.1361	mg/kg fruit
(CTWA): C_0 × (1-exp(-k×T)) / (k×T) [5]	Maximum	68.5040	mg/kg fruit
Proportion of diet contaminated (PC)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates (D): (CTWA × ir × PC) / BW	Typical	8.31E-01	mg/kg bw/day
	Maximum	5.01E+01	mg/kg bw/day

RISK QUOTIENTS[6] – Ingestion	Toxicity Reference Value (mg/kg bw/day)[7]	Typical Application	Maximum Application
Small mammalian herbivore/omnivore (chronic exposure)	14	5.93E-02	3.58E+00

[1] Calculated using algorithm developed by Nagy (1987) for rodents; where food ingestion rate (g dw/day) = 0.621×(BW g)^0.564; converted into kg dw/day.
[2] Assumes fruit is 77% water (USEPA 1993; Table 4-2 - value for fruit pulp and skin).
[3] Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.
[4] ln = Natural log function.
[5] exp(-k×T) = e^(-k×T), where e is a constant = 2.7828.
[6] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[7] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-4

Potential Risks to Large Herbivorous Mammal (Mule Deer) From Consumption of Contaminated Vegetation (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		70	kg
Food ingestion rate (dry weight [dw]) [1]		1.9212	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		6.4038	kg ww/day
Duration of exposure (D)		1	day
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Residue rate - grass (rr) [3]	Typical	36	mg/kg per lb/acre
	Maximum	197	mg/kg per lb/acre
Concentration on grass (C): R × rr	Typical	18	mg/kg grass
	Maximum	788	mg/kg grass
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Proportion of diet contaminated (PC)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: (Drift × PC × C × ir) / BW	Typical	1.65E+00	mg/kg bw/day
	Maximum	7.21E+01	mg/kg bw/day

RISK QUOTIENTS[4] – Ingestion	**Toxicity Reference Value (mg/kg bw/day)[5]**	**Typical Application**	**Maximum Application**
Large mammalian herbivore/gramivore (acute exposure)	326	5.05E-03	2.21E-01

[1] Calculated using algorithm developed by Nagy (1987) for herbivores; where food ingestion rate (g dw/day) = 0.577×(BW g)^0.727; converted into kg dw/day.
[2] Assumes grass is 70% water (USEPA 1993; Table 4-2 - lowest value for young grasses).
[3] Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.
[4] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[5] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-5

Potential Risks to Large Herbivorous Mammal (Mule Deer) From Consumption of Contaminated Vegetation (Chronic Exposure Scenario)

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	day
Body weight (BW)		70	kg
Food ingestion rate (dry weight [dw]) [1]		1.9212	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		6.4038	kg ww/day
Half life on vegetation (t_{50})	Herbicide specific	30	days
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Residue rate - grass (rr) [3]	Typical	36	mg/kg per lb/acre
	Maximum	197	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): ln(2) / t_{50} [4]	Typical	0.0231	$days^{-1}$
	Maximum	0.0231	$days^{-1}$
Initial concentration on grass (C_0): R × rr × Drift	Typical	18	mg/kg grass
	Maximum	788	mg/kg grass
Concentration on grass at time T: C_0 × exp(-k×T) [5]	Typical	2.25	mg/kg grass
	Maximum	98.5	mg/kg grass
Time-weighted average concentration on vegetation (CTWA): C_0 × (1-exp(-k×T)) / (k×T) [5]	Typical	7.5741	mg/kg vegetation
	Maximum	331.5794	mg/kg vegetation
Proportion of diet contaminated (PC)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates (D): (CTWA × ir × PC) / BW	Typical	6.93E-01	mg/kg bw/day
	Maximum	3.03E+01	mg/kg bw/day

RISK QUOTIENTS[6] – Ingestion	**Toxicity Reference Value (mg/kg bw/day)[7]**	**Typical Application**	**Maximum Application**
Large mammalian herbivore/gramivore (chronic exposure)	8	8.66E-02	3.79E+00

[1] Calculated using algorithm developed by Nagy (1987) for herbivores; where food ingestion rate (g dw/day) = 0.577×(BW g)^0.727; converted into kg dw/day.
[2] Assumes grass is 70% water (USEPA 1993; Table 4-2 - lowest value for young grasses).
[3] Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.
[4] ln = Natural log function.
[5] exp(-k×T) = e^(-k×T), where e is a constant = 2.7828.
[6] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[7] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-6

Potential Risks to Carnivorous Mammal (Coyote) From Consumption of Contaminated Small Mammals (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		12	Kg
Body weight small mammal (BW_mouse)		0.02	Kg
Surface area small mammal (A)		86.21	cm^2
Food ingestion rate (dry weight [dw]) [1]		0.5297	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		1.6554	kg ww/day
Duration of exposure (D)		1	Day
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Amount deposited on small mammal prey (Amnt_mouse): 0.5 × A × R [3]	Typical	0.2416	Mg
	Maximum	1.9326	Mg
Drift (Drift)	Typical	1	Unitless
	Maximum	1	Unitless
Proportion of diet contaminated (PC)	Typical	1	Unitless
	Maximum	1	Unitless
Dose estimates (D): ([(Drift × PC × Amnt_mouse) / BW_mouse] × ir) / BW	Typical	1.67E+00	mg/kg bw
	Maximum	1.33E+01	mg/kg bw

RISK QUOTIENTS[4] - Ingestion	Toxicity Reference Value (mg/kg bw)[5]	Typical Application	Maximum Application
Large carnivorous mammal (acute exposure)	507	3.29E-03	2.63E-02

[1] Calculated using algorithm developed by Nagy (1987); where food ingestion rate (g dw/day) = 0.0687×(BW g)^0.822; converted into kg dw/day.
[2] Assumes mammals are 68% water (USEPA 1993).
[3] Surface area (A) and body weight of mouse receptor presented in Table B-1. Surface area calculation for mammals from Stahl (1967; presented in USEPA 1993).
[4] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[5] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-7

Potential Risks to Carnivorous Mammal (Coyote) From Consumption of Contaminated Small Mammals (Chronic Exposure Scenario)

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	Day
Body weight (BW)		12	Kg
Body weight small mammal (BW_mouse)		0.02	Kg
Surface area small mammal (A)		86.21	cm^2
Food ingestion rate (dry weight [dw]) [1]		0.5297	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		1.6554	kg ww/day
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Drift (Drift)	Typical	1	Unitless
	Maximum	1	Unitless
Decay coefficient (k): ln(2) / t_{50} [3]	Typical	0.0231	$days^{-1}$
	Maximum	0.0231	$days^{-1}$
Initial concentration on mammal (C_0): (0.5 × A × R) / BW_mouse	Typical	12.0786	mg /kg mammal
	Maximum	96.6284	mg /kg mammal
Concentration absorbed in small mammal at time T (C_{90}): C_0 × exp(-k×T) [4]	Typical	1.1843	mg/kg mammal
	Maximum	9.4748	mg/kg mammal
Proportion of diet contaminated (PC)	Typical	1	Unitless
	Maximum	1	Unitless
Dose estimates: (C_{90} × ir × PC) / BW	Typical	1.63E-01	mg/kg bw/day
	Maximum	1.31E+00	mg/kg bw/day

RISK QUOTIENTS - Ingestion[5]	Toxicity Reference Value (mg/kg bw/day)[6]	Typical Application	Maximum Application
Large mammalian carnivore (chronic exposure)	13	1.26E-02	1.01E-01

[1] Calculated using algorithm developed by Nagy (1987); where food ingestion rate (g dw/day) = 0.0687×(BW g)^0.822; converted into kg dw/day.
[2] Assumes mammals are 68% water (USEPA 1993).
[3] ln = Natural log function.
[4] exp(-k×T) = e^(-k×T), where e is a constant = 2.7828.
[5] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[6] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-8

Potential Risks to Insectivorous Bird (American Robin) From Consumption of Contaminated Insects (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		0.08	Kg
Food ingestion rate (dry weight [dw]) [1]		0.0112	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		0.0363	kg ww/day
Duration of exposure (D)		1	Day
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Residue rate - insects (rr) [3]	Typical	45	mg/kg per lb/acre
	Maximum	350	mg/kg per lb/acre
Concentration on insects (C): R × rr	Typical	22.5	mg/kg insect
	Maximum	1400	mg/kg insect
Drift (Drift)	Typical	1	Unitless
	Maximum	1	Unitless
Proportion of diet contaminated (PC)	Typical	1	Unitless
	Maximum	1	Unitless
Dose estimates: (Drift × PC × C × ir) / BW	Typical	1.02E+01	mg/kg bw
	Maximum	6.35E+02	mg/kg bw

RISK QUOTIENTS[4] **– Ingestion**	**Toxicity Reference Value (mg/kg bw)**[5]	**Typical Application**	**Maximum Application**
Small insectivorous bird (acute exposure)	15440	6.61E-04	4.11E-02

[1] Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^0.651.
[2] Assumes insects are 69% water (USEPA 1993; Table 4-1 - value for grasshoppers and crickets).
[3] Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994).
[4] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[5] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-9

Potential Risks to Insectivorous Bird (American Robin) From Consumption of Contaminated Insects (Chronic Exposure Scenario)

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	day
Body weight (BW)		0.08	kg
Food ingestion rate (dry weight [dw]) [1]		0.0112	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		0.0363	kg ww/day
Half life on insect (t_{50})	Herbicide specific	30	days
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Residue rate - insects (rr) [3]	Typical	45	mg/kg per lb/acre
	Maximum	350	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): ln(2) / t_{50} [4]	Typical	0.0231	$days^{-1}$
	Maximum	0.0231	$days^{-1}$
Initial concentration on insects (C_0): R × rr × Drift	Typical	22.5	mg/kg insect
	Maximum	1400	mg/kg insect
Concentration on insects at time T	Typical	2.8125	mg/kg insect
(C_{90}): C_0 × exp(-k×T) [5]	Maximum	175	mg/kg insect
Time-weighted average concentration on insects	Typical	9.4677	mg/kg insect
(CTWA): C_0 × (1-exp(-k×T)) / (k×T) [5]	Maximum	589.1005	mg/kg insect
Proportion of diet contaminated (PC)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates (D): (CTWA × ir × PC) / BW	Typical	4.29E+00	mg/kg bw/day
	Maximum	2.67E+02	mg/kg bw/day

RISK QUOTIENTS[6] **– Ingestion**	**Toxicity Reference Value (mg/kg bw/day)**[7]	**Typical Application**	**Maximum Application**
Small insectivorous bird (chronic exposure)	1,029	4.17E-03	2.60E-01

[1] Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^0.651.
[2] Assumes insects are 69% water (USEPA 1993; Table 4-1 - value for grasshoppers and crickets).
[3] Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994).
[4] ln = Natural log function.
[5] exp(-k×T) = e^(-k×T), where e is a constant = 2.7828.
[6] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[7] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-10

Potential Risks to Herbivorous Bird (Canada goose) From Consumption of Contaminated Vegetation (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		3.72	kg
Food ingestion rate (dry weight [dw]) [1]		0.1368	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		0.9125	kg ww/day
Duration of exposure (D)		1	day
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Residue rate - vegetation (rr) [3]	Typical	35	mg/kg per lb/acre
	Maximum	296	mg/kg per lb/acre
Concentration on vegetation (C): R × rr	Typical	17.5	mg/kg veg
	Maximum	1184	mg/kg veg
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Proportion of diet contaminated (PC)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: (Drift × PC × C × ir) / BW	Typical	4.29E+00	mg/kg bw
	Maximum	2.90E+02	mg/kg bw

RISK QUOTIENTS[4] **- Ingestion**	**Toxicity Reference Value (mg/kg bw)**[5]	**Typical Application**	**Maximum Application**
Large herbivorous bird - acute exposure	2,545	1.69E-03	1.14E-01

[1]Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^0.651.
[2]Assumes vegetation is 85% water (USEPA 1993; Table 4-2 - value for dicotyledons).
[3]Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.
[4]Risk Quotient = Estimated Dose/Toxicity Reference Value.
[5]Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-11

Potential Risks to Herbivorous Bird (Canada goose) From Consumption of Contaminated Vegetation – (Chronic Exposure Scenario)

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	day
Body weight (BW)		3.72	kg
Food ingestion rate (dry weight [dw]) [1]		0.1369	Kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]		0.9126	Kg ww/day
Half life on vegetation (t_{50})	Herbicide specific	30	days
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Residue rate - vegetation (rr) [3]	Typical	35	mg/kg per lb/acre
	Maximum	296	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): ln(2) / t_{50} [4]	Typical	0.0231	$days^{-1}$
	Maximum	0.0231	$days^{-1}$
Initial concentration on vegetation (C_0): R × rr × Drift	Typical	17.5	Mg/kg veg
	Maximum	1184	Mg/kg veg
Concentration on vegetation at time T	Typical	2.1875	Mg/kg veg
(C_{90}) : C_0 × exp(-k×T) [5]	Maximum	148	Mg/kg veg
Time-weighted Average Concentration on vegetation	Typical	7.3638	Mg/kg veg
(CTWA): C_0 × (1-exp(-k×T))/(k×T) [5]	Maximum	498.2107	Mg/kg veg
Proportion of diet contaminated (PC)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates (D): (CTWA × ir × PC) / BW	Typical	1.81E+00	mg/kg bw/day
	Maximum	1.22E+02	mg/kg bw/day

RISK QUOTIENTS[6] **- Ingestion**	**Toxicity Reference Value (mg/kg bw/day)**[7]	**Typical Application**	**Maximum Application**
Large herbivorous bird (chronic exposure)	1,000	1.81E-03	1.22E-01

[1] Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^0.651.
[2] Assumes vegetation is 85% water (USEPA 1993; Table 4-2 - value for dicotyledons).
[3] Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.
[4] ln = Natural log function.
[5] exp(-k×T) = e^(-k×T), where e is a constant = 2.7828.
[6] Risk Quotient = Estimated Dose/Toxicity Reference Value.
[7] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-12

Potential Risks to Aquatic Species from Accidental Spray Drift to Pond

OFF-SITE DRIFT - modeled in AgDrift TYPICAL APPLICATION RATE									
				Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
Mode of Application	Application Height or Type	Distance from Receptor (ft)	Pond Concentration (mg/L)	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Ground	Low Boom	25	3.41E-04	3.04E-06	1.15E-06	6.82E-03	3.67E-05	3.41E-03	2.62E-02
Ground	Low Boom	100	1.87E-04	1.67E-06	6.30E-07	3.74E-03	2.01E-05	1.87E-03	1.44E-02
Ground	Low Boom	900	3.61E-05	3.22E-07	1.22E-07	7.22E-04	3.88E-06	3.61E-04	2.78E-03
Ground	High Boom	25	5.47E-04	4.88E-06	1.84E-06	1.09E-02	5.88E-05	5.47E-03	4.21E-02
Ground	High Boom	100	2.88E-04	2.57E-06	9.70E-07	5.76E-03	3.10E-05	2.88E-03	2.22E-02
Ground	High Boom	900	4.58E-05	4.09E-07	1.54E-07	9.16E-04	4.92E-06	4.58E-04	3.52E-03
OFF-SITE DRIFT - modeled in AgDrift MAXIMUM APPLICATION RATE									
				Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
Mode of Application	Application Height or Type	Distance from Receptor (ft)	Pond Concentration (mg/L)	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Ground	Low Boom	25	1.58E-03	1.41E-05	5.32E-06	3.16E-02	1.70E-04	1.58E-02	1.22E-01
Ground	Low Boom	100	7.85E-04	7.01E-06	2.64E-06	1.57E-02	8.44E-05	7.85E-03	6.04E-02
Ground	Low Boom	900	1.31E-04	1.17E-06	4.41E-07	2.62E-03	1.41E-05	1.31E-03	1.01E-02
Ground	High Boom	25	3.00E-03	2.68E-05	1.01E-05	6.00E-02	3.23E-04	3.00E-02	2.31E-01
Ground	High Boom	100	1.40E-03	1.25E-05	4.71E-06	2.80E-02	1.51E-04	1.40E-02	1.08E-01
Ground	High Boom	900	1.75E-04	1.56E-06	5.89E-07	3.50E-03	1.88E-05	1.75E-03	1.35E-02

[1]Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-13

Potential Risks to Aquatic Species from Accidental Spray Drift to Stream

OFF-SITE DRIFT - modeled in AgDrift TYPICAL APPLICATION RATE									
				Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Stream Concentration (mg/L)	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Ground	Low Boom	25	6.13E-04	5.48E-06	2.06E-06	1.23E-02	6.59E-05	6.13E-03	4.72E-02
Ground	Low Boom	100	1.80E-04	1.60E-06	6.05E-07	3.59E-03	1.93E-05	1.80E-03	1.38E-02
Ground	Low Boom	900	1.86E-05	1.66E-07	6.26E-08	3.72E-04	2.00E-06	1.86E-04	1.43E-03
Ground	High Boom	25	1.03E-03	9.17E-06	3.46E-06	2.05E-02	1.10E-04	1.03E-02	7.90E-02
Ground	High Boom	100	2.91E-04	2.60E-06	9.79E-07	5.82E-03	3.13E-05	2.91E-03	2.24E-02
Ground	High Boom	900	2.46E-05	2.20E-07	8.28E-08	4.92E-04	2.64E-06	2.46E-04	1.89E-03

OFF-SITE DRIFT - modeled in AgDrift MAXIMUM APPLICATION RATE									
				Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Stream Concentration (mg/L)	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Ground	Low Boom	25	4.91E-03	4.38E-05	1.65E-05	9.81E-02	5.28E-04	4.91E-02	3.77E-01
Ground	Low Boom	100	1.44E-03	1.28E-05	4.84E-06	2.87E-02	1.55E-04	1.44E-02	1.11E-01
Ground	Low Boom	900	1.49E-04	1.33E-06	5.01E-07	2.98E-03	1.60E-05	1.49E-03	1.14E-02
Ground	High Boom	25	8.22E-03	7.34E-05	2.77E-05	1.64E-01	8.84E-04	8.22E-02	6.32E-01
Ground	High Boom	100	2.33E-03	2.08E-05	7.84E-06	4.65E-02	2.50E-04	2.33E-02	1.79E-01
Ground	High Boom	900	1.97E-04	1.76E-06	6.62E-07	3.93E-03	2.12E-05	1.97E-03	1.51E-02

[1]Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-14

Potential Risks to Non-target Terrestrial Plants from Direct Spray and Spray Drift

DIRECT SPRAY	Terrestrial Concentration (lb/acre)[1]	Typical Species RQ[2]	Rare, Threatened, and Endangered Species RQ[2]
Typical application rate	0.5	1.67E+01	5.00E+01
Maximum application rate	4	1.33E+02	4.00E+02

OFF-SITE DRIFT - modeled in AgDrift TYPICAL APPLICATION RATE					
Mode of Application	**Application Height or Type**	**Distance from Receptor (ft)**	**Soil Concentration (lb/acre)[1]**	**Typical Species RQ[2]**	**Rare, Threatened, and Endangered Species RQ[2]**
Ground	Low Boom	25	6.30E-03	2.10E-01	6.30E-01
Ground	Low Boom	100	2.20E-03	7.33E-02	2.20E-01
Ground	Low Boom	900	3.00E-04	1.00E-02	3.00E-02
Ground	High Boom	25	1.04E-02	3.47E-01	1.04E+00
Ground	High Boom	100	3.50E-03	1.17E-01	3.50E-01
Ground	High Boom	900	4.00E-04	1.33E-02	4.00E-02
OFF-SITE DRIFT - modeled in AgDrift MAXIMUM APPLICATION RATE					
Mode of Application	**Application Height or Type**	**Distance from Receptor (ft)**	**Soil Concentration (lb/acre)[1]**	**Typical Species RQ[2]**	**Rare, Threatened, and Endangered Species RQ[2]**
Ground	Low Boom	25	3.33E-02	1.11E+00	3.33E+00
Ground	Low Boom	100	9.60E-03	3.20E-01	9.60E-01
Ground	Low Boom	900	1.20E-03	4.00E-02	1.20E-01
Ground	High Boom	25	6.59E-02	2.20E+00	6.59E+00
Ground	High Boom	100	1.77E-02	5.90E-01	1.77E+00
Ground	High Boom	900	1.70E-03	5.67E-02	1.70E-01

[1] a.i. = active ingredient.
[2] RQ = Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-15

Potential Risk to Predatory Bird from Consumption of Contaminated Fish from Pond (Pond Impacted by Spray Drift Modeled in AgDrift)

Parameters/ Assumptions	Value	Units
Body weight (BW)	5.15	kg
Food ingestion rate (dry weight [dw]) [1]	0.1018	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]	0.4072	kg ww/day
Bioconcentration factor (BCF)	2.63	L/kg fish
Proportion of diet contaminated (PC)	1	unitless
Toxicity reference value (TRV) [3]	1,000	mg/kg-bw/day

TYPICAL APPLICATION RATE						
Mode of Application	**Application Height or Type**	**Distance From Receptor (ft)**	**Pond Concentration**[4] **(C_{pond} mg/L)**	**Concentration in fish (C_{Fish}): C_{pond} × BCF**	**Dose estimate (D): (C_{Fish} × ir × PC) / BW**	**Risk Quotient**[5]
Ground	Low Boom	25	3.41E-04	8.97E-04	7.09E-05	7.09E-08
Ground	Low Boom	100	1.87E-04	4.92E-04	3.89E-05	3.89E-08
Ground	Low Boom	900	3.61E-05	9.49E-05	7.51E-06	7.51E-09
Ground	High Boom	25	5.47E-04	1.44E-03	1.14E-04	1.14E-07
Ground	High Boom	100	2.88E-04	7.57E-04	5.99E-05	5.99E-08
Ground	High Boom	900	4.58E-05	1.20E-04	9.52E-06	9.52E-09
MAXIMUM APPLICATION RATE						
Mode of Application	**Application Height or Type**	**Distance From Receptor (ft)**	**Pond Concentration**[4] **(C_{pond} mg/L)**	**Concentration in fish (C_{Fish}): C_{pond} × BCF**	**Dose estimate (D): (C_{Fish} × ir × PC) / BW**	**Risk Quotient**[5]
Ground	Low Boom	25	1.58E-03	4.16E-03	3.29E-04	3.29E-07
Ground	Low Boom	100	7.85E-04	2.06E-03	1.63E-04	1.63E-07
Ground	Low Boom	900	1.31E-04	3.45E-04	2.72E-05	2.72E-08
Ground	High Boom	25	3.00E-03	7.89E-03	6.24E-04	6.24E-07
Ground	High Boom	100	1.40E-03	3.68E-03	2.91E-04	2.91E-07
Ground	High Boom	900	1.75E-04	4.60E-04	3.64E-05	3.64E-08

[1] Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^0.651.
[2] Assumes fish are 75% water (USEPA 1993; Table 4-1 - value for bony fishes).
[3] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.
[4] Pond concentrations in spray drift scenarios were calculated by the AgDRIFT. See associated report methodology document for further details.
[5] Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-16

Potential Risks to Aquatic Species from Surface Runoff to Pond

SURFACE RUNOFF - Modeled in GLEAMS - TYPICAL APPLICATION RATE

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_BASE_SAND_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	1.41E-01	1.28E-01	1.26E-03	4.76E-04	2.83E+00	1.37E-02	1.28E+00	9.82E+00
G_BASE_CLAY_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	2.01E-03	3.54E-04	1.80E-05	6.78E-06	4.03E-02	3.81E-05	3.54E-03	2.73E-02
G_BASE_LOAM_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	2.35E-04	2.06E-04	2.10E-06	7.92E-07	4.71E-03	2.22E-05	2.06E-03	1.59E-02
G_BASE_SAND_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	1.76E-02	4.08E-03	1.57E-04	5.93E-05	3.52E-01	4.39E-04	4.08E-02	3.14E-01
G_BASE_CLAY_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	3.73E-02	1.70E-02	3.33E-04	1.26E-04	7.46E-01	1.83E-03	1.70E-01	1.31E+00
G_BASE_LOAM_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	3.68E-02	3.41E-02	3.29E-04	1.24E-04	7.36E-01	3.67E-03	3.41E-01	2.62E+00
G_BASE_SAND_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	1.02E-01	2.16E-02	9.10E-04	3.43E-04	2.04E+00	2.33E-03	2.16E-01	3.14E-01
G_BASE_CLAY_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	1.28E-01	1.73E-02	1.15E-03	4.32E-04	2.57E+00	1.86E-03	1.73E-01	1.33E+00
G_BASE_LOAM_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.46E-01
G_BASE_SAND_100_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	9.91E-02	4.08E-02	8.84E-04	3.34E-04	1.98E+00	4.38E-03	4.08E-01	3.14E+00
G_BASE_CLAY_100_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	6.64E-02	9.52E-03	5.92E-04	2.23E-04	1.33E+00	1.02E-03	9.52E-02	7.32E-01
G_BASE_LOAM_100_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.37E-02	1.66E-03	1.22E-04	4.60E-05	2.73E-01	1.78E-04	1.66E-02	1.27E-01
G_BASE_SAND_150_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	9.03E-02	3.08E-02	8.06E-04	3.04E-04	1.81E+00	3.31E-03	3.08E-01	2.37E+00
G_BASE_CLAY_150_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	2.90E-02	7.25E-03	2.59E-04	9.77E-05	5.80E-01	7.79E-04	7.25E-02	5.57E-01

TABLE B-16 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Pond

SURFACE RUNOFF - Modeled in GLEAMS - TYPICAL APPLICATION RATE															
								Pond Concentrations (mg/L)		Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_BASE_LOAM_150_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	2.66E-02	4.36E-03	2.38E-04	8.97E-05	5.33E-01	4.69E-04	4.36E-02	3.35E-01
G_BASE_SAND_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	8.17E-02	1.95E-02	7.29E-04	2.75E-04	1.63E+00	2.10E-03	1.95E-01	1.50E+00
G_BASE_CLAY_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	3.09E-02	6.17E-03	2.76E-04	1.04E-04	6.18E-01	6.63E-04	6.17E-02	4.74E-01
G_BASE_LOAM_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	2.93E-02	6.57E-03	2.61E-04	9.85E-05	5.85E-01	7.06E-04	6.57E-02	5.05E-01
G_BASE_SAND_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	8.11E-02	1.20E-02	7.24E-04	2.73E-04	1.62E+00	1.29E-03	1.20E-01	9.26E-01
G_BASE_CLAY_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	4.11E-02	5.50E-03	3.67E-04	1.38E-04	8.21E-01	5.91E-04	5.50E-02	4.23E-01
G_BASE_LOAM_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	2.96E-02	7.92E-03	2.64E-04	9.96E-05	5.92E-01	8.52E-04	7.92E-02	6.09E-01
G_ARV1_050_POND_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	1.20E-02	1.05E-02	1.07E-04	4.05E-05	2.41E-01	1.13E-03	1.05E-01	8.08E-01
G_ARV2_050_POND_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	1.84E-02	1.12E-02	1.64E-04	6.19E-05	3.68E-01	1.21E-03	1.12E-01	8.65E-01
G_ARV3_050_POND_TYP	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	2.08E-02	1.13E-02	1.85E-04	6.99E-05	4.15E-01	1.21E-03	1.13E-01	8.68E-01
G_ERV1_050_POND_TYP	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.45E-01
G_ERV2_050_POND_TYP	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.46E-01
G_ERV3_050_POND_TYP	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.46E-01
G_RGV1_050_POND_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.46E-01
G_RGV2_050_POND_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.45E-01
G_RGV3_050_POND_TYP	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.45E-01
G_SLV1_050_POND_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.45E-01

TABLE B-16 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Pond

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
SURFACE RUNOFF - Modeled in GLEAMS - TYPICAL APPLICATION RATE															
G_SLV2_050_POND_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.45E-01
G_SLV3_050_POND_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.46E-01
G_STV1_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	4.23E-02	1.82E-02	3.78E-04	1.42E-04	8.46E-01	1.96E-03	1.82E-01	1.40E+00
G_STV2_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt	3.76E-02	1.61E-02	3.35E-04	1.26E-04	7.51E-01	1.73E-03	1.61E-01	1.24E+00
G_STV3_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	7.38E-02	1.70E-02	6.59E-04	2.48E-04	1.48E+00	1.83E-03	1.70E-01	1.31E+00
G_VGV1_050_POND_TYP	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.46E-01
G_VGV2_050_POND_TYP	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	1.71E-02	1.10E-02	1.53E-04	5.76E-05	3.42E-01	1.18E-03	1.10E-01	8.46E-01
G_VGV3_050_POND_TYP	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	1.12E-02	6.20E-03	9.98E-05	3.76E-05	2.24E-01	6.66E-04	6.20E-02	4.77E-01
MAXIMUM APPLICATION RATE															
G_BASE_SAND_005_POND_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_POND_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_POND_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_POND_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Sand	1.13E+00	1.02E+00	1.01E-02	3.81E-03	2.26E+01	1.10E-01	1.02E+01	7.86E+01
G_BASE_CLAY_010_POND_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Clay	1.61E-02	2.83E-03	1.44E-04	5.42E-05	3.22E-01	3.05E-04	2.83E-02	2.18E-01
G_BASE_LOAM_010_POND_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Loam	1.88E-03	1.65E-03	1.68E-05	6.34E-06	3.76E-02	1.77E-04	1.65E-02	1.27E-01
G_BASE_SAND_025_POND_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Sand	1.41E-01	3.26E-02	1.26E-03	4.74E-04	2.82E+00	3.51E-03	3.26E-01	2.51E+00
G_BASE_CLAY_025_POND_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Clay	2.98E-01	1.36E-01	2.66E-03	1.00E-03	5.97E+00	1.47E-02	1.36E+00	1.05E+01

TABLE B-16 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Pond

SURFACE RUNOFF - Modeled in GLEAMS - MAXIMUM APPLICATION RATE

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients[1] - Acute			Risk Quotients[1] - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_BASE_LOAM_025_POND_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Loam	2.94E-01	2.73E-01	2.63E-03	9.91E-04	5.89E+00	2.93E-02	2.73E+00	2.10E+01
G_BASE_SAND_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Sand	8.16E-01	1.73E-01	7.28E-03	2.75E-03	1.63E+01	1.86E-02	1.73E+00	1.33E+01
G_BASE_CLAY_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Clay	1.03E+00	1.39E-01	9.17E-03	3.46E-03	2.05E+01	1.49E-02	1.39E+00	1.07E+01
G_BASE_LOAM_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.37E-01	8.80E-02	1.22E-03	4.61E-04	2.74E+00	9.46E-03	8.80E-01	6.77E+00
G_BASE_SAND_100_POND_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Sand	7.92E-01	3.26E-01	7.08E-03	2.67E-03	1.58E+01	3.51E-02	3.26E+00	2.51E+01
G_BASE_CLAY_100_POND_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Clay	5.31E-01	7.61E-02	4.74E-03	1.79E-03	1.06E+01	8.18E-03	7.61E-01	5.86E+00
G_BASE_LOAM_100_POND_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.09E-01	1.33E-02	9.75E-04	3.68E-04	2.18E+00	1.42E-03	1.33E-01	1.02E+00
G_BASE_SAND_150_POND_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Sand	7.22E-01	2.47E-01	6.45E-03	2.43E-03	1.44E+01	2.65E-02	2.47E+00	1.90E+01
G_BASE_CLAY_150_POND_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Clay	2.32E-01	5.80E-02	2.07E-03	7.82E-04	4.64E+00	6.23E-03	5.80E-01	4.46E+00
G_BASE_LOAM_150_POND_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Loam	2.13E-01	3.49E-02	1.90E-03	7.18E-04	4.26E+00	3.75E-03	3.49E-01	2.68E+00
G_BASE_SAND_200_POND_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Sand	6.54E-01	1.56E-01	5.84E-03	2.20E-03	1.31E+01	1.68E-02	1.56E+00	1.20E+01
G_BASE_CLAY_200_POND_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Clay	2.47E-01	4.93E-02	2.21E-03	8.32E-04	4.94E+00	5.30E-03	4.93E-01	3.79E+00
G_BASE_LOAM_200_POND_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Loam	2.34E-01	5.26E-02	2.09E-03	7.88E-04	4.68E+00	5.65E-03	5.26E-01	4.04E+00
G_BASE_SAND_250_POND_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Sand	6.48E-01	9.63E-02	5.79E-03	2.18E-03	1.30E+01	1.04E-02	9.63E-01	7.41E+00
G_BASE_CLAY_250_POND_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Clay	3.28E-01	4.40E-02	2.93E-03	1.11E-03	6.57E+00	4.73E-03	4.40E-01	3.38E+00
G_BASE_LOAM_250_POND_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Loam	2.37E-01	6.34E-02	2.11E-03	7.97E-04	4.74E+00	6.81E-03	6.34E-01	4.87E+00
G_ARV1_050_POND_MAX	50	1	0.05	0.015	0.401	Weeds (78)	Loam	9.62E-02	8.40E-02	8.59E-04	3.24E-04	1.92E+00	9.03E-03	8.40E-01	6.46E+00

TABLE B-16 (Cont.)

Potential Risks to Aquatic Species From Surface Runoff to Pond

SURFACE RUNOFF - Modeled in GLEAMS - MAXIMUM APPLICATION RATE

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients[1] – Acute			Risk Quotients[1] - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_ARV2_050_POND_MAX	50	100	0.05	0.015	0.401	Weeds (78)	Loam	1.47E-01	8.99E-02	1.31E-03	4.95E-04	2.94E+00	9.67E-03	8.99E-01	6.92E+00
G_ARV3_050_POND_MAX	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.66E-01	9.03E-02	1.48E-03	5.59E-04	3.32E+00	9.71E-03	9.03E-01	6.95E+00
G_ERV1_050_POND_MAX	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.37E-01	8.79E-02	1.22E-03	4.61E-04	2.74E+00	9.45E-03	8.79E-01	6.76E+00
G_ERV2_050_POND_MAX	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.37E-01	8.80E-02	1.22E-03	4.61E-04	2.74E+00	9.46E-03	8.80E-01	6.77E+00
G_ERV3_050_POND_MAX	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.37E-01	8.80E-02	1.22E-03	4.61E-04	2.74E+00	9.46E-03	8.80E-01	6.77E+00
G_RGV1_050_POND_MAX	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.37E-01	8.80E-02	1.22E-03	4.61E-04	2.74E+00	9.46E-03	8.80E-01	6.77E+00
G_RGV2_050_POND_MAX	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.37E-01	8.79E-02	1.22E-03	4.61E-04	2.74E+00	9.45E-03	8.79E-01	6.76E+00
G_RGV3_050_POND_MAX	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.37E-01	8.79E-02	1.22E-03	4.61E-04	2.74E+00	9.45E-03	8.79E-01	6.76E+00
G_SLV1_050_POND_MAX	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.37E-01	8.79E-02	1.22E-03	4.61E-04	2.74E+00	9.45E-03	8.79E-01	6.76E+00
G_SLV2_050_POND_MAX	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.37E-01	8.79E-02	1.22E-03	4.61E-04	2.74E+00	9.45E-03	8.79E-01	6.76E+00
G_SLV3_050_POND_MAX	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.37E-01	8.80E-02	1.22E-03	4.61E-04	2.74E+00	9.46E-03	8.80E-01	6.77E+00
G_STV1_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	3.39E-01	1.46E-01	3.02E-03	1.14E-03	6.77E+00	1.57E-02	1.46E+00	1.12E+01
G_STV2_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Silt	3.01E-01	1.29E-01	2.68E-03	1.01E-03	6.01E+00	1.39E-02	1.29E+00	9.93E+00
G_STV3_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	5.90E-01	1.36E-01	5.27E-03	1.99E-03	1.18E+01	1.47E-02	1.36E+00	1.05E+01
G_VGV1_050_POND_MAX	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.37E-01	8.80E-02	1.22E-03	4.61E-04	2.74E+00	9.46E-03	8.80E-01	6.77E+00
G_VGV3_050_POND_MAX	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	8.94E-02	4.96E-02	7.99E-04	3.01E-04	1.79E+00	5.33E-03	4.96E-01	3.81E+00

[1]Risk Quotient = Estimated Dose/Toxicity Reference Value.
[2]USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.

TABLE B-17

Potential Risks to Aquatic Species from Surface Runoff to Stream

SURFACE RUNOFF - Modeled in GLEAMS – TYPICAL APPLICATION RATE

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac/EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients - Acute			Risk Quotients - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants
G_BASE_SAND_005 _STREAM_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005 _STREAM_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005 _STREAM_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010 _STREAM_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	5.64E-03	7.98E-05	5.03E-05	1.90E-05	1.13E-01	8.58E-06	7.98E-04	6.14E-03
G_BASE_CLAY_010 _STREAM_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	6.50E-05	5.47E-07	5.80E-07	2.19E-07	1.30E-03	5.88E-08	5.47E-06	4.20E-05
G_BASE_LOAM_010 _STREAM_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	5.14E-06	1.03E-07	4.58E-08	1.73E-08	1.03E-04	1.10E-08	1.03E-06	7.89E-06
G_BASE_SAND_025 _STREAM_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	7.21E-04	2.12E-05	6.44E-06	2.43E-06	1.44E-02	2.28E-06	2.12E-04	1.63E-03
G_BASE_CLAY_025 _STREAM_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	8.73E-04	4.34E-05	7.79E-06	2.94E-06	1.75E-02	4.67E-06	4.34E-04	3.34E-03
G_BASE_LOAM_025 _STREAM_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	2.75E-03	1.02E-04	2.46E-05	9.26E-06	5.50E-02	1.10E-05	1.02E-03	7.88E-03
G_BASE_SAND_050 _STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	8.42E-03	2.34E-04	7.52E-05	2.84E-05	1.68E-01	2.52E-05	2.34E-03	1.80E-02
G_BASE_CLAY_050 _STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	4.55E-03	1.42E-04	4.06E-05	1.53E-05	9.10E-02	1.53E-05	1.42E-03	1.09E-02
G_BASE_LOAM_050 _STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.87E-03	9.40E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.40E-04	7.23E-03
G_BASE_SAND_100 _STREAM_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	6.43E-03	4.48E-04	5.74E-05	2.16E-05	1.29E-01	4.82E-05	4.48E-03	3.45E-02
G_BASE_CLAY_100 _STREAM_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	9.29E-03	1.92E-04	8.29E-05	3.13E-05	1.86E-01	2.06E-05	1.92E-03	1.48E-02
G_BASE_LOAM_100 _STREAM_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.32E-03	3.50E-05	1.18E-05	4.43E-06	2.63E-02	3.76E-06	3.50E-04	2.69E-03
G_BASE_SAND_150 _STREAM_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	1.17E-02	4.40E-04	1.04E-04	3.93E-05	2.34E-01	4.73E-05	4.40E-03	3.38E-02
G_BASE_CLAY_150 _STREAM_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	8.63E-03	1.87E-04	7.71E-05	2.91E-05	1.73E-01	2.01E-05	1.87E-03	1.44E-02

TABLE B-17 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Stream

SURFACE RUNOFF - Modeled in GLEAMS – TYPICAL APPLICATION RATE

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac/EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients - Acute			Risk Quotients - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants
G_BASE_LOAM_150_STREAM_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	2.88E-03	1.09E-04	2.57E-05	9.70E-06	5.76E-02	1.18E-05	1.09E-03	8.41E-03
G_BASE_SAND_200_STREAM_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	1.34E-02	4.15E-04	1.19E-04	4.49E-05	2.67E-01	4.46E-05	4.15E-03	3.19E-02
G_BASE_CLAY_200_STREAM_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	7.16E-03	1.75E-04	6.39E-05	2.41E-05	1.43E-01	1.88E-05	1.75E-03	1.35E-02
G_BASE_LOAM_200_STREAM_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	3.45E-03	1.86E-04	3.08E-05	1.16E-05	6.90E-02	2.00E-05	1.86E-03	1.43E-02
G_BASE_SAND_250_STREAM_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	1.30E-02	3.89E-04	1.16E-04	4.37E-05	2.60E-01	4.18E-05	3.89E-03	2.99E-02
G_BASE_CLAY_250_STREAM_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	5.84E-03	1.65E-04	5.21E-05	1.96E-05	1.17E-01	1.78E-05	1.65E-03	1.27E-02
G_BASE_LOAM_250_STREAM_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	3.56E-03	2.42E-04	3.18E-05	1.20E-05	7.13E-02	2.61E-05	2.42E-03	1.87E-02
G_ARV1_050_STREAM_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	2.64E-04	1.07E-05	2.36E-06	8.88E-07	5.28E-03	1.15E-06	1.07E-04	8.20E-04
G_ARV2_050_STREAM_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	6.78E-03	5.49E-04	6.05E-05	2.28E-05	1.36E-01	5.90E-05	5.49E-03	4.22E-02
G_ARV3_050_STREAM_TYP	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.43E-02	1.48E-03	1.28E-04	4.83E-05	2.87E-01	1.59E-04	1.48E-02	1.14E-01
G_ERV1_050_STREAM_TYP	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_ERV2_050_STREAM_TYP	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_ERV3_050_STREAM_TYP	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_RGV1_050_STREAM_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_RGV2_050_STREAM_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_RGV3_050_STREAM_TYP	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_SLV1_050_STREAM_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03

TABLE B-17 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Stream

SURFACE RUNOFF - Modeled in GLEAMS – TYPICAL APPLICATION RATE															
								Stream Concentrations (mg/L)		Risk Quotients - Acute			Risk Quotients - Chronic		
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac/EI)	Vegetation Type	Soil Type	Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants
G_SLV2_050_STREAM_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_SLV3_050_STREAM_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_STV1_050_STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	2.24E-03	1.40E-04	2.00E-05	7.55E-06	4.49E-02	1.51E-05	1.40E-03	1.08E-02
G_STV2_050_STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt	2.14E-03	1.30E-04	1.91E-05	7.22E-06	4.29E-02	1.40E-05	1.30E-03	9.99E-03
G_STV3_050_STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	4.23E-03	1.39E-04	3.78E-05	1.43E-05	8.47E-02	1.50E-05	1.39E-03	1.07E-02
G_VGV1_050_STREAM_TYP	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_VGV2_050_STREAM_TYP	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	1.87E-03	9.39E-05	1.67E-05	6.31E-06	3.75E-02	1.01E-05	9.39E-04	7.22E-03
G_VGV3_050_STREAM_TYP	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	1.27E-03	6.43E-05	1.13E-05	4.26E-06	2.53E-02	6.91E-06	6.43E-04	4.95E-03
MAXIMUM APPLICATION RATE															
G_BASE_SAND_005_STREAM_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_STREAM_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_STREAM_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_STREAM_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Sand	4.51E-02	6.38E-04	4.03E-04	1.52E-04	9.02E-01	6.86E-05	6.38E-03	4.91E-02
G_BASE_CLAY_010_STREAM_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Clay	5.20E-04	4.37E-06	4.64E-06	1.75E-06	1.04E-02	4.70E-07	4.37E-05	3.36E-04
G_BASE_LOAM_010_STREAM_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Loam	4.11E-05	8.21E-07	3.67E-07	1.38E-07	8.22E-04	8.83E-08	8.21E-06	6.31E-05
G_BASE_SAND_025_STREAM_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Sand	5.77E-03	1.70E-04	5.15E-05	1.94E-05	1.15E-01	1.82E-05	1.70E-03	1.30E-02
G_BASE_CLAY_025_STREAM_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Clay	6.98E-03	3.48E-04	6.23E-05	2.35E-05	1.40E-01	3.74E-05	3.48E-03	2.67E-02

TABLE B-17 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Stream

SURFACE RUNOFF - Modeled in GLEAMS
MAXIMUM APPLICATION RATE

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac/EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients - Acute			Risk Quotients - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants
G_BASE_LOAM_025_STREAM_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Loam	2.20E-02	8.19E-04	1.96E-04	7.41E-05	4.40E-01	8.81E-05	8.19E-03	6.30E-02
G_BASE_SAND_050_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Sand	6.74E-02	1.87E-03	6.01E-04	2.27E-04	1.35E+00	2.01E-04	1.87E-02	1.44E-01
G_BASE_CLAY_050_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Clay	3.64E-02	1.14E-03	3.25E-04	1.23E-04	7.28E-01	1.22E-04	1.14E-02	8.75E-02
G_BASE_LOAM_050_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.50E-02	7.52E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.52E-03	5.78E-02
G_BASE_SAND_100_STREAM_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Sand	5.14E-02	3.59E-03	4.59E-04	1.73E-04	1.03E+00	3.86E-04	3.59E-02	2.76E-01
G_BASE_CLAY_100_STREAM_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Clay	7.43E-02	1.54E-03	6.64E-04	2.50E-04	1.49E+00	1.65E-04	1.54E-02	1.18E-01
G_BASE_LOAM_100_STREAM_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.05E-02	2.80E-04	9.41E-05	3.55E-05	2.11E-01	3.01E-05	2.80E-03	2.15E-02
G_BASE_SAND_150_STREAM_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Sand	9.34E-02	3.52E-03	8.34E-04	3.15E-04	1.87E+00	3.78E-04	3.52E-02	2.71E-01
G_BASE_CLAY_150_STREAM_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Clay	6.90E-02	1.50E-03	6.16E-04	2.32E-04	1.38E+00	1.61E-04	1.50E-02	1.15E-01
G_BASE_LOAM_150_STREAM_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Loam	2.30E-02	8.74E-04	2.06E-04	7.76E-05	4.61E-01	9.40E-05	8.74E-03	6.73E-02
G_BASE_SAND_200_STREAM_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Sand	1.07E-01	3.32E-03	9.54E-04	3.60E-04	2.14E+00	3.57E-04	3.32E-02	2.55E-01
G_BASE_CLAY_200_STREAM_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Clay	5.73E-02	1.40E-03	5.11E-04	1.93E-04	1.15E+00	1.50E-04	1.40E-02	1.08E-01
G_BASE_LOAM_200_STREAM_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Loam	2.76E-02	1.49E-03	2.47E-04	9.30E-05	5.52E-01	1.60E-04	1.49E-02	1.14E-01
G_BASE_SAND_250_STREAM_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Sand	1.04E-01	3.11E-03	9.27E-04	3.49E-04	2.08E+00	3.35E-04	3.11E-02	2.39E-01
G_BASE_CLAY_250_STREAM_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Clay	4.67E-02	1.32E-03	4.17E-04	1.57E-04	9.34E-01	1.42E-04	1.32E-02	1.02E-01
G_BASE_LOAM_250_STREAM_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Loam	2.85E-02	1.94E-03	2.54E-04	9.60E-05	5.70E-01	2.09E-04	1.94E-02	1.49E-01
G_ARV1_050_STREAM_MAX	50	1	0.05	0.015	0.401	Weeds (78)	Loam	2.11E-03	8.53E-05	1.88E-05	7.11E-06	4.22E-02	9.17E-06	8.53E-04	6.56E-03

TABLE B-17 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Stream

SURFACE RUNOFF - Modeled in GLEAMS – MAXIMUM APPLICATION RATE

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[2] Soil Erodibility Factor (ton/ac/EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients - Acute			Risk Quotients - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants	Fish	Aquatic Inverte-brates	Non-Target Aquatic Plants
G_ARV2_050_STREAM_MAX	50	100	0.05	0.015	0.401	Weeds (78)	Loam	5.42E-02	4.39E-03	4.84E-04	1.83E-04	1.08E+00	4.72E-04	4.39E-02	3.38E-01
G_ARV3_050_STREAM_MAX	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.15E-01	1.18E-02	1.02E-03	3.86E-04	2.30E+00	1.27E-03	1.18E-01	9.10E-01
G_ERV1_050_STREAM_MAX	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_ERV2_050_STREAM_MAX	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_ERV3_050_STREAM_MAX	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_RGV1_050_STREAM_MAX	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_RGV2_050_STREAM_MAX	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_RGV3_050_STREAM_MAX	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_SLV1_050_STREAM_MAX	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_SLV2_050_STREAM_MAX	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_SLV3_050_STREAM_MAX	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_STV1_050_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	1.79E-02	1.12E-03	1.60E-04	6.04E-05	3.59E-01	1.21E-04	1.12E-02	8.64E-02
G_STV2_050_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Silt	1.71E-02	1.04E-03	1.53E-04	5.77E-05	3.43E-01	1.12E-04	1.04E-02	7.99E-02
G_STV3_050_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	3.39E-02	1.11E-03	3.02E-04	1.14E-04	6.77E-01	1.20E-04	1.11E-02	8.58E-02
G_VGV1_050_STREAM_MAX	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_VGV2_050_STREAM_MAX	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	1.50E-02	7.51E-04	1.34E-04	5.05E-05	3.00E-01	8.08E-05	7.51E-03	5.78E-02
G_VGV3_050_STREAM_MAX	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	1.01E-02	5.14E-04	9.04E-05	3.41E-05	2.03E-01	5.53E-05	5.14E-03	3.96E-02

[1]RQ = Risk Quotient = Estimated Dose/Toxicity Reference Value.
[2]USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.

TABLE B-18

Potential Risks to Non-Target Terrestrial Plants from Surface Runoff

SURFACE RUNOFF - Modeled in GLEAMS - TYPICAL APPLICATION RATE										
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[1] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Terrestrial Concentration (lb/acre)	Typical Species RQ[2]	Rare, Threatened, and Endangered Species RQ[2]
G_BASE_SAND_005_TERR_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_TERR_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_TERR_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_TERR_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_010_TERR_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	6.56E-05	1.09E-05	6.56E-03
G_BASE_LOAM_010_TERR_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	3.49E-07	5.81E-08	3.49E-05
G_BASE_SAND_025_TERR_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_025_TERR_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	8.60E-04	1.43E-04	8.60E-02
G_BASE_LOAM_025_TERR_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	1.04E-06	1.73E-07	1.04E-04
G_BASE_SAND_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	4.97E-03	8.29E-04	4.97E-01
G_BASE_LOAM_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.57E-04	2.62E-05	1.57E-02
G_BASE_SAND_100_TERR_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	6.37E-11	1.06E-11	6.37E-09
G_BASE_CLAY_100_TERR_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	1.27E-02	2.12E-03	1.27E+00
G_BASE_LOAM_100_TERR_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	2.09E-04	3.48E-05	2.09E-02
G_BASE_SAND_150_TERR_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_150_TERR_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	1.43E-02	2.39E-03	1.43E+00
G_BASE_LOAM_150_TERR_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	2.08E-04	3.46E-05	2.08E-02
G_BASE_SAND_200_TERR_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_200_TERR_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	1.37E-02	2.29E-03	1.37E+00
G_BASE_LOAM_200_TERR_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	1.53E-04	2.55E-05	1.53E-02
G_BASE_SAND_250_TERR_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_250_TERR_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	1.24E-02	2.06E-03	1.24E+00

TABLE B-18 (Cont.)

Potential Risks to Non-Target Terrestrial Plants From Surface Runoff

SURFACE RUNOFF - modeled in GLEAMS TYPICAL APPLICATION RATE										
GLEAMS ID	**Annual Precipitation (inches)**	**Application Area (acres)**	**Hydraulic Slope (ft/ft)**	**Surface Roughness**	**USLE[1] Soil Erodibility Factor (ton/ ac per EI)**	**Vegetation Type**	**Soil Type**	**Terrestrial Concentration (lb/acre)**	**Typical Species RQ[2]**	**Rare, Threatened, and Endangered Species RQ[2]**
G_BASE_LOAM_250_TERR_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	1.05E-04	1.74E-05	1.05E-02
G_ARV1_050_TERR_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	1.54E-04	2.57E-05	1.54E-02
G_ARV2_050_TERR_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	1.54E-04	2.57E-05	1.54E-02
G_ARV3_050_TERR_TYP	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.54E-04	2.57E-05	1.54E-02
G_ERV1_050_TERR_TYP	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.54E-04	2.57E-05	1.54E-02
G_ERV2_050_TERR_TYP	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.55E-04	2.58E-05	1.55E-02
G_ERV3_050_TERR_TYP	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.57E-04	2.61E-05	1.57E-02
G_RGV1_050_TERR_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.55E-04	2.58E-05	1.55E-02
G_RGV2_050_TERR_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.54E-04	2.57E-05	1.54E-02
G_RGV3_050_TERR_TYP	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.54E-04	2.56E-05	1.54E-02
G_SLV1_050_TERR_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.54E-04	2.56E-05	1.54E-02
G_SLV2_050_TERR_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.54E-04	2.57E-05	1.54E-02
G_SLV3_050_TERR_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.56E-04	2.60E-05	1.56E-02
G_STV1_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	1.75E-03	2.92E-04	1.75E-01
G_STV2_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt	1.67E-03	2.78E-04	1.67E-01
G_STV3_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	4.28E-03	7.13E-04	4.28E-01
G_VGV1_050_TERR_TYP	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.55E-04	2.58E-05	1.55E-02
G_VGV2_050_TERR_TYP	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	1.55E-04	2.58E-05	1.55E-02
G_VGV3_050_TERR_TYP	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	2.04E-04	3.39E-05	2.04E-02
MAXIMUM APPLICATION RATE										
G_BASE_SAND_005_TERR_max	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_TERR_max	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00

TABLE B-18 (Cont.)

Potential Risks to Non-Target Terrestrial Plants From Surface Runoff

SURFACE RUNOFF - Modeled in GLEAMS – MAXIMUM APPLICATION RATE										
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[1] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Terrestrial Concentration (lb/acre)	Typical Species RQ[2]	Rare, Threatened, and Endangered Species RQ[2]
G_BASE_LOAM_005_TERR_max	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_TERR_max	10	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_010_TERR_max	10	10	0.05	0.015	0.401	Weeds (78)	Clay	5.25E-04	8.75E-05	5.25E-02
G_BASE_LOAM_010_TERR_max	10	10	0.05	0.015	0.401	Weeds (78)	Loam	2.79E-06	4.65E-07	2.79E-04
G_BASE_SAND_025_TERR_max	25	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_025_TERR_max	25	10	0.05	0.015	0.401	Weeds (78)	Clay	6.88E-03	1.15E-03	6.88E-01
G_BASE_LOAM_025_TERR_max	25	10	0.05	0.015	0.401	Weeds (78)	Loam	8.33E-06	1.39E-06	8.33E-04
G_BASE_SAND_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay	3.98E-02	6.63E-03	3.98E+00
G_BASE_LOAM_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.26E-03	2.10E-04	1.26E-01
G_BASE_SAND_100_TERR_max	100	10	0.05	0.015	0.401	Weeds (78)	Sand	5.10E-10	8.50E-11	5.10E-08
G_BASE_CLAY_100_TERR_max	100	10	0.05	0.015	0.401	Weeds (78)	Clay	1.02E-01	1.69E-02	1.02E+01
G_BASE_LOAM_100_TERR_max	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.67E-03	2.79E-04	1.67E-01
G_BASE_SAND_150_TERR_max	150	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_150_TERR_max	150	10	0.05	0.015	0.401	Weeds (78)	Clay	1.15E-01	1.91E-02	1.15E+01
G_BASE_LOAM_150_TERR_max	150	10	0.05	0.015	0.401	Weeds (78)	Loam	1.66E-03	2.77E-04	1.66E-01
G_BASE_SAND_200_TERR_max	200	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_200_TERR_max	200	10	0.05	0.015	0.401	Weeds (78)	Clay	1.10E-01	1.83E-02	1.10E+01
G_BASE_LOAM_200_TERR_max	200	10	0.05	0.015	0.401	Weeds (78)	Loam	1.23E-03	2.04E-04	1.23E-01
G_BASE_SAND_250_TERR_max	250	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_250_TERR_max	250	10	0.05	0.015	0.401	Weeds (78)	Clay	9.89E-02	1.65E-02	9.89E+00
G_BASE_LOAM_250_TERR_max	250	10	0.05	0.015	0.401	Weeds (78)	Loam	8.37E-04	1.40E-04	8.37E-02
G_ARV1_050_TERR_max	50	1	0.05	0.015	0.401	Weeds (78)	Loam	1.24E-03	2.06E-04	1.24E-01

TABLE B-18 (Cont.)

Potential Risks to Non-Target Terrestrial Plants from Surface Runoff

SURFACE RUNOFF - Modeled in GLEAMS - MAXIMUM APPLICATION RATE										
GLEAMS ID	**Annual Precipitation (inches)**	**Application Area (acres)**	**Hydraulic Slope (ft/ft)**	**Surface Roughness**	**USLE[1] Soil Erodibility Factor (ton/ac per EI)**	**Vegetation Type**	**Soil Type**	**Terrestrial Concentration (lb/acre)**	**Typical Species RQ[2]**	**Rare, Threatened, and Endangered Species RQ[2]**
G_ARV2_050_TERR_max	50	100	0.05	0.015	0.401	Weeds (78)	Loam	1.24E-03	2.06E-04	1.24E-01
G_ARV3_050_TERR_max	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.23E-03	2.06E-04	1.23E-01
G_ERV1_050_TERR_max	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.23E-03	2.05E-04	1.23E-01
G_ERV2_050_TERR_max	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.24E-03	2.06E-04	1.24E-01
G_ERV3_050_TERR_max	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.25E-03	2.09E-04	1.25E-01
G_RGV1_050_TERR_max	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.24E-03	2.06E-04	1.24E-01
G_RGV2_050_TERR_max	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.24E-03	2.06E-04	1.24E-01
G_RGV3_050_TERR_max	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.23E-03	2.05E-04	1.23E-01
G_SLV1_050_TERR_max	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.23E-03	2.05E-04	1.23E-01
G_SLV2_050_TERR_max	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.23E-03	2.05E-04	1.23E-01
G_SLV3_050_TERR_max	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.25E-03	2.08E-04	1.25E-01
G_STV1_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	1.40E-02	2.33E-03	1.40E+00
G_STV2_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt	1.34E-02	2.23E-03	1.34E+00
G_STV3_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	3.42E-02	5.70E-03	3.42E+00
G_VGV1_050_TERR_max	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.24E-03	2.06E-04	1.24E-01
G_VGV2_050_TERR_max	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	1.24E-03	2.06E-04	1.24E-01
G_VGV3_050_TERR_max	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	1.63E-03	2.71E-04	1.63E-01

[1]USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.
[2]RQ = Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-19

Potential Risk to Predatory Bird From Long-term Consumption of Contaminated Fish from Pond (Pond Impacted by Surface Runoff Modeled in GLEAMS)

Parameters/ Assumptions	Value	Units
Body weight (BW)	5.15	kg
Food ingestion rate (dry weight [dw]) [1]	0.1018	kg dw/day
Food ingestion rate (wet weight [ww])(ir) [2]	0.4072	kg ww/day
Bioconcentration factor (BCF)	2.63	L/kg fish
Proportion of diet contaminated (PC)	1	unitless
Toxicity reference value (TRV) [3]	1,000	mg/kg-bw/day

TYPICAL APPLICATION RATE											
GLEAMS ID	**Annual Precipitation (inches)**	**Application Area (acres)**	**Hydraulic Slope (ft/ft)**	**Surface Roughness**	**USLE[4] Soil Erodibility Factor (ton/ac per EI)**	**Vegetation Type**	**Soil Type**	**Pond Concentration (C_{pond} mg/L)**	**Concentrations in fish (C_{Fish}): C_{pond} × BCF**	**Dose estimates (D): (C_{Fish} × ir × PC) / BW**	**Risk Quotient[5]**
G_BASE_SAND_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	1.28E-01	3.36E-01	2.65E-02	2.65E-05
G_BASE_CLAY_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	3.54E-04	9.32E-04	7.37E-05	7.37E-08
G_BASE_LOAM_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	2.06E-04	5.42E-04	4.29E-05	4.29E-08
G_BASE_SAND_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	4.08E-03	1.07E-02	8.48E-04	8.48E-07
G_BASE_CLAY_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	1.70E-02	4.48E-02	3.54E-03	3.54E-06

TABLE B-19 (Cont.)

Potential Risk to Predatory Bird From Long-Term Consumption of Contaminated Fish From Pond (Pond Impacted by Surface Runoff Modeled in GLEAMS)

TYPICAL APPLICATION RATE											
GLEAMS ID	**Annual Precipitation (inches)**	**Application Area (acres)**	**Hydraulic Slope (ft/ft)**	**Surface Roughness**	**USLE[4] Soil Erodibility Factor (ton/ ac per EI)**	**Vegetation Type**	**Soil Type**	**Pond Concentration (C_{pond} mg/L)**	**Concentrations in fish (C_{Fish}): C_{pond} × BCF**	**Dose estimates (D): (C_{Fish} × ir × PC) / BW**	**Risk Quotient[5]**
G_BASE_LOAM_025 _POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	3.41E-02	8.97E-02	7.09E-03	7.09E-06
G_BASE_SAND_050_ POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	2.16E-02	5.69E-02	4.50E-03	4.50E-06
G_BASE_CLAY_050_ POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	1.73E-02	4.56E-02	3.60E-03	3.60E-06
G_BASE_LOAM_050 _POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_BASE_SAND_100_ POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	4.08E-02	1.07E-01	8.47E-03	8.47E-06
G_BASE_CLAY_100_ POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	9.52E-03	2.50E-02	1.98E-03	1.98E-06
G_BASE_LOAM_100 _POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.66E-03	4.36E-03	3.44E-04	3.44E-07
G_BASE_SAND_150_ POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	3.08E-02	8.11E-02	6.41E-03	6.41E-06
G_BASE_CLAY_150_ POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	7.25E-03	1.91E-02	1.51E-03	1.51E-06
G_BASE_LOAM_150 _POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	4.36E-03	1.15E-02	9.06E-04	9.06E-07
G_BASE_SAND_200_ POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	1.95E-02	5.13E-02	4.06E-03	4.06E-06
G_BASE_CLAY_200_ POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	6.17E-03	1.62E-02	1.28E-03	1.28E-06
G_BASE_LOAM_200 _POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	6.57E-03	1.73E-02	1.37E-03	1.37E-06
G_BASE_SAND_250_ POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	1.20E-02	3.17E-02	2.50E-03	2.50E-06
G_BASE_CLAY_250_ POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	5.50E-03	1.45E-02	1.14E-03	1.14E-06
G_BASE_LOAM_250 _POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	7.92E-03	2.08E-02	1.65E-03	1.65E-06

TABLE B-19 (Cont.)

Potential Risk to Predatory Bird From Long-Term Consumption of Contaminated Fish From Pond (Pond Impacted by Surface Runoff Modeled in GLEAMS)

TYPICAL APPLICATION RATE											
GLEAMS ID	**Annual Precipitation (inches)**	**Application Area (acres)**	**Hydraulic Slope (ft/ft)**	**Surface Roughness**	**USLE[4] Soil Erodibility Factor (ton/ ac per EI)**	**Vegetation Type**	**Soil Type**	**Pond Concentration (C_{pond} mg/L)**	**Concentrations in fish (C_{Fish}): C_{pond} × BCF**	**Dose estimates (D): (C_{Fish} × ir × PC) / BW**	**Risk Quotient[5]**
G_ARV1_050_POND_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	1.05E-02	2.76E-02	2.18E-03	2.18E-06
G_ARV2_050_POND_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	1.12E-02	2.96E-02	2.34E-03	2.34E-06
G_ARV3_050_POND_TYP	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.13E-02	2.97E-02	2.35E-03	2.35E-06
G_ERV1_050_POND_TYP	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_ERV2_050_POND_TYP	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_ERV3_050_POND_TYP	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_RGV1_050_POND_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_RGV2_050_POND_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_RGV3_050_POND_TYP	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_SLV1_050_POND_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_SLV2_050_POND_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_SLV3_050_POND_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_STV1_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	1.82E-02	4.80E-02	3.79E-03	3.79E-06
G_STV2_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt	1.61E-02	4.24E-02	3.35E-03	3.35E-06
G_STV3_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	1.70E-02	4.48E-02	3.54E-03	3.54E-06
G_VGV1_050_POND_TYP	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06

TABLE B-19 (Cont.)

Potential Risk to Predatory Bird from Long-term Consumption of Contaminated Fish from Pond (Pond Impacted by Surface Runoff Modeled in GLEAMS)

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[4] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (C_{pond} mg/L)	Concentrations in fish (C_{Fish}): C_{pond} × BCF	Dose estimates (D): (C_{Fish} × ir × PC) / BW	Risk Quotient[5]
TYPICAL APPLICATION RATE											
G_VGV2_050_POND_TYP	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	1.10E-02	2.89E-02	2.29E-03	2.29E-06
G_VGV3_050_POND_TYP	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	6.20E-03	1.63E-02	1.29E-03	1.29E-06
MAXIMUM APPLICATION RATE											
G_BASE_SAND_005_POND_max	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_POND_max	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_POND_max	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_POND_max	10	10	0.05	0.015	0.401	Weeds (78)	Sand	1.02E+00	2.69E+00	2.12E-01	2.12E-04
G_BASE_CLAY_010_POND_max	10	10	0.05	0.015	0.401	Weeds (78)	Clay	2.83E-03	7.45E-03	5.89E-04	5.89E-07
G_BASE_LOAM_010_POND_max	10	10	0.05	0.015	0.401	Weeds (78)	Loam	1.65E-03	4.34E-03	3.43E-04	3.43E-07
G_BASE_SAND_025_POND_max	25	10	0.05	0.015	0.401	Weeds (78)	Sand	3.26E-02	8.59E-02	6.79E-03	6.79E-06
G_BASE_CLAY_025_POND_max	25	10	0.05	0.015	0.401	Weeds (78)	Clay	1.36E-01	3.58E-01	2.83E-02	2.83E-05
G_BASE_LOAM_025_POND_max	25	10	0.05	0.015	0.401	Weeds (78)	Loam	2.73E-01	7.17E-01	5.67E-02	5.67E-05
G_BASE_SAND_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Sand	1.73E-01	4.55E-01	3.60E-02	3.60E-05
G_BASE_CLAY_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay	1.39E-01	3.65E-01	2.88E-02	2.88E-05
G_BASE_LOAM_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Loam	8.80E-02	2.31E-01	1.83E-02	1.83E-05
G_BASE_SAND_100_POND_max	100	10	0.05	0.015	0.401	Weeds (78)	Sand	3.26E-01	8.57E-01	6.78E-02	6.78E-05

TABLE B-19 (Cont.)

Potential Risk to Predatory Bird from Long-term Consumption of Contaminated Fish from Pond (Pond Impacted by Surface Runoff Modeled in GLEAMS)

MAXIMUM APPLICATION RATE											
GLEAMS ID	**Annual Precipitation (inches)**	**Application Area (acres)**	**Hydraulic Slope (ft/ft)**	**Surface Roughness**	**USLE[4] Soil Erodibility Factor (ton/ ac per EI)**	**Vegetation Type**	**Soil Type**	**Pond Concentration (C_{pond} mg/L)**	**Concentrations in fish (C_{Fish}): C_{pond} × BCF**	**Dose estimates (D): (C_{Fish} × ir × PC) / BW**	**Risk Quotient[5]**
G_BASE_CLAY_100_POND_max	100	10	0.05	0.015	0.401	Weeds (78)	Clay	7.61E-02	2.00E-01	1.58E-02	1.58E-05
G_BASE_LOAM_100_POND_max	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.33E-02	3.49E-02	2.76E-03	2.76E-06
G_BASE_SAND_150_POND_max	150	10	0.05	0.015	0.401	Weeds (78)	Sand	2.47E-01	6.48E-01	5.13E-02	5.13E-05
G_BASE_CLAY_150_POND_max	150	10	0.05	0.015	0.401	Weeds (78)	Clay	5.80E-02	1.52E-01	1.21E-02	1.21E-05
G_BASE_LOAM_150_POND_max	150	10	0.05	0.015	0.401	Weeds (78)	Loam	3.49E-02	9.17E-02	7.25E-03	7.25E-06
G_BASE_SAND_200_POND_max	200	10	0.05	0.015	0.401	Weeds (78)	Sand	1.56E-01	4.11E-01	3.25E-02	3.25E-05
G_BASE_CLAY_200_POND_max	200	10	0.05	0.015	0.401	Weeds (78)	Clay	4.93E-02	1.30E-01	1.03E-02	1.03E-05
G_BASE_LOAM_200_POND_max	200	10	0.05	0.015	0.401	Weeds (78)	Loam	5.26E-02	1.38E-01	1.09E-02	1.09E-05
G_BASE_SAND_250_POND_max	250	10	0.05	0.015	0.401	Weeds (78)	Sand	9.63E-02	2.53E-01	2.00E-02	2.00E-05
G_BASE_CLAY_250_POND_max	250	10	0.05	0.015	0.401	Weeds (78)	Clay	4.40E-02	1.16E-01	9.14E-03	9.14E-06
G_BASE_LOAM_250_POND_max	250	10	0.05	0.015	0.401	Weeds (78)	Loam	6.34E-02	1.67E-01	1.32E-02	1.32E-05
G_ARV1_050_POND_max	50	1	0.05	0.015	0.401	Weeds (78)	Loam	8.40E-02	2.21E-01	1.75E-02	1.75E-05
G_ARV2_050_POND_max	50	100	0.05	0.015	0.401	Weeds (78)	Loam	8.99E-02	2.36E-01	1.87E-02	1.87E-05
G_ARV3_050_POND_max	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	9.03E-02	2.38E-01	1.88E-02	1.88E-05
G_ERV1_050_POND_max	50	10	0.05	0.015	0.05	Weeds (78)	Loam	8.79E-02	2.31E-01	1.83E-02	1.83E-05
G_ERV2_050_POND_max	50	10	0.05	0.015	0.2	Weeds (78)	Loam	8.80E-02	2.31E-01	1.83E-02	1.83E-05

TABLE B-19 (Cont.)

Potential Risk to Predatory Bird from Long-term Consumption of Contaminated Fish from Pond (Pond Impacted by Surface Runoff Modeled in GLEAMS)

MAXIMUM APPLICATION RATE											
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE[4] Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (C_{pond} mg/L)	Concentrations in fish (C_{Fish}): C_{pond} × BCF	Dose estimates (D): (C_{Fish} × ir × PC) / BW	Risk Quotient[5]
G_ERV3_050_POND_max	50	10	0.05	0.015	0.5	Weeds (78)	Loam	8.80E-02	2.31E-01	1.83E-02	1.83E-05
G_RGV1_050_POND_max	50	10	0.05	0.023	0.401	Weeds (78)	Loam	8.80E-02	2.31E-01	1.83E-02	1.83E-05
G_RGV2_050_POND_max	50	10	0.05	0.046	0.401	Weeds (78)	Loam	8.79E-02	2.31E-01	1.83E-02	1.83E-05
G_RGV3_050_POND_max	50	10	0.05	0.15	0.401	Weeds (78)	Loam	8.79E-02	2.31E-01	1.83E-02	1.83E-05
G_SLV1_050_POND_max	50	10	0.005	0.015	0.401	Weeds (78)	Loam	8.79E-02	2.31E-01	1.83E-02	1.83E-05
G_SLV2_050_POND_max	50	10	0.01	0.015	0.401	Weeds (78)	Loam	8.79E-02	2.31E-01	1.83E-02	1.83E-05
G_SLV3_050_POND_max	50	10	0.1	0.015	0.401	Weeds (78)	Loam	8.80E-02	2.31E-01	1.83E-02	1.83E-05
G_STV1_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	1.46E-01	3.84E-01	3.03E-02	3.03E-05
G_STV2_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt	1.29E-01	3.39E-01	2.68E-02	2.68E-05
G_STV3_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	1.36E-01	3.59E-01	2.84E-02	2.84E-05
G_VGV1_050_POND_max	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	8.80E-02	2.31E-01	1.83E-02	1.83E-05
G_VGV2_050_POND_max	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	8.80E-02	2.31E-01	1.83E-02	1.83E-05
G_VGV3_050_POND_max	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	4.96E-02	1.30E-01	1.03E-02	1.03E-05

[1]Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^0.651.
[2]Assumes fish are 75% water (USEPA 1993; Table 4-1 - value for bony fishes).
[3]Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.
[4]USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.
[5]Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-20

Potential Risks to Non-Target Terrestrial Plants from Herbicide in Dust Deposited From Wind Erosion

WIND EROSION - Modeled in CALPUFF – TYPICAL APPLICATION RATE							
				Typical Species		Rare, Threatened, and Endangered Species	
Cal Puff Scenario ID	Watershed Location	Distance from Receptor (km)	Terrestrial Concentration (lb/acre)	TRV[1]	RQ[2]	TRV[1]	RQ[2]
dust_MT_0.5_typ	MT	0.5	2.69E-06	0.03	8.96E-05	0.01	2.69E-04
dust_MT_5_typ	MT	5	1.52E-06	0.03	5.07E-05	0.01	1.52E-04
dust_MT_50_typ	MT	50	1.82E-10	0.03	6.08E-09	0.01	1.82E-08
dust_OR_0.5_typ	OR	0.5	1.54E-06	0.03	5.13E-05	0.01	1.54E-04
dust_OR_5_typ	OR	5	5.87E-07	0.03	1.96E-05	0.01	5.87E-05
dust_OR_50_typ	OR	50	2.07E-10	0.03	6.88E-09	0.01	2.07E-08
dust_WY_0.5_typ	WY	0.5	3.04E-07	0.03	1.01E-05	0.01	3.04E-05
dust_WY_5_typ	WY	5	2.10E-07	0.03	6.99E-06	0.01	2.10E-05
dust_WY_50_typ	WY	50	5.16E-11	0.03	1.72E-09	0.01	5.16E-09
MAXIMUM APPLICATION RATE							
dust_MT_0.5_max	MT	0.5	2.15E-05	0.03	7.17E-04	0.01	2.15E-03
dust_MT_5_max	MT	5	1.22E-05	0.03	4.06E-04	0.01	1.22E-03
dust_MT_50_max	MT	50	1.64E-09	0.03	5.48E-08	0.01	1.64E-07
dust_OR_0.5_max	OR	0.5	1.23E-05	0.03	4.10E-04	0.01	1.23E-03
dust_OR_5_max	OR	5	4.69E-06	0.03	1.56E-04	0.01	4.69E-04
dust_OR_50_max	OR	50	1.65E-09	0.03	5.51E-08	0.01	1.65E-07
dust_WY_0.5_max	WY	0.5	2.43E-06	0.03	8.11E-05	0.01	2.43E-04
dust_WY_5_max	WY	5	1.68E-06	0.03	5.59E-05	0.01	1.68E-04
dust_WY_50_max	WY	50	4.13E-10	0.03	1.38E-08	0.01	4.13E-08

[1] Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.
[2] Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-21

Potential Risks to Aquatic Species from Accidental Spill to Pond (Acute Exposure)

Parameters/Assumptions	Value	Units
Volume of pond (Vp)	1,011,715	L
Volume of spill (Vspill)		
Truck ($Vspill_t$)	757	L
Amount of spill		
Mass of herbicide in helicopter	130	lb
Herbicide concentration in mixture (Cm)[1]		
Truck mixture (Cm_t)	19,174.30	mg/L

Scenario	Concentrations in water (Cw): Cm × Vspill / Vp	Units	Risk Quotients[2]		
			Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Truck spill into pond	14.35	mg/L	0.1281	4.83E-02	2.87E+02
Helicopter spill into pond	58.28	mg/L	0.5204	1.96E-01	1.17E+03

[1] Based on herbicide mixed for the maximum application rate, where truck spray rate is 25 gallons per acre.
Cm = [application rate x (1/spray rate)] converted from lb/gallon to mg/L.
[2] Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-22

Potential Risks to Aquatic Species From Accidental Direct Spray of Pond and Stream (Acute Exposure)

Parameters/Assumptions	Rate	Value	Units
Pond			
Application rates (R)	Typical	0.5	lb/acre
	Maximum	4	lb/acre
Area of pond (Area)		0.25	acre
Volume of pond (Vol)		1,011,715	L
Mass sprayed on pond (R x Area)	Typical	56,699	mg
	Maximum	453,592	mg
Concentration in pond water (Mass/Volume)	Typical	0.0560	mg/L
	Maximum	0.4483	mg/L
Stream			
Width of stream		2	m
Length of stream impacted by direct spray		636.15	m
Area of stream impacted by spray (Area)		1,272.3	m2
Depth of stream		0.2	m
Instantaneous volume of stream impacted by direct spray (Vol)		254,460	L
Mass sprayed on stream (R x Area)	Typical	0.157	lb
	Maximum	1.258	lb
Mass sprayed on stream - converted to mg	Typical	71,303.530	mg
	Maximum	57,0428.239	mg
Concentration in stream water (Mass/Vol)	Typical	0.2802	mg/L
	Maximum	2.2417	mg/L

Scenario	Application Rate	Concentration in water (mg/L)	Fish	Risk Quotients[1]	
				Aquatic Invertebrates	Non-Target Aquatic Plants
Acute					
Direct spray to pond	Typical application	5.60E-02	5.00E-04	1.89E-04	1.12E+00
	Maximum application	4.48E-01	4.00E-03	1.51E-03	8.97E+00
Direct spray to stream	Typical application	2.80E-01	2.50E-03	9.43E-04	5.60E+00
	Maximum application	2.24E+00	2.00E-02	7.55E-03	4.48E+01
Chronic					
Direct spray to pond	Typical application	5.60E-02	6.03E-03	5.60E-01	4.31E+00
	Maximum application	4.48E-01	4.82E-02	4.48E+00	3.45E+01
Direct spray to stream	Typical application	2.80E-01	3.01E-02	2.80E+00	2.16E+01
	Maximum application	2.24E+00	2.41E-01	2.24E+01	1.72E+02

[1] Risk Quotient = Estimated Dose/Toxicity Reference Value.

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