APPENDIX I. FOOD CHAIN MODELING

I.1 FOOD CHAIN MODELING

The estimation of food chain risks was performed to determine which bioaccumulative ecological chemicals of potential concern (ecoCOPCs) potentially could cause adverse effects to ecological receptors at Fort McClellan. Food chain analyses are performed as another line of evidence along with the abiotic toxicity and background screens.

Food chain risks were not estimated for all 12 sites, but only for sites and media with ecoCOPCs that have bioaccumulative properties. To determine which chemicals have the potential to bioaccumulate, the following criteria were used:

- U.S. Environmental Protection Agency (EPA) Region IV list of bioaccumulative chemicals in soil and sediment
- Bioconcentration factor (BCF) (water to fish) greater than 1 for fish
- Log K_{ow} greater than 4 for organics
- Biotransfer factor (BTF) greater than 1 for inorganics.

Based on these criteria, Table I-1 lists the ecoCOPCs that do not bioaccumulate. The food chain spreadsheets contain the ecoCOPCs that were not indicated as potentially bioaccumulating. However, risks for these chemicals were not estimated. There is potential for this approach to exclude some chemicals with bioaccumulative properties that were not selected as ecoCOPCs. Table I-2 indicates bioaccumulative chemicals detected at Fort McClellan sites that were screened out due either to the abiotic toxicity screen, background screen, or both. The following inorganics have bioaccumulative properties, but were excluded as ecoCOPCs for sediment and surface soil at Fort McClellan: chromium, cobalt, copper, lead, manganese, and zinc. Benzo(g,h,i)perylene, benzo(k)fluoranthene, benzo(a)anthracene, and chrysene are organic chemicals that have bioaccumulative properties, but were excluded as ecoCOPCs for sediment or soil for Fort McClellan. The following inorganics and organics have bioaccumulative properties, but were excluded as ecoCOPCs in surface water at Fort McClellan: aluminum, arsenic, barium, iron, lead, manganese, selenium, zinc, alpha-BHC, delta-BHC, and lindane. Models were not run for media with limited sample sizes ($N \leq 2$) due to the additional uncertainty associated with such limited sample sizes.

I.2 EXPOSURE PATHWAYS

The focus of the food chain evaluation is on the ingestion of food items, as well as surface soil, sediment, and surface water. Risks from each applicable exposure pathway are presented for each bioaccumulative ecoCOPC. Only ecoCOPCs in each medium were evaluated. Thus, if arsenic was an ecoCOPC in surface soil but not surface water, risks were estimated to a receptor for plant ingestion and incidental soil ingestion but not surface water ingestion.

I.3 FOOD CHAIN MODELS

The following discussion presents the methods and assumptions used to calculate the exposure of the short-tailed shrew, Eastern cottontail, white-footed mouse, American robin, American woodcock, red-tailed hawk, and muskrat from the exposure pathways presented in Figure 7-1. These receptors were evaluated in this SERA to be consistent with other ERA evaluations at Fort McClellan (IT 2000b). The white-footed mouse, white-tailed deer, American woodcock, and red-tailed hawk were evaluated in the

previous version of the SERA. These ecological receptors were selected from plant and animal species found in either terrestrial or aquatic habitats at Fort McClellan (ANHP 1994a,b, Auburn University 1979, Gaddy 1984, Mettee and Haynes 1979, and Mount 1986).

Consistent with EPA (1997b) guidance, conservative assumptions were used in the calculations of exposure doses in the absence of site-specific data. The assumptions tend to maximize exposure for each receptor. For instance, it was conservatively assumed that the temporal use factor (TUF) would be 1, indicating that the receptor species spends 12 months a year at these sites and does not migrate. The area use factor (AUF) used in this assessment also is 1, indicating that the receptor species spends 100 percent of the time on each site. The fraction of the chemical in ingested soil/sediment and tissue that is absorbed is assumed to be 100 percent (i.e., gastric absorption factor [GAF] = 100%). It is important to note, especially for exposures through the food chain, that all ecoCOPCs are assumed not to transform or degrade during the period of exposure (i.e., the concentration in the medium of concern remains the same). For all exposures, the maximum detected concentrations were used in accordance with agreements between the Army and EPA Region IV. The dose equations are derived based on equations presented in the *Wildlife Exposure Factor Handbook* (EPA 1993b). The general exposure equations are presented below:

$$Dose_{total} = Dose_{food} + Dose_{water} + Dose_{soil/sediment} \quad (1)$$

where:

$Dose_{total}$	=	Sum of all doses (mg/kg-day)
$Dose_{food}$	=	Average daily dose ingested from food (mg/kg-day)
$Dose_{water}$	=	Average daily dose ingested from surface water (mg/kg-day)
$Dose_{soil/sediment}$	=	Average daily dose ingested from surface soil or sediment (mg/kg-day).

The component doses are derived using the following equations:

$$Dose_{food} = IR_{food} \times C_{food} \times AUF \times TUF \times GAF \quad (2)$$

$$Dose_{water} = IR_{water} \times C_{water} \times AUF \times TUF \times GAF \times CF \quad (3)$$

$$Dose_{soil/sediment} = IR_{soil/sediment} \times C_{soil/sediment} \times AUF \times TUF \times GAF \quad (4)$$

where:

Dose	=	Amount of chemical ingested per day (mg/kg-day)
IR	=	Ingestion rate (kg/kg-day or L/kg-day)
C	=	Estimated concentration (mg/kg or μg/L)
AUF	=	Area use factor (unitless)
TUF	=	Temporal use factor (unitless)
GAF	=	Gastric absorption factor (unitless)
CF	=	Conversion factor (1 mg/1,000 μg).

Additional details about the derivation of terrestrial wildlife doses are presented below.

I.3.1 Mammalian and Avian Omnivores

The diets of the short-tailed shrew, white-footed mouse, and American robin include both animal prey and plants. The animal prey of the receptor species is invertebrates, and for this assessment was

assumed to be earthworms. Earthworms were selected as the representative food item because the earthworm has the greatest potential exposure to chemicals in surface soil, and therefore, the greatest potential for high ecoCOPC concentrations. The shrew and white-footed mouse ingest the vegetative portion (stems) of plants, while the robin ingests the reproductive portion of the plant (fruit). Exposure parameter values for these species are presented in Tables I-3, I-4, and I-5.

No data were available from the direct measurement of ecoCOPC concentrations in plant or earthworm tissue; therefore, soil-to-plant bioconcentration factors (SP) and soil-to-animal bioconcentration factors (BAF_i) for invertebrates were used to estimate these concentrations (Tables I-6 and I-7, respectively). For soil-to-animal BAFs, mean values for invertebrates (earthworms) reported by Sample et al. (1998) were selected. For ecoCOPCs not evaluated by Sample et al. (1998) and Bechtel Jacobs (1998), values compiled in *Risk Assessment Methodology for Loring Air Force Base* (HAZWRAP 1994) were used. HAZWRAP (1994) compiles data from other studies (e.g., plant uptake factors for inorganics presented in Baes et al. 1984). The studies include a variety of relationships, such as soil-to-animal (e.g., soil to earthworm) and animal-to-animal (e.g., earthworm to mammals and birds, and small mammals to hawks). Both empirical and estimated values are documented. Plant values are available for both vegetative and reproductive plant parts. Therefore, the SP_v value for the shrew and white-footed mouse was used to calculate the concentration in vegetative parts for those receptors, while an SP_r value was used to calculate the concentration in reproductive parts for the robin.

The following equation was used to calculate the dose of the ecoCOPCs that the shrew, mouse, and robin could be exposed to from ingestion of earthworms, vegetation, soil, and surface water:

$$Dose_{total} = Dose_{worm} + Dose_{veg} + Dose_{soil} + Dose_{water} \quad (5)$$

The equation for worm intake is:

$$Dose_{worm} = IR_{worm} \times C_{worm} \times AUF \times TUF \times GAF \quad (6)$$

where:

Dose = Amount of chemical ingested per day via the ingestion of earthworms (mg/kg-day)

IR_{worm} = Ingestion rate of worms (kg/kg-day)

C_{worm} = Concentration in worm tissue (mg/kg).

The equation used to estimate the chemical concentration in earthworms is presented below:

$$C_{worm} = C_{soil} \times BAF_i \quad (7)$$

where:

C_{worm} = Earthworm exposure point concentration (mg/kg)
C_{soil} = Soil exposure point concentration (mg/kg)
BAF_I = Bioaccumulation factor for invertebrates (kg_{soil}/kg_{tissue}).

The equation for plant ingestion is presented below:

$$Dose_{veg} = IR_{veg} \times C_{veg} \times AUF \times TUF \times GAF \quad (8)$$

where:

$Dose_{veg}$ = Amount of chemical ingested per day via the ingestion of vegetation (mg/kg-day)

IR_{veg} = Ingestion rate of plant matter (kg/kg-day)

C_{veg} = Chemical concentration in plant matter (mg/kg).

The equation used to estimate the chemical concentration in vegetation is presented below:

$$C_{veg} = C_{soil} \times SP_{v\ or\ r} \tag{9}$$

where:

C_{veg} = Vegetation exposure point concentration (mg/kg)

C_{soil} = Soil exposure point concentration (mg/kg)

$SP_{v\ or\ r}$ = Soil-to-plant transfer factor in vegetative or reproductive part of the plant (kg_{soil}/kg_{tissue}).

Equations 3 and 4 were used to estimate intakes from the ingestion of surface water and surface soil. Equation 5 also was used to estimate the total dose for the white-footed mouse by eliminating the soil and surface water portions of the equation. Soil ingestion by the white-footed mouse is assumed to be negligible. The nonseed plant portions of diet appear to provide the majority of the white-footed mouse's water (MacMillan and Garland 1989).

I.3.2 Avian Vermivore

The diet of the American woodcock consists primarily of animal prey. The animal prey of the receptor species is invertebrates, and for this assessment was assumed to be earthworms. Earthworms were selected as the representative food item because the earthworm has the greatest potential exposure to chemicals in surface soil, and therefore, the greatest potential for high ecoCOPC concentrations. Exposure parameter values for this receptor are presented in Table I-8. Equation 5 was used to calculate the dose of the ecoCOPCs that the American woodcock could be exposed to from ingestion of earthworms, soil, and surface water. The vegetation portion of the equation is deleted for this receptor. Equations 3, 4, and 7 were used to estimate intakes from the ingestion of surface water, surface soil, and earthworms.

I.3.3 Terrestrial and Aquatic Herbivores

The diet for the eastern cottontail rabbit and muskrat is composed primarily of plants. Both receptors ingest the vegetative portion (stems) of plants. Exposure parameter values for these receptors are presented in Tables I-9 and I-10. No data were available from the direct measurement of ecoCOPC concentrations in plant tissue; therefore, soil-to-plant bioconcentration factors (SP) were used to estimate these concentrations (Table I-6). The SP_v value was used to calculate the concentration in vegetative parts for the muskrat and the eastern cottontail rabbit. Equations 3 and 4 were used to estimate intakes from the ingestion of surface water and surface soil/sediment. Equation 5 was used to estimate the total dose for the eastern cottontail rabbit and muskrat by eliminating the animal portion of the equation.

I.3.4 Terrestrial Top Predators

The diet for the red fox and red-tailed hawk is composed primarily of small mammals. The diet of the red fox also includes soil, plants, and water. The animal diet for the red-tailed hawk and red fox is assumed to be 100 percent shrews. The fraction of soil and surface water ingested for the red-tailed hawk is assumed to be negligible and not a major pathway of exposure. Exposure parameter values for the red fox and red-tailed hawk are presented in Tables I-11 and I-12.

As no data were available from direct measurement of the concentration of ecoCOPCs in shrew tissue, animal to animal bioaccumulation factors (BAF_v) for vertebrates were used to estimate these concentrations (Table I-7). The following equations were used to calculate the dose of the ecoCOPCs that the hawk or red fox could be exposed to from ingestion of small mammals. The general equation for the red-tailed hawk is:

$$Dose_{total} = Dose_{animal} \tag{10}$$

The animal dose is defined further as:

$$Dose_{animal} = Dose_{total\ shrew} / (IR_{total\ shrew}) \times IR_{predator} \times BAF_v \times AUF \times TUF \times GAF \tag{11}$$

where:

$IR_{total\ shrew}$ = Ingestion rate of prey (shrew; kg/kg-day)
$IR_{predator}$ = Ingestion rate of predator (hawk or red fox ; kg/kg-day)
BAF_v = Bioaccumulation factor for vertebrates (kg_{food}/kg_{tissue}).

The general equation for the red fox is:

$$Dose_{total} = Dose_{animal} + Dose_{veg} + Dose_{soil} + Dose_{water} \tag{12}$$

Equations 3, 4, 8, and 11 further define the calculation of chemical concentrations in soil, water, vegetation, and animals.

I.4 TOXICITY REFERENCE VALUES

Toxicity reference values (TRVs) for wildlife receptors represent doses of the ecoCOPCs that are protective of the wildlife receptors. As indicated in Section I.3, terrestrial wildlife risks from the ingestion of prey and inadvertent ingestion of abiotic media (e.g., soil, sediment, and surface water) were evaluated. Chemicals identified as having the potential to adversely affect terrestrial species were evaluated by employing dose-based toxicological benchmarks. EPA has not developed toxicity criteria for terrestrial species. In addition, site-specific toxicological studies have not been conducted at Fort McClellan to determine the toxic potential of ecoCOPCs. Consequently, toxicity data in the scientific literature were reviewed to characterize the toxicity of the ecoCOPCs. Information on test concentrations, modes of exposure, and effects on similar species was used to establish TRVs for risk calculations.

Dose-based toxicological benchmarks (Sample, Opresko, and Suter 1996) were the preferred data source to evaluate the potential or adverse effects to the wildlife receptors of concern. The values presented in Sample et al. are chronic lowest-observable-adverse-effects levels (LOAELs) and chronic no-observable-adverse-effects levels NOAELs derived from bioassay studies of laboratory birds and mammals. The Oak Ridge National Laboratory (ORNL) benchmarks are derived from laboratory measurements of survival, growth, or reproduction. NOAELs are the highest dose of a chemical in a

study that causes no observable adverse effect on a test species, while LOAELs are the lowest dose of a chemical in a study that causes an observable adverse effect on a test species. NOAEL-based dietary limits are the preferred toxicity threshold for the screening-level ecological risk assessment (SERA). In some instances, a LOAEL was used to derive a NOAEL if a NOAEL was not available.

A dose (d) was selected from Sample, Opresko, and Suter (1996) or available scientific literature for each ecoCOPC. The following criteria were used to select the dose values:

- Doses based on the receptor species selected for evaluation were used preferentially; however, if toxicity information was not available for these species, animal doses within the same class as the receptor species were used.
- Data for reproductive or developmental effects were used preferentially; otherwise, the lowest dose (i.e., most conservative) for which a LOAEL or NOAEL is available was used.
- Chronic data were used in preference to subchronic or acute data, and NOAELs were used in preference to LOAELs and LD_{50}s.

TRVs for chronic NOAELs then were derived according to the following equation:

$$TRV = \frac{d}{UF} \tag{13}$$

where:

TRV = Toxicity reference value (mg/kg bw-d)
d = Literature-based daily dose (mg/kg bw-d)
UF = Total uncertainty factor (unitless).

The uncertainty factors used in this equation are similar to those used by Sample, Opresko, and Suter (1996) and are generally consistent with Army guidance on uncertainty factors (Wentsel et al. 1996). Sample, Opresko, and Suter (1996) recommend an uncertainty factor of 10 for extrapolation from a LOAEL to a NOAEL whereas Wentsel et al. (1996) suggest 5 is more appropriate. As most of the TRVs used in this SERA were derived by Sample, Opresko, and Suter (1996) using a factor of 10 (if needed), the SERA is using the more conservative value of 10. The magnitude of the uncertainty factor is dependent upon both the duration (i.e., chronic, subchronic, acute) and the endpoint measured (i.e., NOAEL, LOAEL, LD_{50}). If the endpoint of the bioassay was not a chronic NOAEL, the following factors were used to extrapolate the available data to a chronic NOAEL:

	Divide by
A chronic LOAEL to a chronic NOAEL	10
A subchronic NOAEL to a chronic NOAEL	10
A subchronic LOAEL to a chronic NOAEL	20
An acute NOAEL to a chronic NOAEL	30
An acute LOAEL to a chronic NOAEL	50
An acute LD_{50} to a chronic NOAEL	100

Test species TRVs for avian and mammalian wildlife are presented in Tables I-13 and I-14, respectively. In some instances, the available literature-based toxicological data were based on animals other than the selected receptor species. Study results have indicated that resistance to toxic chemicals usually varies among different species as a function of body size. This occurs because various

physiological functions (e.g., metabolic rates) are related to body size such that smaller mammalian species, for instance, have higher metabolic rates and are more resistant to toxic chemicals, given their ability to more rapidly detoxify contaminants. However, SERAs are meant to be conservative so the mammalian and avian TRVs were not extrapolated to account for size differences between the test species and the selected receptor species.

I.5 RISK CHARACTERIZATION

Risk characterization compares exposures to effects to determine the risk or likelihood of harm to the plants and animals. Hazard quotients (HQs) form the quantitative basis of this risk characterization (EPA 1989c).

HQs compare the estimated exposure concentrations or doses to toxicity threshold concentrations or doses. This relationship is shown as:

$$\text{Hazard Quotient (HQ)} = \frac{\text{Environmental Dose}}{\text{Toxicity Threshold Dose}} \tag{13}$$

where:

Hazard Quotient (HQ)	=	Unitless
Environmental Dose	=	mg/kg-day
Toxicity Threshold Dose	=	mg/kg-day.

An HQ greater than or equal to unity (1) indicates that a potential exists for harmful ecological effects and the ecoCOPC qualifies for further investigation. An HQ threshold of 1 assumes that the toxicity threshold and exposure concentrations are accurate. There is no clear consensus in regulatory guidance or scientific literature concerning the significance of the level of departure from an HQ of 1. EPA Region III (1994d), for example, considers HQs greater than 10 to be indicative of moderately high potential risk and HQs greater than 100 to be indicative of extreme risk. However, Wentsel et al. (1994) indicate no statistical analyses exist to support this interpretation.

One further complicating issue is that an HQ greater than 1 neither indicates the effect magnitude nor provides a measure of potential population-level effects (Menzie et al. 1992). For example, a high sediment HQ may be the result of an isolated "hot spot" rather than widespread contamination and may not indicate potential population/community-level effects because, no matter how high the HQ is above 1, the risk is likely limited to only receptors in the vicinity of the hot spot. Future estimated risks to plants and animals are considered similar to current risks.

I.6 HAZARD QUOTIENTS

Tables I-15 through I-21 (Area T-38), I-23 (Range L), I-25 (Landfill #1), and I-27 through I-34 (Landfill #3) present the HQs and hazard indices (HIs) for each site evaluated for food chain risks. In addition, Tables I-22, I-24, I-26, and I-35 present risk summaries by pathway and the total HI for each receptor. EcoCOPCs at Site 4 for which HQs were at or above 1 were aluminum, chromium, and lead (Table 7-39). HQs for aluminum ranged from 20 (white-footed mouse) to 2,194 (shrew). Chromium HQs ranged from 1.49 (red-tailed hawk) to 37 (woodcock). Lead HQs ranged from 4.15 (shrew) to 44 (woodcock). Aluminum was the only ecoCOPC with HQs greater than 1 at Sites 8 (312 for muskrat) and 9 (88 for muskrat) (Table 7-39). EcoCOPCs at Site 11 for which HQs were at or above 1 were aluminum, chromium, manganese, zinc, and DDD. The HQs for aluminum ranged from 1.15 (red-tailed hawk) to

4,421 (shrew). Chromium HQs ranged from 9.78 (robin) to 17 (woodcock). Manganese HQs ranged from 1.03 (cottontail) to 3.6 (shrew). HQs for zinc ranged from 5.8 (robin) to 8.86 (woodcock). HQs for DDD ranged from 3.33 (robin) to 5.77 (woodcock).

Aluminum at Sites 4, 8, 9, and 11 was the only ecoCOPC with HQs greater than 50. The majority of HQs at all four sites were between 1 and 50. The highest HQs at Sites 4, 3, 9, and 11 were for aluminum, chromium, and lead. Surface soil and sediment both had at least one HQ above 1. The only ecoCOPC with an HQ greater than 1 in sediment was aluminum. Surface water HQs were all below 1.

All receptors evaluated at Sites 4, 8, 9, and 11 had at least one HQ greater than 1. Aluminum was the only ecoCOPC with an HQ greater than 1 for the cottontail, white-footed mouse, and red fox at Site 4; the muskrat at Sites 8 and 9; and the white-footed mouse, red fox, and muskrat at Site 11.

These risks were based on a number of conservative assumptions in accordance with SERA guidance. Based on the conservative nature of the food chain model, bioaccumulation does not appear to be a major concern at these four sites. The number and magnitude of HQs greater than 1 would decrease if a more realistic (less conservative) model was conducted. More realistic exposure factors that would be used include an average exposure point concentration, AUF, and TUF. Aluminum often is listed as a food chain risk, despite not being commonly thought of as one of the major bioaccumulators (e.g., polychlorinated biphenyls [PCBs], mercury). As noted in Section 7, most of the risk associated with aluminum is not through consumption of plants or animals, but rather through incidental ingestion of surface soil and sediment. This pathway is totally dependent on the media concentrations (no bioaccumulation factors are involved). Aluminum is ubiquitous as a component of clay minerals and is not bioavailable at the same concentrations that are measured by destructive analyses of soil. Therefore, the bioavailability of aluminum may be overestimated.

Future estimated food chain risks to receptor species at the Fort McClellan sites are considered similar to current risks. The same species of animals are assumed to be present at these sites in the future. Habitats may change as a result of ecological succession and land use changes. This may affect the exact set of receptors at some locations that are currently in old fields and could succeed to forests. These changes are likely to be subtle in the context of this work, and no risk calculations were made solely for future conditions. Again, future and current food chain risks are assumed to be similar.

Table I-1. Soil/Sediment EcoCOPCs that do not Bioaccumulate
Fort McClellan RI, Anniston, Alabama

Chemical	Area T-38	Range L	Landfill #1	Landfill #3
Barium		X	X	X
Calcium		X	X	X
Iron	X	X	X	X
Magnesium		X	X	X
Potassium	X	X	X	X
Vanadium	X	X	X	X
Nickel		X	X	X
Benzyl alcohol		X	X	

Table I-2. Chemicals not Designated as EcoCOPCs that Bioaccumulate
Fort McClellan RI, Anniston, Alabama

Chemical	Area T-38	Range L	Landfill #1	Landfill #3
Surface Water				
Aluminum		X	X	X
Arsenic		X	X	
Barium		X		X
Iron		X	X	X
Lead			X	
Manganese				X
Selenium		X		
Zinc			X	X
alpha-BHC		X		X
delta-BHC		X		
Lindane				X
Sediment				
Chromium			X	X
Cobalt			X	X
Copper			X	
Lead			X	X
Manganese				X
Zinc			X	X
Benzo(g,h,i)perylene				X
Benzo(k)fluoranthene				X
Surface Soil				
Chromium			X	
Cobalt	X		X	
Copper	X			X
Lead			X	X
Manganese	X			
Zinc	X		X	
Benzo(a)anthracene				X
Chrysene				X

Table I-3. Exposure Parameters for Short-tailed Shrew
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: Short-Tailed Shrew (*Blarina brevicauda*)	
		Value	Reference/Notes
BW	Body weight (kg)	0.017	Arithmetic mean of means, both sexes, fall and summer, western Pennsylvania (EPA 1993b)
HR	Home range (ha)	0.36	Maximum, adult female, summer, Michigan (EPA 1993b)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.56	Arithmetic mean of adults, both sexes, 25°C, Wisconsin (EPA 1993b)
PF	Plant fraction of diet	0.13	June through October, New York (EPA 1993b); assuming vegetative parts and fungi
AF	Animal fraction of diet	0.87	June through October, New York (EPA 1993b); assuming 100% earthworms
SF	Soil fraction of diet	0.13	Talmage and Walton (1993)
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0.223	Adult, both sexes, Illinois, lab (EPA 1993b)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-4. Exposure Parameters for White-footed Mouse
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: White-footed Mouse (*Peromyscus leucopus*)	
		Value	Reference/Notes
BW	Body weight (kg)	0.025	
HR	Home range (ac)	0.15	Adult, both sexes, spring, mean, Tennessee (EPA 1993b)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.036	Mean, both sexes, adults and juveniles, free living, California (EPA 1993b)
PF	Plant fraction of diet	0.63	Wolfe et al. 1985
AF	Animal fraction of diet	0.37	Wolfe et al. 1985
SF	Soil fraction of diet	0	Assumed to be negligible
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0	The nonseed plant portions of diet apear to provide the majority of their water requirements (MacMillan and Garland 1989)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-5. Exposure Parameters for American Robin
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: American Robin (*Turdus migratorius*)	
		Value	Reference/Notes
BW	Body weight (kg)	0.08	Adult breeding female, New York (EPA 1993b)
HR	Home range (ha)	0.42	Adult, both sexes, spring, mean, Tennessee (EPA 1993b)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.89	Mean, both sexes, adults and juveniles, free living, California (EPA 1993b)
PF	Plant fraction of diet	0.5	Arithmetic mean, 4 seasons, central U.S., % of stomach contents that is plant material (EPA 1993b); assumed to be plant reproductive tissue
AF	Animal fraction of diet	0.5	Arithmetic mean, 4 seasons, central U.S., % of stomach contents that is animal material (EPA 1993b); assumed to be earthworm
SF	Soil fraction of diet	0.052	Value for American Woodcock (*Scolopax minor*), estimated percent soil in diet assuming 50 percent earthworms, dry weight (Beyer et al. 1994)
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0.14	Adult, both sexes, estimated (EPA 1993b)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-6. Soil-to-Plant Transfer Factors for Ecological Chemicals of Potential Concern
Fort McClellan RI, Anniston, Alabama

Ecological Chemical of Potential Concern	Soil-to-Plant (SP_v)				Soil-to-Plant (SP_r)			
	C_t/C_s (kg_{soil}/kg_{tissue})	Reference	CF	SP_v ($C_t/C_s \times CF$)	C_t/C_s (kg_{soil}/kg_{tissue})	Reference	CF	SPr ($C_t/C_s \times CF$)
Inorganics								
Aluminum	4.00E-03	Baes et al. (1984)	0.2	8.00E-04	6.50E-04	Baes et al. (1984)	0.2	1.30E-04
Chromium	7.50E-03	Baes et al. (1984)	0.2	1.50E-03	4.50E-03	Baes et al. (1984)	0.2	9.00E-04
Cobalt	2.00E-02	Baes et al. (1984)	0.2	4.00E-03	7.00E-03	Baes et al. (1984)	0.2	1.40E-03
Copper	4.00E-01	Baes et al. (1984)	0.2	8.00E-02	2.50E-01	Baes et al. (1984)	0.2	5.00E-02
Lead	4.50E-02	Baes et al. (1984)	0.2	9.00E-03	9.00E-03	Baes et al. (1984)	0.2	1.80E-03
Manganese	2.50E-01	Baes et al. (1984)	0.2	5.00E-02	5.00E-02	Baes et al. (1984)	0.2	1.00E-02
Mercury	9.00E-01	Baes et al. (1984)	0.2	1.80E-01	2.00E-01	Baes et al. (1984)	0.2	4.00E-02
Selenium	2.50E-02	Baes et al. (1984)	0.2	5.00E-03	2.50E-02	Baes et al. (1984)	0.2	5.00E-03
Zinc	1.50E+00	Baes et al. (1984)	0.2	3.00E-01	9.00E-01	Baes et al. (1984)	0.2	1.80E-01
Organics								
Benzo(a)anthracene	3.90E-03	HAZWRAP (1994)	1	3.90E-03	3.90E-03	HAZWRAP (1994)	1	3.90E-03
Benzo(b)fluoranthene	2.30E-03	HAZWRAP (1994)	1	2.30E-03	2.30E-03	HAZWRAP (1994)	1	2.30E-03
Chlordane	5.10E-03	HAZWRAP (1994)	1	5.10E-03	5.10E-03	HAZWRAP (1994)	1	5.10E-03
Chrysene	3.90E-03	HAZWRAP (1994)	1	3.90E-03	3.90E-03	HAZWRAP (1994)	1	3.90E-03
4,4'-DDD	1.30E-03	HAZWRAP (1994)	1	1.30E-03	1.30E-03	HAZWRAP (1994)	1	1.30E-03
4,4'-DDE	2.00E-03	HAZWRAP (1994)	1	2.00E-03	2.00E-03	HAZWRAP (1994)	1	2.00E-03
Dieldrin	2.00E-02	HAZWRAP (1994)	1	2.00E-02	2.00E-02	HAZWRAP (1994)	1	2.00E-02
Fluoranthene	2.00E-02	HAZWRAP (1994)	1	2.00E-02	2.00E-02	HAZWRAP (1994)	1	2.00E-02
Pyrene	6.70E-03	HAZWRAP (1994)	1	6.70E-03	6.70E-03	HAZWRAP (1994)	1	6.70E-03

NA = Not Available
SP = Soil-to-plant transfer (kg_{soil}/kg_{tissue}); v = vegetative parts, r = reproductive parts
C_t = Constituent concentration in tissue (mg/kg_{tissue})
C_s = Constituent concentration in soil (mg/kg_{soil})
CF = Conversion factor, dry weight to wet weight; 0.2 for dry weight values assuming tissue is 80 percent water (HAZWRAP 1994) and 1 for wet weight values

Table I-7. Terrestrial Bioaccumulation Factors for Ecological Chemicals of Potential Concern
Fort McClellan RI, Anniston, Alabama

Ecological Chemical of Potential Concern	Soil-to-Animal (BAF_i)				Animal-to-Animal (BAF_v)	
	C_t/C_s (kg_{soil}/kg_{tissue})	Reference	CF	BAF_i $C_t/C_s \times CF$	BAF_v (kg_{food}/kg_{tissue})	Reference
Inorganics						
Aluminum	7.50E-02	HAZWRAP (1994)	1	7.50E-02	7.50E-02	HAZWRAP (1994)
Chromium	1.10E+00	Sample et al. (1998)	0.2	2.20E-01	2.80E-01	HAZWRAP (1994)
Cobalt	1.00E+00	HAZWRAP (1994)	1	1.00E+00	1.00E+00	HAZWRAP (1994)
Copper	7.50E-01	Sample et al. (1998)	0.2	1.50E-01	5.00E-01	HAZWRAP (1994)
Lead	3.30E+00	Sample et al. (1998)	0.2	6.60E-01	1.50E-02	HAZWRAP (1994)
Manganese	6.40E-02	Sample et al. (1998)	0.2	1.00E-02	2.00E-02	HAZWRAP (1994)
Mercury	5.20E+00	Sample et al. (1998)	0.2	1.04E+00	1.30E+01	HAZWRAP (1994)
Selenium	1.80E+00	Sample et al. (1998)	0.2	3.60E-01	7.50E-01	HAZWRAP (1994)
Zinc	5.80E+00	Sample et al. (1998)	0.2	1.20E+00	5.00E+00	HAZWRAP (1994)
Organics						
Chlordane	1.60E+00	HAZWRAP (1994)	1	1.60E+00	2.90E+00	HAZWRAP (1994)
Benzo(a)anthracene	5.00E-02	HAZWRAP (1994)	1	5.00E-02	7.60E-01	HAZWRAP (1994)
Benzo(b)fluoranthene	5.00E-02	HAZWRAP (1994)	1	5.00E-02	1.90E+00	HAZWRAP (1994)
Chrysene	5.00E-02	HAZWRAP (1994)	1	5.00E-02	7.60E-01	HAZWRAP (1994)
4,4'-DDD	3.30E+00	HAZWRAP (1994)	1	3.30E+00	2.90E+00	HAZWRAP (1994)
4,4'-DDE	1.70E+00	HAZWRAP (1994)	1	1.70E+00	2.90E+00	HAZWRAP (1994)
Dieldrin	5.50E+00	HAZWRAP (1994)	1	5.50E+00	2.90E+00	HAZWRAP (1994)
Fluoranthene	5.00E-02	HAZWRAP (1994)	1	5.00E-02	1.30E-01	HAZWRAP (1994)
Pyrene	5.00E-02	HAZWRAP (1994)	1	5.00E-02	3.00E-01	HAZWRAP (1994)

NA = Not Available
BAF = Bioaccumulation factor; i = invertebrate (kg_{soil}/kg_{tissue}), v = vertebrate (kg_{tissue}/kg_{tissue})
C_t = Chemical concentration in tissue (mg/kg_{tissue})
C_s = Chemical concentration in soil (mg/kg_{soil})
CF = Conversion factor, dry weight to wet weight; 0.2 for dry weight values assuming tissue is 80% water (HAZWRAP 1994) and 1 for wet weight values.

Table I-8. Exposure Parameters for American Woodcock
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: American Woodcock (*Scolopax minor*)	
		Value	Reference/Notes
BW	Body weight (kg)	0.197	Arithmetic mean, both sexes, adults (EPA 1993b)
HR	Home range (ha)	32.4	Adult, both, summer, Wisconsin (EPA 1993b)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.77	Adult, both sexes, winter (EPA 1993b); assumed to be earthworm
PF	Plant fraction of diet	0	North Carolina and Alabama in winter, Maine in summer (EPA 1993b)
AF	Animal fraction of diet	1	Invertebrates (EPA 1993b)
SF	Soil fraction of diet	0.104	Estimated percent soil in diet, dry weight (EPA 1993b)
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0.1	Adult, male and female, estimated (EPA 1993b)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-9. Exposure Parameters for Eastern Cottontail
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: Eastern Cottontail (*Sylvilagus floridanus*)	
		Value	Reference/Notes
BW	Body weight (kg)	1.23	Arithmetic mean of four seasonal means, adult, both sexes, Georgia, all areas (EPA 1993b)
HR	Home range (ha)	3	Arithmetic mean of winter means, adult, both sexes, Wisconsin (EPA 1993b)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.205	Estimated by dividing free-living metabolic rate (203 kcal/kgBW/d) by the product of the energy composition of young grasses (1.3 kcal/g wet wt.) and assimilation efficiency (0.76) per Table 4-7 (EPA 1993b)
PF	Plant fraction of diet	1	EPA (1993); assumed to be vegetative parts
AF	Animal fraction of diet	0	Not reported in EPA (1993b); assumed to be negligible
SF	Soil fraction of diet	0.063	Value for Black-tailed Jackrabbit, estimated percent soil in diet, dry weight (EPA 1993b)
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0.097	Adult, both sexes (EPA 1993b)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-10. Exposure Parameters for Muskrat
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: Muskrat (*Ondatra zibethecus*)	
		Value	Reference/Notes
BW	Body weight (kg)	1.415	Average for male and female in New York (EPA 1993b)
HR	Home range (ac)	0.42	
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.34	Value for captive muskrat in Louisiana fed greens (EPA 1993b)
PF	Plant fraction of diet	1	Exclusively herbivorous (EPA 1993b): based on data from northeatsern US and Nova Scotia assumed to be vegetative parts
AF	Animal fraction of diet	0	Not reported in EPA (1993); assumed to be negligible
SF	Sediment fraction of diet	0.028	Assumed to be similar to the hispid cotton rat (Garten 1980)
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0.98	Estimated by EPA (1993)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-11. Exposure Parameters for Red Fox
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: Red Fox (*Vulpes vulpes*)	
		Value	Reference/Notes
BW	Body weight (kg)	4.69	Arithmetic average of means, both sexes, spring, Illinois, (EPA 1993b)
HR	Home range (ha)	596	Adult, female, spring, minimum, Minnesota (EPA 1993b)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.069	Adult, non-breeding, North Dakota (EPA 1993b)
PF	Plant fraction of diet	0.046	Illinois farm/woods, spring, percent wet weight (EPA 1993b); assumed to be reproductive parts
AF	Animal fraction of diet	0.954	Illinois farm/woods, spring, percent wet weight; including unspecified/other (EPA 1993b)
SF	Soil fraction of diet	0.028	Estimated percent soil in diet, dry weight (EPA 1993b)
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0.085	Arithmetic mean, adult, both sexes (EPA 1993b)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-12. Exposure Parameters for Red-tailed Hawk
Fort McClellan RI, Anniston, Alabama

Parameter	Definition	Receptor: Red-tailed Hawk (*Buteo jamaicensis*)	
		Value	Reference/Notes
BW	Body weight (kg)	1.13	Arithmetic mean, female and male, Michigan (EPA 1993b)
HR	Home range (ha)	697	Mean, adults, both sexes, winter, Michigan (EPA 1993b)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
AUF	Area use factor	1	Will be 1 to maximize exposure
IR_F	Food ingestion rate (g/g-d=kg/kgBW/d)[a]	0.11	Adult female, winter, Michigan, captive outdoors (EPA 1993b)
PF	Plant fraction of diet	0	Not stated in EPA (1993); assumed to be negligible
AF	Animal fraction of diet	1	Prey brought to nests (EPA 1993b)
SF	Soil fraction of diet	0	Not stated in EPA (1993b) and Beyer, et al. (1994); assumed to be negligible
IR_W	Water ingestion rate (g/g-d=L/kgBW/d)	0.057	Arithmetic mean, both sexes, estimated (EPA 1993b)

[a] Food ingestion rate (g/g-d) re-expressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF =1.0

Table I-13. Derivation of Avian Wildlife Reference Toxicity Doses
Fort McClellan RI, Anniston, Alabama

ecoCOPC	CAS Number	Test Organism	Effect	Endpoint	Daily Dose (mg/kg/d)	Reference[a]	Total Uncertainty	Chronic NOAEL Test Species (mg/kg/d)
Inoganics:								
Aluminum	7429-90-5	Ringed Dove	reproduction	chronic NOAEL	109.7	Carriere et al. (1986)	1	109.7
Cadmium	7440-43-9	Mallard Duck	reproduction	chronic NOAEL	1.45	White & Finley (1978)	1	1.45
Calcium	7440-70-2							
Chromium	7440-47-3	Black Duck	reproduction	chronic NOAEL	1	Haseltine et al. (unpublished)	1	1
Cobalt	7440-48-4							
Copper	7440-50-8	Chicken (chicks)	growth, mortality	chronic NOAEL	47	Mehring et al. (1960)	1	47
Iron	7439-89-6							
Lead	7439-92-1	Japanese Quail	reproduction	chronic NOAEL	1.13	Edens et al. (1976)	1	1.13
Magnesium	7439-95-4							
Manganese	7439-96-5	Japanese Quail	growth, aggressive behavior	chronic NOAEL	977	Laskey & Edens (1985)	1	977
Mercury	7439-97-6	Quail	reproduction	chronic LOAEL	0.45	Hill & Schaffner (1976)	1	0.45
Potassium	7440-09-7							
Selenium	7782-49-2	Mallard Duck	reproduction	chronic NOAEL	0.5	Heinz et al. (1987)	1	0.5
Vanadium	7440-62-2	Mallard Duck	mortality, body weight, blood	chronic NOAEL	11.4	White & Dieter (1978)	1	11.4
Zinc	7440-66-6	Chicken	Reproduction	chronic NOAEL	14.5	Stahl et al. (1990)	1	14.5
Organics:								
4,4'-DDD	72-54-8	Brown Pelican	Reproduction	chronic LOAEL	0.028	Anderson et al. (1975)	10	0.0028
4,4'-DDE	72-55-9	Mallard	Reproduction	chronic NOAEL	0.1	Opresko et al. (1994)	1	0.1
Benzo(a)anthracene	56-55-3	Bobwhite Quail	mortality	subchronic LOAEL	388	HSDB (1998)[b]	20	19.4
Benzo(b)fluoranthene	205-99-2	Bobwhite Quail	mortality	subchronic LOAEL	388	HSDB (1998)[b]	20	19.4
Chlordane	57-74-9	Red-winged Blackbird	mortality	chronic NOAEL	2.14	Stickel et al. (1983	1	2.14
Chrysene	218-01-9	Bobwhite Quail	mortality	subchronic LOAEL	388	HSDB (1998)[b]	20	19.4
Dieldrin	60-57-1	Barn Owl	reproduction	chronic NOAEL	0.077	Mendenhall et al. (1983)	1	0.077
di-n-Butylphthalate	84-74-2	Ringed Dove	reproduction	chronic LOAEL	1.1	Peakall (1974)	10	0.11
Fluoranthene	206-44-0	Bobwhite Quail	mortality	subchronic LOAEL	388	HDSB (1988)[b]	20	19.4
Pyrene	129-00-0	Bobwhite Quail	mortality	subchronic LOAEL	388	HSDB (1998)[b]	20	19.4

[a] As cited in Sample, Opresko, and Suter (1996) unless otherwise noted.

[b] See Section 9 for full citation.

Table I-14. Derivation of Mammalian Wildlife Reference Toxicity Doses
Fort McClellan RI, Anniston, Alabama

ecoCOPC	CAS Number	Test Organism	Effect	Endpoint	Daily Dose (mg/kg/d)	Reference[a]	Total Uncertainty	Chronic NOAEL Test Species (mg/kg/d)
Inorganics:								
Aluminum	7429-90-5	Mouse	reproduction	chronic LOAEL	19.3	Ondreicka et al. (1966)	10	1.93
Barium	7440-39-3	Rat	growth, hypertension	chronic NOAEL	5.06	Perry et al. (1983)	1	5.06
Cadmium	7440-43-9	Rat	reproduction	chronic NOAEL	1	Sutou et al. (1980)	1	1
Calcium	7440-70-2							
Chromium	7440-47-3	Rat	reproduction, longevity	chronic NOAEL	2737	Ivankovic & Preussman (1975)	1	2737
Cobalt	7440-48-4	Rat	mortality	acute LD50	6171	RTECS (1998)[b]	100	61.71
Copper	7440-50-8	Mink	reproduction	chronic NOAEL	11.7	Aulerich et al. (1982)	1	11.7
Iron	7439-89-6							
Lead	7439-92-1	Rat	reproduction	chronic NOAEL	8	Azar et al. (1973)	1	8
Magnesium	7439-95-4							
Manganese	7439-96-5	Rat	reproduction	chronic NOAEL	88	Laskey et al. (1982)	1	88
Mercury	7439-97-6	Mink	reproduction	chronic NOAEL	1.01	Aulerich et al. (1974)	1	1.01
Potassium	7440-09-7							
Selenium	7782-49-2	Rat	reproduction	chronic NOAEL	0.20	Rosenfeld & Beath (1954)	1	0.2
Vanadium	7440-62-2	Rat	reproduction	chronic LOAEL	2.1	Domingo et al. (1986)	10	0.21
Zinc	7440-66-6	Rat	reproduction	chronic NOAEL	160	Schlicker & Cox (1968)	1	160
Organics:								
4,4'-DDD	72-54-8	Mouse	systemic	chronic NOAEL	26	Pasha (1981)	1	26
4,4'-DDE	72-55-9	Hamster	systemic	chronic NOAEL	20	Cabral et al. (1982)	1	20
Benzo(a)anthracene	56-55-3	Rat	carcinogenicity	chronic LOAEL	40	Eisler (1987)	10	4
Benzo(b)fluoranthene	205-99-2	Rat	carcinogenicity	chronic LOAEL	40	Eisler (1987)	10	4
Chlordane	57-74-9	Mouse	reproduction	chronic NOAEL	4.58	Keplinger et al. (1968)	1	4.58
Chrysene	218-01-9	Rat	carcinogenicity	chronic LOAEL	99	Eisler (1987)	10	9.9
Dieldrin	60-57-1	Rat	reproduction	chronic LOAEL	0.2	Treon & Cleveland (1955)	10	0.02
di-N-Butyl Phthalate	84-74-2	Mouse	reproduction	chronic NOAEL	550	Lamb et al. (1987)	1	550
Fluoranthene	206-44-0	Mouse	nephropathy, increased liver weights, blood alterations, other clinical effects	subchronic NOAEL	125	USEPA (1988)	10	12.5
Pyrene	129-00-0	Mouse	kidney effects	chronic NOAEL	75	USEPA (1989e)	1	75

[a]As cited in Sample, Opresko, and Suter (1996) unless otherwise noted.

[b]See Section 9 for full citation.

TABLE I-15.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SHORT-TAILED SHREW AT AREA T-38
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	2.82E+03	1.46E+03	2.25E+00	1.17E+00	1.41E+03	7.33E+02	--	--	4.23E+03	2.19E+03
Chromium	2.74E+03	1.09E+01	3.99E-03	1.64E-02	5.98E-06	1.61E+01	5.87E-03	--	--	2.70E+01	9.87E-03
Iron	NBC	NBC	NBC	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Lead	8.00E+00	6.12E+00	7.64E-01	5.50E-02	6.88E-03	2.70E+01	3.38E+00	--	--	3.32E+01	4.15E+00
Potassium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Total Hazard Index			1.46E+03		1.17E+00		7.36E+02		0.00E+00		2.20E+03

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
-- Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-16.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR WHITE-FOOTED MOUSE AT AREA T-38 FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	--	--	7.02E-01	3.64E-01	3.87E+01	2.00E+01	--	--	3.94E+01	2.04E+01
Chromium	2.74E+03	--	--	5.10E-03	1.86E-06	4.40E-01	1.61E-04	--	--	4.45E-01	1.62E-04
Iron	NBC	--	--	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Lead	8.00E+00	--	--	1.71E-02	2.14E-03	7.38E-01	9.23E-02	--	--	7.56E-01	9.45E-02
Potassium	NBC	--	--	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Vanadium	NBC	--	--	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Total Hazard Index			0.00E+00		3.66E-01		2.01E+01		0.00E+00		2.05E+01

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
-- Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-17.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR EASTERN COTTONTAIL AT AREA T-38
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	5.00E+02	2.59E+02	6.35E+00	3.29E+00	--	--	--	--	5.06E+02	2.62E+02
Chromium	2.74E+03	1.94E+00	7.08E-04	4.61E-02	1.69E-05	--	--	--	--	1.98E+00	7.25E-04
Iron	NBC	NBC	NBC	NBC	NBC	--	--	--	--	NBC	NBC
Lead	8.00E+00	1.08E+00	1.36E-01	1.55E-01	1.94E-02	--	--	--	--	1.24E+00	1.55E-01
Potassium	NBC	NBC	NBC	NBC	NBC	--	--	--	--	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	--	--	--	--	NBC	NBC
Total Hazard Index			2.59E+02		3.31E+00		0.00E+00		0.00E+00		2.62E+02

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
-- Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-18.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR
RED FOX AT AREA T-38
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	7.48E+01	3.87E+01	1.60E-02	8.27E-03	3.73E+01	1.93E+01	--	--	1.12E+02	5.81E+01
Chromium	2.74E+03	2.90E-01	1.06E-04	4.28E-04	1.57E-07	8.89E-01	3.25E-04	--	--	1.18E+00	4.31E-04
Iron	NBC	NBC	NBC	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Lead	8.00E+00	1.62E-01	2.03E-02	4.80E-04	6.00E-05	5.85E-02	7.31E-03	--	--	2.21E-01	2.77E-02
Potassium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	--	--	NBC	NBC
Total Hazard Index			3.88E+01		8.33E-03		1.93E+01		0.00E+00		5.81E+01

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
-- Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-19.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR AMERICAN ROBIN AT AREA T-38
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.10E+02	1.78E+03	1.62E+01	2.24E+00	2.04E-02	1.29E+03	1.18E+01	- -	- -	3.07E+03	2.80E+01
Chromium	1.00E+00	6.90E+00	6.90E+00	6.01E-02	6.01E-02	1.47E+01	1.47E+01	- -	- -	2.16E+01	2.16E+01
Iron	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Lead	1.13E+00	3.86E+00	3.42E+00	6.73E-02	5.95E-02	2.47E+01	2.18E+01	- -	- -	2.86E+01	2.53E+01
Potassium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Total Hazard Index			2.65E+01		1.40E-01		4.83E+01		0.00E+00		7.50E+01

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-20.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR AMERICAN WOODCOCK AT AREA T-38
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.10E+02	3.10E+03	2.83E+01	--	--	2.23E+03	2.04E+01	--	--	5.33E+03	4.86E+01
Chromium	1.00E+00	1.20E+01	1.20E+01	--	--	2.54E+01	2.54E+01	--	--	3.74E+01	3.74E+01
Iron	NBC	NBC	NBC	--	--	NBC	NBC	--	--	NBC	NBC
Lead	1.13E+00	6.73E+00	5.95E+00	--	--	4.27E+01	3.78E+01	--	--	4.94E+01	4.37E+01
Potassium	NBC	NBC	NBC	--	--	NBC	NBC	--	--	NBC	NBC
Vanadium	NBC	NBC	NBC	--	--	NBC	NBC	--	--	NBC	NBC
Total Hazard Index			4.62E+01		0.00E+00		8.36E+01		0.00E+00		1.30E+02

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
-- Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-21.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR
RED-TAILED HAWK AT AREA T-38
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.10E+02	--	--	--	--	6.24E+01	5.69E-01	--	--	6.24E+01	5.69E-01
Chromium	1.00E+00	--	--	--	--	1.49E+00	1.49E+00	--	--	1.49E+00	1.49E+00
Iron	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Lead	1.13E+00	--	--	--	--	9.78E-02	8.65E-02	--	--	9.78E-02	8.65E-02
Potassium	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Vanadium	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Total Hazard Index			0.00E+00		0.00E+00		2.14E+00		0.00E+00		2.14E+00

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
-- Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

Table I-22. Summary of Ecological Screening Hazard Indices
Area T-38, Fort McClellan RI, Anniston, Alabama

Receptor	Surface Soil or Sediment HI		Plant HI		Animal HI		Surface Water HI	Total HI	
Short-Tailed Shrew	1.46E+03	E	1.17E+00	B	7.36E+02	E	NA	2.20E+03	E
White-footed Mouse	NA		3.66E-01	B	2.01E+01	E	NA	2.05E+01	E
Eastern Cottontail	2.59E+02	E	3.31E+00	E	NA		NA	2.62E+02	E
Red Fox	3.88E+01	E	8.33E-03	B	1.93E+01	E	NA	5.81E+01	E
American Robin	2.65E+01	E	1.40E-01	B	4.83E+01	E	NA	7.50E+01	E
American Woodcock	4.62E+01	E	NA		8.36E+01	E	NA	1.30E+02	E
Red-Tailed Hawk	NA		NA		2.14E+00	E	NA	2.14E+00	E

NA - pathway not evaluated or all detected chemicals eliminated as ecoCOPCs
B - HI $\leq$ 1
E - HI > 1

TABLE I-23.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR MUSKRAT AT RANGE L
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Sediment Dose[b] (mg/kg-day)	Sediment HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	5.85E+02	3.03E+02	1.67E+01	8.67E+00	- -	- -	- -	- -	6.02E+02	3.12E+02
Barium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Calcium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Chromium	2.74E+03	7.64E-01	2.79E-04	4.09E-02	1.49E-05	- -	- -	- -	- -	8.04E-01	2.94E-04
Cobalt	6.17E+01	8.77E-01	1.42E-02	1.25E-01	2.03E-03	- -	- -	- -	- -	1.00E+00	1.62E-02
Copper	1.17E+01	4.85E-01	4.14E-02	1.38E+00	1.18E-01	- -	- -	- -	- -	1.87E+00	1.60E-01
Iron	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Lead	8.00E+00	6.09E-01	7.62E-02	1.96E-01	2.45E-02	- -	- -	- -	- -	8.05E-01	1.01E-01
Magnesium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Manganese	8.80E+01	1.28E+01	1.45E-01	2.28E+01	2.59E-01	- -	- -	9.56E-01	1.09E-02	3.65E+01	4.15E-01
Nickel	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Selenium	2.00E-01	1.44E-02	7.19E-02	2.57E-03	1.28E-02	- -	- -	- -	- -	1.69E-02	8.47E-02
Vanadium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Zinc	1.60E+02	2.35E+00	1.47E-02	2.52E+01	1.57E-01	- -	- -	- -	- -	2.75E+01	1.72E-01
Benzyl Alcohol	NBC	NBC	NBC	- -	- -	- -	- -	- -	- -	NBC	NBC
Dieldrin	2.00E-02	3.41E-05	1.70E-03	2.43E-05	1.22E-03	- -	- -	- -	- -	5.84E-05	2.92E-03
Total Hazard Index			3.04E+02		9.24E+00		0.00E+00		1.09E-02		3.13E+02

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

Table I-24. Summary of Ecological Screening Hazard Indices
Range L, Fort McClellan RI, Anniston, Alabama

Receptor	Surface Soil or Sediment HI	Plant HI	Animal HI	Surface Water HI	Total HI
Muskrat	3E+02 E	9E+00 E	NA	1E-02 B	3E+02 E
Short-Tailed Shrew	NA	NA	NA	NA	NA
White-footed Mouse	NA	NA	NA	NA	NA
Eastern Cottontail	NA	NA	NA	NA	NA
Red Fox	NA	NA	NA	NA	NA
American Robin	NA	NA	NA	NA	NA
American Woodcock	NA	NA	NA	NA	NA
Red-Tailed Hawk	NA	NA	NA	NA	NA

NA - pathway not evaluated or all detected chemicals eliminated as ecoCOPCs
B - HI $\leq$ 1
E - HI > 1

TABLE I-25.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR MUSKRAT AT LANDFILL #1
FORT MCCLELLAN, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Sediment Dose[b] (mg/kg-day)	Sediment HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	1.66E+02	8.58E+01	4.73E+00	2.45E+00	- -	- -	- -	- -	1.70E+02	8.83E+01
Barium	5.06[c]	NBC	NBC	NBC	NBC	- -	- -	1.02E-01	2.02E-02	1.02E-01	2.02E-02
Calcium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Iron	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Magnesium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Manganese	8.80E+01	1.52E+01	1.73E-01	2.72E+01	3.09E-01	- -	- -	- -	- -	4.24E+01	4.82E-01
Nickel	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Benzyl Alcohol	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Total Hazard Index			8.60E+01		2.76E+00		0.00E+00		2.02E-02		8.88E+01

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
[c]Barium is only bioaccumulative in surface water, therefore it was not evaluated for sediment.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

Table I-26. Summary of Ecological Screening Hazard Indices
Landfill #1, Fort McClellan, Alabama

Receptor	Surface Soil or Sediment HI	Plant HI	Animal HI	Surface Water HI	Total HI
Muskrat	9E+01 E	3E+00 E	NA	2E-02 B	9E+01 E
Short-Tailed Shrew	NA	NA	NA	NA	NA
White-footed Mouse	NA	NA	NA	NA	NA
Eastern Cottontail	NA	NA	NA	NA	NA
Red Fox	NA	NA	NA	NA	NA
American Robin	NA	NA	NA	NA	NA
American Woodcock	NA	NA	NA	NA	NA
Red-Tailed Hawk	NA	NA	NA	NA	NA

NA - pathway not evaluated or all detected chemicals eliminated as ecoCOPCs
B - HI $\leq$ 1
E - HI > 1

TABLE I-27.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR MUSKRAT AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Sediment Dose[b] (mg/kg-day)	Sediment HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	5.79E+02	3.00E+02	1.65E+01	8.57E+00	- -	- -	- -	- -	5.95E+02	3.08E+02
Barium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Calcium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Copper	1.17E+01	2.37E-01	2.03E-02	6.77E-01	5.79E-02	- -	- -	- -	- -	9.14E-01	7.81E-02
Iron	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Lead	8.00E+00	- -	- -	- -	- -	- -	- -	6.94E-02	8.67E-03	6.94E-02	8.67E-03
Magnesium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Nickel	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
4,4'-DDE	2.00E+01	3.61E-05	1.80E-06	2.58E-06	1.29E-07	- -	- -	- -	- -	3.87E-05	1.93E-06
Benzo(a)anthracene	4.00E+00	7.62E-03	1.90E-03	1.06E-03	2.65E-04	- -	- -	- -	- -	8.68E-03	2.17E-03
Benzo(b)fluoranthene	4.00E+00	8.76E-03	2.19E-03	7.19E-04	1.80E-04	- -	- -	- -	- -	9.48E-03	2.37E-03
Chrysene	9.90E+00	6.00E-03	6.06E-04	8.35E-04	8.44E-05	- -	- -	- -	- -	6.83E-03	6.90E-04
Fluoranthene	1.25E+01	8.47E-03	6.78E-04	6.05E-03	4.84E-04	- -	- -	- -	- -	1.45E-02	1.16E-03
Pyrene	7.50E+01	1.14E-02	1.52E-04	2.73E-03	3.64E-05	- -	- -	- -	- -	1.42E-02	1.89E-04
Total Hazard Index			3.00E+02		8.63E+00		0.00E+00		8.67E-03		3.09E+02

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-28.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SHORT-TAILED SHREW AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	5.68E+03	2.94E+03	4.54E+00	2.35E+00	2.85E+03	1.48E+03	- -	- -	8.53E+03	4.42E+03
Barium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Calcium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Chromium	2.74E+03	4.94E+00	1.80E-03	7.40E-03	2.71E-06	7.27E+00	2.66E-03	- -	- -	1.22E+01	4.46E-03
Cobalt	6.17E+01	1.55E+00	2.51E-02	6.20E-03	1.01E-04	1.04E+01	1.68E-01	- -	- -	1.19E+01	1.93E-01
Iron	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Lead	8.00E+00	- -	- -	- -	- -	- -	- -	1.58E-02	1.97E-03	1.58E-02	1.97E-03
Manganese	8.80E+01	2.84E+02	3.23E+00	1.42E+01	1.61E-01	1.90E+01	2.16E-01	- -	- -	3.17E+02	3.60E+00
Mercury	1.01E+00	8.08E-03	8.00E-03	1.45E-03	1.44E-03	5.62E-02	5.57E-02	- -	- -	6.58E-02	6.51E-02
Nickel	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Zinc	1.60E+02	9.32E+00	5.82E-02	2.80E+00	1.75E-02	7.48E+01	4.68E-01	- -	- -	8.69E+01	5.43E-01
4,4'-DDD	2.60E+01	4.48E-04	1.72E-05	5.83E-07	2.24E-08	9.90E-03	3.81E-04	- -	- -	1.04E-02	3.98E-04
4,4'-DDE	2.00E+01	1.01E-03	5.06E-05	2.02E-06	1.01E-07	1.15E-02	5.76E-04	- -	- -	1.25E-02	6.26E-04
Chlordane	4.58E+00	4.14E-02	9.03E-03	2.11E-04	4.60E-05	4.43E-01	9.67E-02	- -	- -	4.84E-01	1.06E-01
Fluoranthene	1.25E+01	1.38E-02	1.11E-03	2.77E-04	2.21E-05	4.63E-03	3.70E-04	- -	- -	1.87E-02	1.50E-03
Pyrene	7.50E+01	2.18E-02	2.91E-04	1.46E-04	1.95E-06	7.31E-03	9.74E-05	- -	- -	2.93E-02	3.91E-04
Total Hazard Index			2.95E+03		2.53E+00		1.48E+03		1.97E-03		4.43E+03

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-29.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR WHITE-FOOTED MOUSE AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	- -	- -	1.42E+00	7.33E-01	7.79E+01	4.04E+01	- -	- -	7.93E+01	4.11E+01
Barium	NBC	- -	- -	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Calcium	NBC	- -	- -	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Chromium	2.74E+03	- -	- -	2.31E-03	8.43E-07	1.99E-01	7.26E-05	- -	- -	2.01E-01	7.34E-05
Cobalt	6.17E+01	- -	- -	1.93E-03	3.13E-05	2.84E-01	4.60E-03	- -	- -	2.86E-01	4.63E-03
Iron	NBC	- -	- -	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Manganese	8.80E+01	- -	- -	4.42E+00	5.03E-02	5.19E-01	5.90E-03	- -	- -	4.94E+00	5.62E-02
Mercury	1.01E+00	- -	- -	4.53E-04	4.49E-04	1.54E-03	1.52E-03	- -	- -	1.99E-03	1.97E-03
Nickel	NBC	- -	- -	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Potassium	NBC	- -	- -	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Vanadium	NBC	- -	- -	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Zinc	1.60E+02	- -	- -	8.71E-01	5.44E-03	2.05E+00	1.28E-02	- -	- -	2.92E+00	1.82E-02
4,4'-DDD	2.60E+01	- -	- -	1.82E-07	6.99E-09	2.71E-04	1.04E-05	- -	- -	2.71E-04	1.04E-05
4,4'-DDE	2.00E+01	- -	- -	6.31E-07	3.15E-08	3.15E-04	1.57E-05	- -	- -	3.15E-04	1.58E-05
Chlordane	4.58E+00	- -	- -	6.57E-05	1.43E-05	1.21E-02	2.64E-03	- -	- -	1.22E-02	2.66E-03
Fluoranthene	1.25E+01	- -	- -	8.62E-05	6.89E-06	1.27E-04	1.01E-05	- -	- -	2.13E-04	1.70E-05
Pyrene	7.50E+01	- -	- -	4.56E-05	6.08E-07	2.00E-04	2.66E-06	- -	- -	2.45E-04	3.27E-06
Total Hazard Index			0.00E+00		7.89E-01		4.04E+01		0.00E+00		4.12E+01

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-30.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR EASTERN COTTONTAIL AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	1.01E+03	5.22E+02	1.28E+01	6.63E+00	- -	- -	- -	- -	1.02E+03	5.29E+02
Barium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Calcium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Chromium	2.74E+03	8.76E-01	3.20E-04	2.08E-02	7.62E-06	- -	- -	- -	- -	8.96E-01	3.28E-04
Cobalt	6.17E+01	2.75E-01	4.46E-03	1.75E-02	2.83E-04	- -	- -	- -	- -	2.93E-01	4.74E-03
Iron	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Lead	8.00E+00	- -	- -	- -	- -	- -	- -	6.87E-03	8.58E-04	6.87E-03	8.58E-04
Manganese	8.80E+01	5.04E+01	5.72E-01	4.00E+01	4.54E-01	- -	- -	- -	- -	9.03E+01	1.03E+00
Mercury	1.01E+00	1.43E-03	1.42E-03	4.10E-03	4.06E-03	- -	- -	- -	- -	5.53E-03	5.47E-03
Nickel	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	- -	- -	- -	- -	NBC	NBC
Zinc	1.60E+02	1.65E+00	1.03E-02	7.87E+00	4.92E-02	- -	- -	- -	- -	9.53E+00	5.95E-02
4,4'-DDD	2.60E+01	7.96E-05	3.06E-06	1.64E-06	6.31E-08	- -	- -	- -	- -	8.12E-05	3.12E-06
4,4'-DDE	2.00E+01	1.80E-04	8.98E-06	5.70E-06	2.85E-07	- -	- -	- -	- -	1.85E-04	9.26E-06
Chlordane	4.58E+00	7.34E-03	1.60E-03	5.94E-04	1.30E-04	- -	- -	- -	- -	7.93E-03	1.73E-03
Fluoranthene	1.25E+01	2.45E-03	1.96E-04	7.79E-04	6.23E-05	- -	- -	- -	- -	3.23E-03	2.59E-04
Pyrene	7.50E+01	3.87E-03	5.17E-05	4.12E-04	5.49E-06	- -	- -	- -	- -	4.29E-03	5.72E-05
Total Hazard Index			5.23E+02		7.14E+00		0.00E+00		8.58E-04		5.30E+02

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-31.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR
RED FOX AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.93E+00	1.51E+02	7.81E+01	3.22E-02	1.67E-02	7.52E+01	3.90E+01	- -	- -	2.26E+02	1.17E+02
Barium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Calcium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Chromium	2.74E+03	1.31E-01	4.79E-05	1.94E-04	7.08E-08	4.02E-01	1.47E-04	- -	- -	5.33E-01	1.95E-04
Cobalt	6.17E+01	4.12E-02	6.67E-04	9.46E-05	1.53E-06	1.40E+00	2.27E-02	- -	- -	1.44E+00	2.34E-02
Iron	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Lead	8.00E+00	- -	- -	- -	- -	2.78E-05	3.48E-06	6.02E-03	7.52E-04	6.05E-03	7.56E-04
Manganese	8.80E+01	7.53E+00	8.56E-02	1.24E-01	1.41E-03	7.46E-01	8.47E-03	- -	- -	8.40E+00	9.55E-02
Mercury	1.01E+00	2.14E-04	2.12E-04	1.41E-05	1.40E-05	1.01E-01	9.95E-02	- -	- -	1.01E-01	9.97E-02
Nickel	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Zinc	1.60E+02	2.47E-01	1.55E-03	7.31E-02	4.57E-04	5.11E+01	3.19E-01	- -	- -	5.14E+01	3.21E-01
4,4'-DDD	2.60E+01	1.19E-05	4.58E-07	2.54E-08	9.78E-10	3.53E-03	1.36E-04	- -	- -	3.54E-03	1.36E-04
4,4'-DDE	2.00E+01	2.69E-05	1.34E-06	8.82E-08	4.41E-09	4.27E-03	2.14E-04	- -	- -	4.30E-03	2.15E-04
Chlordane	4.58E+00	1.10E-03	2.40E-04	9.19E-06	2.01E-06	1.65E-01	3.60E-02	- -	- -	1.66E-01	3.63E-02
Fluoranthene	1.25E+01	3.67E-04	2.94E-05	1.21E-05	9.65E-07	2.86E-04	2.29E-05	- -	- -	6.65E-04	5.32E-05
Pyrene	7.50E+01	5.80E-04	7.73E-06	6.38E-06	8.51E-08	1.03E-03	1.38E-05	- -	- -	1.62E-03	2.16E-05
Total Hazard Index			7.82E+01		1.86E-02		3.95E+01		7.52E-04		1.18E+02

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-32.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR AMERICAN ROBIN AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.10E+02	3.59E+03	3.27E+01	4.51E+00	4.11E-02	2.60E+03	2.37E+01	- -	- -	6.20E+03	5.65E+01
Barium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Calcium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Chromium	1.00E+00	3.12E+00	3.12E+00	2.72E-02	2.72E-02	6.64E+00	6.64E+00	- -	- -	9.78E+00	9.78E+00
Cobalt	No TRV	9.80E-01	No TRV	1.33E-02	No TRV	9.48E+00	No TRV	- -	- -	1.05E+01	No TRV
Iron	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Lead	1.13E+00	- -	- -	- -	- -	- -	- -	9.91E-03	8.77E-03	9.91E-03	8.77E-03
Manganese	9.77E+02	1.79E+02	1.84E-01	1.74E+01	1.78E-02	1.74E+01	1.78E-02	- -	- -	2.14E+02	2.19E-01
Mercury	4.50E-01	5.11E-03	1.13E-02	1.98E-03	4.39E-03	5.14E-02	1.14E-01	- -	- -	5.85E-02	1.30E-01
Nickel	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Vanadium	NBC	NBC	NBC	NBC	NBC	NBC	NBC	- -	- -	NBC	NBC
Zinc	1.45E+01	5.89E+00	4.06E-01	1.03E+01	7.07E-01	6.84E+01	4.71E+00	- -	- -	8.45E+01	5.83E+00
4,4'-DDD	2.80E-03	2.83E-04	1.01E-01	3.56E-06	1.27E-03	9.05E-03	3.23E+00	- -	- -	9.33E-03	3.33E+00
4,4'-DDE	1.00E-01	6.39E-04	6.39E-03	1.24E-05	1.24E-04	1.05E-02	1.05E-01	- -	- -	1.12E-02	1.12E-01
Chlordane	2.14E+00	2.61E-02	1.22E-02	1.29E-03	6.02E-04	4.04E-01	1.89E-01	- -	- -	4.32E-01	2.02E-01
Fluoranthene	1.94E+01	8.74E-03	4.51E-04	1.69E-03	8.72E-05	4.23E-03	2.18E-04	- -	- -	1.47E-02	7.56E-04
Pyrene	1.94E+01	1.38E-02	7.11E-04	8.94E-04	4.61E-05	6.68E-03	3.44E-04	- -	- -	2.14E-02	1.10E-03
Total Hazard Index			3.65E+01		8.00E-01		3.87E+01		8.77E-03		7.61E+01

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE 1-33.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR AMERICAN WOODCOCK AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.10E+02	6.25E+03	5.69E+01	- -	- -	4.50E+03	4.11E+01	- -	- -	1.08E+04	9.80E+01
Barium	NBC	NBC	NBC	- -	- -	NBC	NBC	- -	- -	NBC	NBC
Calcium	NBC	NBC	NBC	- -	- -	NBC	NBC	- -	- -	NBC	NBC
Chromium	1.00E+00	5.43E+00	5.43E+00	- -	- -	1.15E+01	1.15E+01	- -	- -	1.69E+01	1.69E+01
Cobalt	No TRV	1.71E+00	No TRV	- -	- -	1.64E+01	No TRV	- -	- -	1.81E+01	No TRV
Iron	NBC	NBC	NBC	- -	- -	NBC	NBC	- -	- -	NBC	NBC
Lead	1.13E+00	- -	- -	- -	- -	- -	- -	7.08E-03	6.27E-03	7.08E-03	6.27E-03
Manganese	9.77E+02	3.12E+02	3.20E-01	- -	- -	3.00E+01	3.07E-02	- -	- -	3.42E+02	3.50E-01
Mercury	4.50E-01	8.89E-03	1.98E-02	- -	- -	8.89E-02	1.98E-01	- -	- -	9.78E-02	2.17E-01
Nickel	NBC	NBC	NBC	- -	- -	NBC	NBC	- -	- -	NBC	NBC
Potassium	NBC	NBC	NBC	- -	- -	NBC	NBC	- -	- -	NBC	NBC
Vanadium	NBC	NBC	NBC	- -	- -	NBC	NBC	- -	- -	NBC	NBC
Zinc	1.45E+01	1.03E+01	7.07E-01	- -	- -	1.18E+02	8.16E+00	- -	- -	1.29E+02	8.86E+00
4,4'-DDD	2.80E-03	4.93E-04	1.76E-01	- -	- -	1.57E-02	5.59E+00	- -	- -	1.61E-02	5.77E+00
4,4'-DDE	1.00E-01	1.11E-03	1.11E-02	- -	- -	1.82E-02	1.82E-01	- -	- -	1.93E-02	1.93E-01
Chlordane	2.14E+00	4.55E-02	2.13E-02	- -	- -	7.00E-01	3.27E-01	- -	- -	7.45E-01	3.48E-01
Fluoranthene	1.94E+01	1.52E-02	7.84E-04	- -	- -	7.32E-03	3.77E-04	- -	- -	2.25E-02	1.16E-03
Pyrene	1.94E+01	2.40E-02	1.24E-03	- -	- -	1.16E-02	5.95E-04	- -	- -	3.56E-02	1.83E-03
Total Hazard Index			6.36E+01		0.00E+00		6.70E+01		6.27E-03		1.31E+02

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
- - Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

TABLE I-34.
HAZARD QUOTIENT OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR RED-TAILED HAWK AT LANDFILL #3
FORT MCCLELLAN RI, ANNISTON, ALABAMA

Ecological Chemicals of Potential Concern	TRV[a] (mg/kg-day)	Surface Soil Dose[b] (mg/kg-day)	Surface Soil HQ	Plant Dose[b] (mg/kg-day)	Plant HQ	Animal Dose[b] (mg/kg-day)	Animal HQ	Surface Water Dose[b] (mg/kg-day)	Surface Water HQ	Total Dose (mg/kg-day)	Total HQ
Aluminum	1.10E+02	--	--	--	--	126	1.15	--	--	126	1.15
Barium	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Calcium	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Chromium	1.00E+00	--	--	--	--	0.672	0.672	--	--	0.672	0.672
Cobalt	No TRV	--	--	--	--	2.34	No TRV	--	--	2.34	No TRV
Iron	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Lead	1.13E+00	--	--	--	--	4.652E-05	4.117E-05	--	--	4.652E-05	4.117E-05
Manganese	9.77E+02	--	--	--	--	1.25	0.00128	--	--	1.25	0.00128
Mercury	4.50E-01	--	--	--	--	0.168	0.373	--	--	0.168	0.373
Nickel	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Potassium	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Vanadium	NBC	--	--	--	--	NBC	NBC	--	--	NBC	NBC
Zinc	1.45E+01	--	--	--	--	85	5.89	--	--	85	5.89
4,4'-DDD	2.80E-03	--	--	--	--	0.00590	2.11	--	--	0.00590	2.11
4,4'-DDE	1.00E-01	--	--	--	--	0.00714	0.0714	--	--	0.00714	0.0714
Chlordane	2.14E+00	--	--	--	--	0.276	0.129	--	--	0.276	0.129
Fluoranthene	1.94E+01	--	--	--	--	0.000478	2.466E-05	--	--	0.000478	2.466E-05
Pyrene	1.94E+01	--	--	--	--	0.00173	8.898E-05	--	--	0.00173	8.898E-05
Total Hazard Index			0		0		10		0		10

[a] See Appendix I for TRV discussion.
[b] See Appendix I for discussion of dose derivation.
HQ = Hazard Quotient
TRV = Toxicity Reference Value
NBC = Not A Bioaccumulative Chemical
-- Exposure pathway not relevant for receptor, or chemical not selected as an ecoCOPC in the exposure medium, or chemical not of bioaccumulative concern

Table I-35. Summary of Ecological Screening Hazard Indices
Landfill #3, Fort McClellan RI, Anniston, Alabama

Receptor	Surface Soil or Sediment HI		Plant HI		Animal HI		Surface Water HI		Total HI	
Muskrat	3E+02	E	9E+00	E	NA		9E-03	B	3E+02	E
Short-Tailed Shrew	3E+03	E	3E+00	E	1E+03	E	2E-03	B	4E+03	E
White-footed Mouse	NA		8E-01	B	4E+01	E	NA		4E+01	E
Eastern Cottontail	5E+02	E	7E+00	E	NA		9E-04	B	5E+02	E
Red Fox	8E+01	E	2E-02	B	4E+01	E	8E-04	B	1E+02	E
American Robin	4E+01	E	8E-01	B	4E+01	E	9E-03	B	8E+01	E
American Woodcock	6E+01	E	NA		7E+01	E	6E-03	B	1E+02	E
Red-Tailed Hawk	NA		NA		1E+01	E	NA		1E+01	E

NA - pathway not evaluated or all detected chemicals eliminated as ecoCOPCs
B - HI $\leq$ 1
E - HI > 1

Table I-36. Analysis of Variance Background Comparison for Surface Water at Range L
Ft. McClellan Army Depot, Ft. McClellan, Alabama

Exposure Unit: WS Parameter	Units	Frequency of Detection[a]	Site Maximum	Background Maximum	Probability of Accepting/ Rejecting Null Hypothesis[b]	Site Mean[a]	Background Mean[a]	Result of Background Comparison[c]
Aluminum	µg/L	100%	1,440	47,800	0.28	800	2,845	Not Site Related
Arsenic	µg/L	50%	3.2	11	0.0037	2.2	1.1	Site Related
Barium	µg/L	100%	32	200	0.90	20	39	Not Site Related
Calcium	µg/L	100%	6,140	64,100	0.88	2,443	13,317	Not Site Related
Iron	µg/L	100%	7,040	232,000	0.019	4,788	10,565	Not Site Related
Magnesium	µg/L	100%	1,050	24,400	0.97	578	5,538	Not Site Related
Manganese	µg/L	100%	975	6,060	0.058	525	302	Not Site Related
Potassium	µg/L	75%	1,870	7,120	0.22	1,383	1,302	Not Site Related
Selenium	µg/L	25%	3.4	- -	0.96	1.8	- -	Site Related
Sodium	µg/L	100%	1,760	15,200	0.97	843	1,777	Not Site Related
1,1,1-Trichloroethane	µg/L	25%	2.7	- -	- -	1.1	- -	Site Related
2,4,6-Trinitrotoluene	µg/L	50%	2.2	- -	- -	0.89	- -	Site Related
2,4-Dinitrotoluene	µg/L	50%	5.4	- -	- -	1.9	- -	Site Related
2,6-Dinitrotoluene	µg/L	50%	2.3	- -	- -	0.92	- -	Site Related
alpha-BHC	µg/L	50%	0.0033	- -	- -	0.0023	- -	Site Related
delta-BHC	µg/L	50%	0.0073	- -	- -	0.0043	- -	Site Related

[a] Results of duplicate analyses were averaged and nondetects were treated as one-half the detection limit in the calculation of the arithmetic mean.

[b] The Null Hypothesis assumes that site and background data are from the same population.

[c] For the Analysis of Variance: If the probability >0.05, the analyte is considered not site-related. If the probability <0.05 and the site mean > the background mean, the analyte is considered site-related.

- - Not applicable (analyte not detected; statistical test is not applicable in certain cases described above; background comparison not conducted for organic compounds)

Table I-37. Analysis of Variance Background Comparison for Sediment at Range L
Ft. McClellan Army Depot, Ft. McClellan, Alabama

Exposure Unit: DS Parameter	Units	Frequency of Detection[a]	Site Maximum	Background Maximum	Probability of Accepting/ Rejecting Null Hypothesis[b]	Site Mean[a]	Background Mean[a]	Result of Background Comparison[c]
Aluminum	mg/kg	80%	61,500	17,400	0.00016	30,720	4,430	Site Related
Barium	mg/kg	80%	165	270	0.0041	107	52	Site Related
Calcium	mg/kg	80%	1,800	2,810	0.032	958	570	Site Related
Chromium	mg/kg	80%	80	63	0.00038	57	16	Site Related
Cobalt	mg/kg	80%	92	59	0.0034	41	6.6	Site Related
Copper	mg/kg	80%	51	112	0.0013	31	12	Site Related
Iron	mg/kg	80%	49,200	57,500	0.0062	32,860	17,740	Site Related
Lead	mg/kg	80%	64	260	0.0086	39	24	Site Related
Magnesium	mg/kg	80%	3,290	3,270	0.0020	1,501	485	Site Related
Manganese	mg/kg	80%	1,340	10,000	0.016	734	535	Site Related
Nickel	mg/kg	80%	176	33	0.00057	76	6.8	Site Related
Potassium	mg/kg	80%	8,010	4,810	0.0013	3,066	538	Site Related
Selenium	mg/kg	40%	1.5	1.9	0.023	0.78	0.30	Site Related
Sodium	mg/kg	40%	222	738	1.00	76	341	Not Site Related
Vanadium	mg/kg	80%	111	67	0.00028	73	21	Site Related
Zinc	mg/kg	80%	247	111	0.00063	139	27	Site Related
Dieldrin	mg/kg	20%	0.0036	--	--	0.0017	--	Site Related

[a] Results of duplicate analyses were averaged and nondetects were treated as one-half the detection limit in the calculation of the arithmetic mean.

[b] The Null Hypothesis assumes that site and background data are from the same population.

[c] For the Analysis of Variance: If the probability >0.05, the analyte is considered not site-related. If the probability <0.05 and the site mean > the background mean, the analyte is considered site-related.

-- Not applicable (analyte not detected; statistical test is not applicable in certain cases described above; background comparison not conducted for organic compounds)

Table I-38. Analysis of Variance Background Comparison for Surface Water at Landfill #3
Ft. McClellan Army Depot, Ft. McClellan, Alabama

Exposure Unit: WS Parameter	Units	Frequency of Detection[a]	Site Maximum	Background Maximum	Probability of Accepting/ Rejecting Null Hypothesis[b]	Site Mean[a]	Background Mean[a]	Result of Background Comparison[c]
Aluminum	µg/L	80%	1,620	47,800	0.20	930	2,845	Not Site Related
Barium	µg/L	100%	43	200	0.14	33	39	Not Site Related
Calcium	µg/L	100%	19,300	64,100	0.29	12,870	13,317	Not Site Related
Iron	µg/L	100%	7,930	232,000	0.043	3,359	10,565	Not Site Related
Lead	µg/L	20%	71	47	0.029	20	4.8	Site Related
Magnesium	µg/L	100%	8,760	24,400	0.32	4,862	5,538	Not Site Related
Manganese	µg/L	100%	464	6,060	0.20	179	302	Not Site Related
Potassium	µg/L	80%	3,710	7,120	0.011	2,586	1,302	Site Related
Sodium	µg/L	100%	10,100	15,200	0.033	3,662	1,777	Site Related
Zinc	µg/L	40%	22	182	0.85	14	21	Not Site Related
1,1,1-Trichloroethane	µg/L	40%	6.2	- -	- -	1.8	- -	Site Related
Trichloroethene	µg/L	20%	1.3	- -	- -	0.66	- -	Site Related
alpha-BHC	µg/L	20%	0.0035	- -	- -	0.53	- -	Site Related
Lindane	µg/L	20%	0.0041	- -	- -	0.72	- -	Site Related

[a] Results of duplicate analyses were averaged and nondetects were treated as one-half the detection limit in the calculation of the arithmetic mean.

[b] The Null Hypothesis assumes that site and background data are from the same population.

[c] For the Analysis of Variance: If the probability >0.05, the analyte is considered not site-related. If the probability <0.05 and the site mean > the background mean, the analyte is considered site-related.

- - Not applicable (analyte not detected; statistical test is not applicable in certain cases described above; background comparison not conducted for organic compounds)

Table I-39. Analysis of Variance Background Comparison for Surface Soils at Landfill #3
Ft. McClellan Army Depot, Ft. McClellan, Alabama

Exposure Unit: SS Parameter	Units	Frequency of Detection[a]	Site Maximum	Background Maximum	Probability of Accepting/ Rejecting Null Hypothesis[b]	Site Mean[a]	Background Mean[a]	Result of Background Comparison[c]
Aluminum	mg/kg	83%	78,000	39,900	4.31E-05	46,900	8,224	Site Related
Barium	mg/kg	83%	198	293	0.0017	130	61	Site Related
Calcium	mg/kg	83%	6,610	17,900	0.0027	2,624	850	Site Related
Chromium	mg/kg	83%	68	134	0.00069	40	18	Site Related
Cobalt	mg/kg	83%	21	71	0.0096	12	7.1	Site Related
Copper	mg/kg	83%	30	24	5.53E-05	23	6.3	Site Related
Iron	mg/kg	83%	57,400	56,300	0.00051	39,850	17,185	Site Related
Lead	mg/kg	83%	46	83	0.013	32	20	Site Related
Magnesium	mg/kg	83%	4,300	9,600	8.99E-05	3,195	526	Site Related
Manganese	mg/kg	83%	3,900	6,850	0.20	1,491	728	Not Site Related
Mercury	mg/kg	17%	0.11	0.32	0.067	0.051	0.040	Not Site Related
Nickel	mg/kg	83%	44	22	0.00016	23	5.1	Site Related
Potassium	mg/kg	83%	5,550	6,010	7.06E-05	4,243	408	Site Related
Sodium	mg/kg	83%	127	563	1.00	89	315	Not Site Related
Vanadium	mg/kg	83%	94	158	0.0016	62	30	Site Related
Zinc	mg/kg	83%	128	209	0.00028	68	20	Site Related
4,4'-DDD	mg/kg	17%	0.0062	- -	- -	0.0022	- -	Site Related
4,4'-DDE	mg/kg	33%	0.014	0.0031	- -	0.0039	0.0053	Site Related
Benzo(a)anthracene	mg/kg	33%	0.16	0.010	- -	0.060	0.026	Site Related
Chlordane	mg/kg	17%	0.57	- -	- -	0.12	- -	Site Related
Chrysene	mg/kg	33%	0.091	0.0042	- -	0.040	0.046	Site Related
Fluoranthene	mg/kg	33%	0.19	0.098	- -	0.062	0.021	Site Related
Phenanthrene	mg/kg	17%	0.087	0.072	- -	0.028	0.022	Site Related
Pyrene	mg/kg	33%	0.30	0.096	- -	0.11	0.031	Site Related

[a] Results of duplicate analyses were averaged and nondetects were treated as one-half the detection limit in the calculation of the arithmetic mean.

[b] The Null Hypothesis assumes that site and background data are from the same population.

[c] For the Analysis of Variance: If the probability >0.05, the analyte is considered not site-related. If the probability <0.05 and the site mean > the background mean, the analyte is considered site-related.

- - Not applicable (analyte not detected; statistical test is not applicable in certain cases described above; background comparison not conducted for organic compounds)