

**Table 6-1. Risk of COPECs Elevated above Reference in Eggs, Eggshells, and Nestlings
Tennessee Valley Authority Kingston, Tennessee**

Constituent	Risk
Heron Eggs	
Selenium	Negligible - no thresholds exceeded
Mercury	Negligible - no thresholds exceeded
Copper	Negligible - unlikely thresholds exceeded*
Osprey Eggs	
None	None
Tree Swallow Eggs	
Selenium	Low - a few eggs exceed threshold
Strontium	Negligible - no thresholds exceeded
Copper	Negligible - unlikely thresholds exceeded*
Manganese	Negligible - unlikely thresholds exceeded*
Tree Swallow Eggshells	
Strontium	Negligible - unlikely thresholds exceeded
Tree Swallow Nestlings	
Selenium	Negligible - no thresholds exceeded
Strontium	Negligible - no thresholds exceeded
Cadmium	Negligible - no thresholds exceeded

* = Specific thresholds for lowest adverse effect level are unknown.
COPECs = Constituents of potential ecological concern.

Table 6-2. Summary of Refined Hazard Quotients Exceeding 1 from Refined Deterministic Dietary Exposure Model
 Tennessee Valley Authority Kingston, Tennessee

Receptors of Interest	Feeding Guide	COPEC	NOAEL and LOAEL Hazard Quotients (HQ) > 1									
			Reach									
			ER_A	ER_B	ER_C	ER_R	CR_A	CR_B	CR_R	TR_A	TR_B	TR_R
Aquatic and Riparian Feeding Birds												
Wood Duck	Herbivore	--	--	--	--	--	--	--	--	--	--	--
Mallard	Omnivore	Selenium	0.8 - 2	--	--	--	--	--	--	--	--	--
Killdeer	Invertivore	Aluminum	0.7 - 3	0.9 - 3	0.5 - 2	0.5 - 2	0.9 - 3	0.8 - 3	0.6 - 2	0.9 - 3	0.9 - 3	0.8 - 3
		Arsenic	1 - 3	--	--	--	--	--	--	--	--	--
		Selenium	2 - 5	1 - 3	0.9 - 2	0.8 - 2	1 - 3	1 - 3	0.9 - 2	1 - 2	1 - 2	0.9 - 2
Great Blue Heron	Piscivore	--	--	--	--	--	--	--	--	--	--	--
Osprey	Piscivore	--	--	--	--	--	--	--	--	--	--	--
Aquatic and Riparian Feeding Mammals												
Muskrat	Herbivore	Aluminum	--	--	--	0.2 - 3	0.1 - 2	--	0.1 - 2	--	--	0.1 - 2
Raccoon	Omnivore	Aluminum	0.1 - 2	0.2 - 2	0.1 - 2	0.2 - 2	0.2 - 3	0.1 - 2	0.2 - 2	0.2 - 3	0.2 - 2	0.2 - 2
Mink	Piscivore	Aluminum	0.2 - 2	0.2 - 3	--	0.2 - 2	0.3 - 3	0.1 - 2	0.09 - 1	0.3 - 3	0.3 - 3	0.1 - 1
		Iron	1 - 2	1 - 2	--	2 - 2	--	--	--	--	--	--
Aerial Feeding Insectivore Birds and Mammals												
Tree Swallow	Aerial Bird Insectivore	Copper	--	--	0.6 - 2	0.6 - 1	0.6 - 2	--	0.6 - 2	0.5 - 2	--	0.5 - 2
		Selenium	2 - 5	2 - 5	2 - 5	1 - 3	2 - 4	2 - 4	1 - 3	1 - 2	1 - 3	0.6 - 1
Gray Bat	Aerial Mammal Insectivore	Selenium	6 - 9	7 - 10	6 - 10	3 - 5	6 - 9	5 - 8	3 - 5	3 - 5	3 - 5	2 - 2

Highlighted gray means HQ > 1 and > reference reach of same river.

Reference reach numbers are grayed out since not elevated from ash but shown if HQ > 1.

- X_X = River_Reach.
- ER = Emory River.
- CR = Clinch River.
- TR = Tennessee River.
- COPEC = Constituent of Potential Ecological Concern.
- LOAEL = Lowest Observed Adverse Effect Level.
- NOAEL = No Observed Adverse Effect Level.



Table 6-3. Summary of Probability of Exceeding Hazard Quotient of 1 from Refined Probabilistic Dietary Exposure Models
 Tennessee Valley Authority Kingston, Tennessee

Receptors of Interest	Feeding Guild	COPEC	Probability of Exceeding 1 for the NOAEL and LOAEL Hazard Quotients									
			Reach									
			ER_A	ER_B	ER_C	ER_R	CR_A	CR_B	CR_R	TR_A	TR_B	TR_R
Aquatic and Riparian Feeding Birds												
Mallard	Omnivore	Selenium	0.002-0.02	--	--	--	--	--	--	--	--	--
Killdeer	Invertivore	Aluminum	0.03-1	0.05-0.9		0.01-0.3	0.1-1	0-1	0.02-0.7	--	--	--
		Arsenic	0.05-0.1	--	--	--	--	--	--	--	--	--
		Selenium	0.1-0.24	0.05-0.1		0.06 - 0.02	0.05-0.1	0.06-0.1	0.04-0.1	--	--	--
Aquatic and Riparian Feeding Mammals												
Raccoon	Omnivore	Aluminum	--	--	--	--	0.06-0.6	--	0.05-0.5	0.07-0.7	--	0.06-0.6
Mink	Piscivore	Aluminum	--	0.05-0.4	--	0.06-0.5	0.07-0.6	0.05-0.4	0.03-0.2	--	--	--
Aerial Feeding Insectivore Birds and Mammals												
Tree Swallow	Aerial Bird Insectivore	Selenium	0.1-0.3	0.1-0.3	0.1-0.3	0.05-0.1	0.1-0.2	0.1-0.2	0.05-0.1	0.04-0.1	0.05-0.1	0.02-0.04
Gray Bat	Aerial Mammal Insectivore	Selenium	0.007-0.009	0.007-0.01	0.006-0.008	0-0.002	0.003-0.005	0.005-0.005	0 - 0	0-0.002	0	0

Reference reach numbers are grayed out since not elevated from ash but shown as a comparison.

X_X = River_Reach.
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COPEC = Constituent of Potential Ecological Concern.
 LOAEL = Lowest Observed Adverse Effect Level.
 NOAEL = No Observed Adverse Effect Level.



Table 6-4. Percent Contribution to Aluminum or Selenium Dose for Each Diet Component*
Tennessee Valley Authority Kingston, Tennessee

% Contribution to Dose and Thus Risk							
	Sediment	Surface Water	Benthic Invertebrates	Vegetation	Fish	Frog	Total
	Mink Aluminum						
ER_A	1.13%	<1%	27.41%	1.2%	70.13%	0.1%	100%
ER_B	0.93%	<1%	45.83%	1.3%	51.73%	0.2%	100%
ER_C	1.07%	<1%	59.43%	7.5%	31.58%	0.4%	100%
ER_R	0.41%	<1%	21.20%	7.8%	70.41%	0.2%	100%
CR_A	1.74%	<1%	31.71%	1.8%	64.56%	0.1%	100%
CR_B	1.46%	<1%	42.78%	1.8%	53.81%	0.2%	100%
CR_R	0.81%	<1%	60.23%	7.0%	31.67%	0.3%	100%
TR_A	1.69%	<1%	33.63%	1.8%	62.77%	0.1%	100%
TR_B	1.69%	<1%	33.68%	1.8%	62.70%	0.1%	100%
TR_R	0.75%	<1%	63.35%	6.4%	29.19%	0.3%	100%

*Based on means of abiotic and tissue samples for each reach.
 % = Percent.
 ER = Emory River.
 CR = Clinch River.
 TR = Tennessee River.



Table 6-4. Percent Contribution to Aluminum or Selenium Dose for Each Diet Component*
Tennessee Valley Authority Kingston, Tennessee

% Contribution to Dose and Thus Risk						
	Sediment	Surface Water	Benthic Invertebrates	Vegetation	Fish	Total
Raccoon Aluminum						
ER_A	0.96%	<1%	90.28%	6.51%	2.25%	100.00%
ER_B	0.49%	<1%	94.02%	4.46%	1.03%	100.00%
ER_C	0.38%	<1%	82.09%	17.11%	0.42%	100.00%
ER_R	0.30%	<1%	60.73%	37.00%	1.96%	100.00%
CR_A	1.25%	<1%	88.49%	8.51%	1.75%	100.00%
CR_B	0.81%	<1%	91.86%	6.21%	1.13%	100.00%
CR_R	0.29%	<1%	83.34%	15.95%	0.43%	100.00%
TR_A	1.16%	<1%	89.45%	7.77%	1.63%	100.00%
TR_B	1.15%	<1%	89.38%	7.86%	1.62%	100.00%
TR_R	0.26%	<1%	85.10%	14.27%	0.38%	100.00%

*Based on means of abiotic and tissue samples for each reach.
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Table 6-4. Percent Contribution to Aluminum or Selenium Dose for Each Diet Component*
Tennessee Valley Authority Kingston, Tennessee

% Contribution to Dose and Thus Risk						
	Sediment	Surface Water	Benthic Invertebrates	Sediment	Surface Water	Benthic Invertebrates
	Killdeer Aluminum			Killdeer Selenium		
ER_A	2.10%	<1%	97.90%	1.67%	<1%	98.33%
ER_B	1.04%	<1%	98.96%	2.22%	<1%	97.78%
ER_C	0.93%	<1%	99.07%	3.05%	<1%	96.95%
ER_R	1.00%	<1%	99.00%	4.10%	<1%	95.90%
CR_A	2.78%	<1%	97.22%	2.15%	<1%	97.85%
CR_B	1.75%	<1%	98.25%	2.13%	<1%	97.87%
CR_R	0.69%	<1%	99.31%	3.14%	<1%	96.86%
TR_A	2.55%	<1%	97.45%	2.57%	<1%	97.43%
TR_B	2.55%	<1%	97.45%	2.42%	<1%	97.58%
TR_R						

*Based on means of abiotic and tissue samples for each reach.
 % = Percent.
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