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Kingston Ash Recovery Project
Non-Time-Critical Removal Action

River System Sampling and Analysis Plan
Task Completion Technical Memorandum
Tree Swallow Sampling

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Appendix A: Summary of Tree Swallow Collections
Appendix B: Summary of Insectivorous Bird Shipments

List of Acronyms

COC	chain-of-custody
CRM	Clinch River Mile
DQO	data quality objective
EDD	electronic data deliverable
EE/CA	Engineering Evaluation/Cost Analysis
EEMBAY	East Embayment
ERM	Emory River Mile
FLD	Fort Loudoun Dam
KIF	Kingston Fossil Plant
LERM	Lower Emory River Mile
MDL	method detection limit
mg/kg	milligram per kilogram
MHD	Melton Hill Dam
NA	not applicable
NEMBAY	North Embayment
ND	not detected
Pace	Pace Analytical Services, Inc.
QC	quality control
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
TDL	Tellico Dam
TM	Technical Memorandum
TVA	Tennessee Valley Authority
WEMBAY	West Embayment
WP	Work Package

1. PURPOSE

The purpose of this Technical Memorandum (TM) is to summarize the completion of the 2009 and 2010 insectivorous bird sampling as described in the approved *Kingston Ash Recovery Project Non-Time-Critical Removal Action for the River System Sampling and Analysis Plan* (SAP), Rev. 3, May 24, 2010, Document No. EPA-AO-021. This TM is one of a series being prepared to summarize the field work and data collection activities as SAP tasks are completed. The TM series is intended to provide interim presentations of data that will become the basis for the nature and extent of contamination section of the River System Engineering Evaluation/Cost Analysis (EE/CA) Report. No data evaluation or conclusions are presented.

2. BACKGROUND

The data quality objective (DQO) problem statement for insectivorous bird sampling is:

> Naturally-occurring metals (e.g., arsenic and selenium) in ash may accumulate in wildlife (aquatic- and riparian-feeding birds and mammals) inhabiting the river system to concentrations that pose an unacceptable risk to these ecological receptors or ecological receptors who regularly consume these organisms.

Section 2.2.9 of the SAP discusses the design of the avian egg and nestling sampling studies. Concentrations of metals detected in bird eggs and nestlings are commonly used as biomarkers of exposure to these constituents. In order to estimate the potential bioaccumulation of ash-related constituents in wildlife, the concentrations of those constituents needed to be determined. While sampling of eggshells was not required for the SAP, concentrations of metals in these samples will also be considered as biomarkers of exposure. Effects of exposure to some constituents have been described in scientific literature and will be used when available. When possible, the metal concentrations in eggs and nestlings will be compared between impacted and unimpacted sites as well as between years. Elevated concentrations at impacted sites and changes in concentrations over time may indicate environmental stress and potential risk to tree swallows.

Insectivorous bird egg and nestlings sampling began in 2009, approximately five months after the spill, in order to provide baseline concentrations for future site comparisons. These sampling efforts were continued and expanded in 2010. The target species during both years of study was the tree swallow (*Tachycineta bicolor*). When possible, nests located around the ash impacted area near the Kingston Fossil Plant (KIF), downstream of the ash impacted area, and upstream of the ash impacted area (reference site) were sampled. One egg was collected from each occupied, accessible nest, with a target number in each area of 10 eggs in 2009 and 15 eggs in 2010. In addition, one 15-day nestling was collected from each occupied, accessible nest, with a target number in each area of 10 nestlings in 2009 and 15 nestlings in 2010. When possible, egg and nestling collections were collocated from the same nest.

In 2009, five colonies of tree swallows were established at three potentially impacted areas immediately around the ash spill and at two unimpacted areas (reference locations) away from the ash spill. Colony sites consisted of newly installed boxes and existing bird boxes. A total of 81 boxes were sampled in 2009. In 2010, the tree swallow study was expanded to include colonies at a total of nine potentially impacted areas as well as downstream on the Clinch and Tennessee Rivers, and a total of five unimpacted areas at nearby reference locations and upstream on the Tennessee River. In addition to increasing the number of established colonies, predator guards were also placed around the poles of each bird box in an effort to reduce predation of bird boxes. The number of monitored boxes increased from 81 in 2009 to 530 in 2010.

3. SAMPLING AND ANALYSIS ACTIVITIES

Field activities occurred in the spring of 2009 and 2010 in accordance with Standard Operating Procedure (SOP) TVA-KIF-SOP-28 *Sampling Tree Swallow Eggs and Nestlings*. Tree swallow egg and nestling sampling was conducted from April 27 through July 24, 2009 and from May 3 through July, 12, 2010. In 2009, all of the boxes were typically monitored weekly or bi-weekly. During 2010, most boxes were monitored bi-weekly or monthly, however a subset of target boxes at the five original 2009 sites were monitored daily. These five sites were the focus for egg and nestling collections; however, when possible, eggs were collected from all established colonies. Field crew accessed nests boxes on foot or by boat. One egg was randomly selected from each nest, sealed in a labeled plastic container for transport, and cooled on ice. Clutch size was recorded at time of collection. Eggs were processed, which included weighing and measuring length and width. After processing, each egg was repackaged in a labeled plastic bag, placed in a labeled glass jar, and then frozen. In addition to these egg collections, efforts were made in 2010 to collect un-hatched "dud" eggs remaining in tree swallow nests at the end of the breeding season. These eggs were collected and processed as previously noted. Once at the lab, a subset of 20 egg shells was selected and also analyzed for metals. This subset included egg shells from potentially impacted areas (13 eggs) and from reference areas (7 eggs).

Similarly, one nestling ≥ 15 days old was randomly selected from each nest and placed individually in a labeled, plastic bag. Clutch size and nestling survival were also recorded at the time of collection. The open bag was then placed in an insulated box with dry ice for euthanasia. Once the specimen was euthanized, the bag was sealed and cooled on ice until processing. Nestlings were processed (weighed, measured length of tarsus and third primary feather), within 24 hours of collection. After processing, each specimen was repackaged in a clean plastic bag, sealed, and frozen. When feasible, nestlings that were found dead in nest boxes during monitoring activities were also collected, sealed in labeled plastic bags, placed on ice, and processed in the same manner as other nestlings noted previously. Samples were then shipped to Pace Analytical Services, Inc. (Pace), Green Bay, Wisconsin on dry ice for chemical analysis. In addition to the field samples, crews collected quality control (QC) samples. Since a true field duplicate is not feasible for biological sampling, co-located samples were taken in 2009 and 2010 by collecting two eggs from one randomly selected nest. In 2009, two nestlings were also collected from one randomly selected nest; however, this was not continued in 2010 as it was not required. Co-located samples were analyzed as part of the data set. Field collection activities for 2009 and 2010 are summarized in Table 1.

Table 1. Summary of Tree Swallow Egg and Nestling Field Activities

Summary	2009	2010
Field collection period	April 27 through July 24	May 3 through July 12
Number egg samples collected[1]	63	164
Number nestling samples collected[1]	47	67
Number QC samples collected	2	1
Frequency of QC sampling	Once per species per season	Once per species per season

Note: [1]See Appendix A for collection details.

Sampling and analysis were performed in accordance with the *Quality Assurance Project Plan for the Tennessee Valley Authority Kingston Ash Recovery Project* hereinafter referred to as the TVA-KIF-QAPP, the listed SOPs, field guides, and work packages. Table 2 identifies the applicable TVA Documents and SOPs associated with tree swallow egg and nestling sampling.

All field and QC samples were shipped to Pace for analysis (see Appendix B for shipping details). Egg, nestling, and eggshells samples were analyzed for a suite of 26 metals and percent moisture (when sufficient mass remained after metals analysis).

Table 2. Applicable TVA Documents and Standard Operating Procedures

Document	Document Number
TVA KIF Ash Recovery Project Quality Assurance Project Plan	TVA-KIF-QAPP
TVA-KIF Work Package: Tree Swallow Bird Box Installation	WP-1007
TVA-KIF Work Package: Tree Swallow Nest Box Monitoring and Egg/Hatchling Sampling	WP-1014
TVA-KIF Work Package: Tree Swallow Bird Box Removal, Disassemble and Storage	WP-1060
STANDARD OPERATION PROCEDURES	
Sampling Tree Swallow Eggs and Nestlings	TVA-KIF-SOP-28
Field Documentation	TVA-KIF-SOP-06
Sample Labeling, Packing, and Shipping	TVA-KIF-SOP-07
Decontamination of Equipment	TVA-KIF-SOP-08
Field quality control sampling	TVA-KIF-SOP-11
Management and Implementation of EQuIS™-Based Chain-of-Custody	TVA-KIF-SOP-18
FIELD CHANGE NOTICES	
Tree Swallow Box Locations	FCN-010
Egg Shell Analysis	FCN-009

Note: For definitions, see the Acronyms section.

4. SUMMARY OF CHANGES

Field Change Notices (FCNs) were prepared to document deviations from the SAP. FCNs were prepared and approved for the revision of tree swallow box locations and for the addition of eggshell analysis.

Tree swallow colonies were established at multiple locations around the site in order to support ongoing ecological studies at the Kingston Ash Recovery Project. These locations included two background reference locations (Fort Loudoun Dam and Melton Hill Dam) and three onsite locations (one near Clinch River Mile (CRM) 2.5 and two near Emory River Mile (ERM) 3.0). Colonies were also established near ERM 2.5, CRM 1.0, and Tennessee River Mile 566.0. Egg collections were made from these colonies when possible. Appendix A incorrectly stated that collections of eggs and nestlings would be made from two background reference locations (Fort Loudoun Dam and Melton Hill Dam) and six colonies (near CRM 2.5, CRM 3.5, ERM 1.5, ERM 2.5, and two near ERM 3.0). FCN-010 documents this correction.

In addition, a subset of tree swallow egg shells was analyzed for metals. Some trace elements, such as strontium which is a calcium analog, have the potential to be particularly elevated in the egg shell (a calcium-rich matrix) and can provide an additional line of evidence regarding trace element bioavailability, bioaccumulation, and maternal transport near the spill site. As a result, 20 tree swallow eggs were selected for analysis from potentially impacted areas and from reference areas (FCN-009).

5. ANALYTICAL DATA REVIEW

TVA's contracted laboratories were required to submit three types of deliverables: a limited (Level 1) data package containing sample results and batch QC sample results; a fully- documented (Level 4) data package including raw data for all analyses; and electronic data deliverables (EDDs) for storage in TVA's EarthSoft EQuIS® database.

EDDs were subjected to completeness and correctness testing during loading to TVA's EQuIS database; once loaded to the EQuIS database, the data were subjected to verification. As defined in the TVA-KIF-QAPP, data verification involved comparison of the data loaded in the EQuIS database to the results reported in the Level 1 data package. In addition, data verification included review of the batch QC summary forms for compliance with the applicable methods and for data usability with respect to the project DQOs and the TVA-KIF-QAPP.

Following receipt of the Level 4 data package, data were subjected to validation. As defined in the TVA-KIF-QAPP, data validation included review of raw data and associated QC summary forms for compliance with the applicable methods and for data usability with respect to the appropriate guidance documents. As stated in the TVA-KIF-QAPP: "Initially, 100% of the chemical analysis data will be reported in full documentation data packages for independent data validation. Depending on the nature and frequency of issues identified during data validation, the percentage of data undergoing full data validation may be reduced to a lesser percentage (such as 20%) or data verification may be substituted. The reduction in full data validation may be matrix specific, laboratory specific, or analyte specific. If after the percentage of full data validation has decreased, a trend in frequency of reporting issues, method non-compliances, or data usability issues is identified, data validation will be conducted for specific data points or the percentage of full data validation percentage may be increased until the issues have been minimized to their initial frequency." Data validation expands upon the completeness, correctness, and usability assessment performed during verification to include evaluation of instrumental QC analyses, review of sample preparation information, and recalculation of reported results from raw data. A summary of the data review effort is presented in Table 3.

Table 3. Data Review Summary

No. COCs	Matrix	No. Samples	No. Equipment Blank Samples	No. Analytical Results	Percentage Validated
73	Egg	218	0	5,719	100%
	Nestling	112		3,023	
	Dud Egg	9		234	
	Dead Nestling	2		54	
	Egg Shells	20		520	
Total	**-**	**361**	**0**	**9,550**	**-**

Note: For definitions, see the Acronyms section.

6. DATA QUALITY SUMMARY

Data validation was performed based on the sample results, summary QC data, and raw data provided by the laboratory. Data validation includes a review of the following QC measures (where applicable):

- Sample condition upon laboratory receipt;

- Initial calibration linearity;
- Blank analysis results greater than the method detection limit (MDL);
- Sample preparation and holding times;
- Initial calibration verification/continuing calibration verification standard recoveries;
- Inductively coupled plasma interference check standard results;
- MDLs and linear ranges;
- Internal standard recoveries;
- Percent moisture;
- Pre and post matrix spike/matrix spike duplicate;
- Laboratory and field duplicate precision;
- Quantitation of positive results;
- Laboratory control sample/laboratory control sample duplicate recoveries and precision;
- Analytical sequence;
- Reporting limit standard recoveries;
- MDL verification standards; and
- Standard reference material recoveries.

The data met the DQOs defined for this task and are acceptable for use. Table 4 summarizes the data quality based on the review performed and as compared to the data quality measures identified in the TVA-KIF-QAPP. The text of the data validation reports for the samples included in this TM will be included in the EE/CA Report.

Table 4. Summary of Tree Swallow Egg and Nestling Data Quality

Matrix	Analytical Results (Total Count)	Acceptable (No Qualification)[a]		Acceptable (Estimated)[b]		Blank Qualified[c]		Rejected[d,e]	
Egg	5,719	4,514	*79%*	956	*17%*	165	*3%*	84	*1%*
Nestling	3,023	2,511	*83%*	418	*14%*	92	*3%*	2	*<1%*
Dud Egg	234	181	*77%*	52	*22%*	1	*<1%*	0	*0%*
Dead Nestling	54	36	*66%*	14	*26%*	2	*4%*	2	*4%*
Egg Shells	520	403	*78%*	107	*21%*	10	*1%*	0	*0%*

Notes:

[a]Acceptable, No Qualification – Qualification of data was not warranted based on a review of the applicable QC measures.

[b]Acceptable, Estimated – Quantitation or detection limit is approximate due to limitations or bias identified during a review of the applicable QC measures.

[c]Blank Qualified – Result is considered "not-detected" because it was detected in an associated blank at a similar level.

[d]Rejected – Unreliable result or detection limit; analyte may or may not be present in sample.

[e]Most results are percent moisture results qualified as unusable due to limited sample mass and/or extended frozen storage prior to moisture determination.

7. DATA SUMMARY

Summary statistics for tree swallow eggs, eggshells, and nestlings are provided in Tables 5 through 41 for each location collected in 2009 and 2010. Rejected percent moisture results were due to small sample sizes and uncertainty in holding times; as a result, the data for each species are presented in wet weight until the percent moistures issues have been clarified.

Table 5. 2009 Tree Swallow Egg Sampling at Emory River Mile 3.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	24.72 / 29.1	ND	ND	ND			0 / 10	0
Antimony	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Arsenic	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Barium	mg/kg		0.6175	0.6175	16.42	RESIDENTIAL10	05/08/2009	10 / 10	3.198
Beryllium	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Boron	mg/kg	1.98 / 2.3	ND	ND	ND			0 / 10	0
Cadmium	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Calcium	mg/kg		479.6	479.6	1290	RESIDENTIAL01	05/08/2009	10 / 10	883.3
Chromium	mg/kg	0.09801 / 0.1308	ND	ND	ND			0 / 10	0
Cobalt	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Copper	mg/kg	0.4875 / 0.58	ND	0.4875	0.62	RESIDENTIAL02	05/28/2009	2 / 10	0.5538
Iron	mg/kg	24.72 / 24.99	ND	28.73	73.71	RESIDENTIAL04	05/08/2009	8 / 10	44.09
Lead	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Magnesium	mg/kg	98.98 / 103	ND	100.7	138	RESIDENTIAL01	05/08/2009	3 / 10	119.7
Manganese	mg/kg		0.7475	0.7475	2.052	RESIDENTIAL10	05/08/2009	10 / 10	1.216
Mercury	mg/kg	0.01962 / 0.036	ND	0.0321	0.0321	RESIDENTIAL07	05/08/2009	1 / 10	0.0321
Molybdenum	mg/kg	0.9801 / 1.2	ND	ND	ND			0 / 10	0
Nickel	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Potassium	mg/kg		1106	1106	1780	RESIDENTIAL02	05/28/2009	10 / 10	1372
Selenium	mg/kg		0.5004	0.5004	1.287	RESIDENTIAL04	05/08/2009	10 / 10	0.7606
Silver	mg/kg	0.04875 / 0.058	ND	ND	ND			0 / 10	0
Sodium	mg/kg		1240	1240	1528	RESIDENTIAL06	05/08/2009	10 / 10	1407
Strontium	mg/kg		0.7089	0.7089	3.709	RESIDENTIAL10	05/08/2009	10 / 10	1.568
Thallium	mg/kg	0.09801 / 0.12	ND	ND	ND			0 / 10	0
Vanadium	mg/kg	0.1962 / 0.23	ND	ND	ND			0 / 10	0
Zinc	mg/kg		11.88	11.88	35.5	RESIDENTIAL01	05/08/2009	10 / 10	22.01

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 6. 2010 Tree Swallow Egg Sampling at Emory River Mile 3.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.7 / 10.6	ND	ND	ND			0 / 25	0
Antimony	mg/kg	0.014 / 0.038	ND	0.044	0.044	ERM3.0	05/12/2010	1 / 30	0.044
Arsenic	mg/kg	0.027 / 0.15	ND	ND	ND			0 / 30	0
Barium	mg/kg		0.3	0.3	4.8	ERM3.0	05/12/2010	30 / 30	1.595
Beryllium	mg/kg	0.028 / 0.078	ND	ND	ND			0 / 30	0
Boron	mg/kg	0.39 / 1.1	ND	ND	ND			0 / 30	0
Cadmium	mg/kg	0.0073 / 0.048	ND	0.01	0.01	ERM3.0	06/03/2010	1 / 30	0.01
Calcium	mg/kg		465	465	5250	ERM3.0	05/18/2010	30 / 30	1422
Chromium	mg/kg	0.12 / 0.34	ND	0.13	0.27	ERM3.0	05/12/2010	4 / 30	0.2
Cobalt	mg/kg	0.013 / 0.035	ND	0.014	0.075	ERM3.0	05/05/2010	20 / 30	0.02855
Copper	mg/kg		0.38	0.38	0.74	ERM3.0	05/05/2010	30 / 30	0.5453
Iron	mg/kg		18.5	18.5	132	ERM3.0	05/05/2010	30 / 30	40.38
Lead	mg/kg	0.027 / 0.074	ND	ND	ND			0 / 30	0
Magnesium	mg/kg	45 / 121	ND	60	274	ERM3.0	05/05/2010	29 / 30	106
Manganese	mg/kg		0.54	0.54	5.8	ERM3.0	05/05/2010	30 / 30	1.468
Mercury	mg/kg	0.011 / 0.068	ND	0.025	0.048	ERM3.0	05/12/2010	7 / 30	0.03871
Molybdenum	mg/kg	0.033 / 0.093	ND	0.036	0.055	ERM3.0	05/05/2010	5 / 30	0.0442
Nickel	mg/kg	0.091 / 0.24	ND	0.12	6.2	ERM3.0	05/05/2010	11 / 30	2.304
Potassium	mg/kg		1270	1270	2030	ERM3.0	05/12/2010	30 / 30	1682
Selenium	mg/kg		0.45	0.45	2.4	ERM3.0	05/05/2010	30 / 30	0.8737
Silver	mg/kg	0.0027 / 0.0077	ND	0.0046	0.0075	ERM3.0	05/12/2010	2 / 30	0.00605
Sodium	mg/kg		1520	1520	2290	ERM3.0	05/05/2010	30 / 30	1852
Strontium	mg/kg		0.57	0.57	6.1	ERM3.0	05/18/2010	30 / 30	1.665
Thallium	mg/kg	0.013 / 0.036	ND	ND	ND			0 / 30	0
Vanadium	mg/kg	0.012 / 0.24	ND	ND	ND			0 / 30	0

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 7. 2009 Tree Swallow Egg Sampling at Emory River Mile 3.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	24.75 / 47.9	ND	ND	ND			0 / 15	0
Antimony	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Barium	mg/kg	0.0988 / 0.12	ND	0.414	4.1	FARM06	06/04/2009	14 / 15	1.562
Beryllium	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Boron	mg/kg	1.976 / 3.8	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Calcium	mg/kg		124	124	5115	FARM03	05/08/2009	15 / 15	2102
Chromium	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Cobalt	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Copper	mg/kg	0.4887 / 0.64	ND	0.4995	2.2	FARM06	06/04/2009	7 / 15	0.8787
Iron	mg/kg	24.75 / 29.7	ND	28.9	94.4	FARM06	06/04/2009	9 / 15	45.64
Lead	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Magnesium	mg/kg	98.8 / 129	ND	101.6	330	FARM06	06/04/2009	4 / 15	169.9
Manganese	mg/kg	0.4887 / 0.59	ND	0.56	3.6	FARM06	06/04/2009	10 / 15	1.558
Mercury	mg/kg	0.01932 / 0.026	ND	0.03328	0.092	FARM06	06/04/2009	3 / 15	0.0551
Molybdenum	mg/kg	0.988 / 1.9	ND	ND	ND			0 / 15	0
Nickel	mg/kg	0.0988 / 0.19	ND	0.1042	0.1042	FARM10	05/08/2009	1 / 15	0.1042
Potassium	mg/kg		976	976	6080	FARM06	06/04/2009	15 / 15	1696
Selenium	mg/kg	0.1932 / 0.24	ND	0.442	2	FARM06	06/04/2009	14 / 15	0.714
Silver	mg/kg	0.04887 / 0.096	ND	ND	ND			0 / 15	0
Sodium	mg/kg		1258	1258	8020	FARM06	06/04/2009	15 / 15	1990
Strontium	mg/kg		0.2	0.2	4.325	FARM03	05/08/2009	15 / 15	1.838
Thallium	mg/kg	0.0988 / 0.19	ND	ND	ND			0 / 15	0
Vanadium	mg/kg	0.1932 / 0.38	ND	ND	ND			0 / 15	0
Zinc	mg/kg	1.976 / 2.4	ND	7.254	58.1	FARM06	06/04/2009	14 / 15	20.21

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 8. 2010 Tree Swallow Egg Sampling at Emory River Mile 3.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.6 / 4.1	ND	6.2	6.2	ERM3.5	05/12/2010	1 / 12	6.2
Antimony	mg/kg	0.013 / 0.015	ND	ND	ND			0 / 12	0
Arsenic	mg/kg	0.027 / 0.058	ND	ND	ND			0 / 12	0
Barium	mg/kg		0.41	0.41	2.8	ERM3.5	05/18/2010	12 / 12	1.155
Beryllium	mg/kg	0.026 / 0.06	ND	ND	ND			0 / 12	0
Boron	mg/kg	0.37 / 1.26	ND	1.2	1.2	ERM3.5	05/12/2010	1 / 12	1.2
Cadmium	mg/kg	0.0073 / 0.016	ND	ND	ND			0 / 12	0
Calcium	mg/kg		520	520	937	ERM3.5	05/18/2010	12 / 12	749.9
Chromium	mg/kg	0.11 / 0.13	ND	0.14	1	ERM3.5	06/03/2010	3 / 12	0.4567
Cobalt	mg/kg	0.013 / 0.014	ND	0.015	0.025	ERM3.5	05/07/2010	9 / 12	0.01933
Copper	mg/kg		0.37	0.37	0.8	ERM3.5	05/06/2010	12 / 12	0.4933
Iron	mg/kg		17	17	47.8	ERM3.5	05/18/2010	12 / 12	29.4
Lead	mg/kg	0.025 / 0.083	ND	ND	ND			0 / 12	0
Magnesium	mg/kg		59.4	59.4	107	ERM3.5	05/07/2010	12 / 12	83.1
Manganese	mg/kg		0.61	0.61	1.8	ERM3.5	05/11/2010	12 / 12	1.132
Mercury	mg/kg	0.011 / 0.044	ND	0.028	0.052	ERM3.5	06/03/2010	6 / 12	0.03767
Molybdenum	mg/kg	0.031 / 0.036	ND	ND	ND			0 / 12	0
Nickel	mg/kg	0.087 / 0.1	ND	0.5	1.2	ERM3.5	05/07/2010	2 / 12	0.85
Potassium	mg/kg		1240	1240	1680	ERM3.5	05/06/2010	12 / 12	1502
Selenium	mg/kg		0.39	0.39	0.77	ERM3.5	05/12/2010	12 / 12	0.58
Silver	mg/kg	0.0026 / 0.01	ND	ND	ND			0 / 12	0
Sodium	mg/kg		1350	1350	1990	ERM3.5	05/18/2010	12 / 12	1737
Strontium	mg/kg		0.59	0.59	1.4	ERM3.5	05/07/2010	12 / 12	0.8792
Thallium	mg/kg	0.012 / 0.041	ND	ND	ND			0 / 12	0
Vanadium	mg/kg	0.044 / 0.094	ND	ND	ND			0 / 12	0
Zinc	mg/kg		11.7	11.7	27.2	ERM3.5	05/18/2010	12 / 12	17.77

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 9. 2009 Tree Swallow Egg Sampling at Clinch River Mile 2.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		67.4	67.4	81.4	DISCHARGE04	06/01/2009	2 / 2	74.4
Aluminum	mg/kg	24.29 / 48.8	ND	ND	ND			0 / 12	0
Antimony	mg/kg	0.09761 / 0.2	ND	ND	ND			0 / 12	0
Arsenic	mg/kg	0.09761 / 0.2	ND	ND	ND			0 / 12	0
Barium	mg/kg		0.6303	0.6303	2.539	DISCHARGE08	05/08/2009	12 / 12	1.581
Beryllium	mg/kg	0.09761 / 0.2	ND	ND	ND			0 / 12	0
Boron	mg/kg	1.952 / 3.9	ND	ND	ND			0 / 12	0
Cadmium	mg/kg	0.09761 / 0.2	ND	ND	ND			0 / 12	0
Calcium	mg/kg		425.3	425.3	14849	DISCHARGE08	05/08/2009	12 / 12	4037
Chromium	mg/kg	0.09761 / 0.2418	ND	ND	ND			0 / 12	0
Cobalt	mg/kg	0.09761 / 0.2	ND	ND	ND			0 / 12	0
Copper	mg/kg	0.4767 / 0.993	ND	0.4994	2.836	DISCHARGE03	06/04/2009	6 / 12	1.002
Iron	mg/kg	24.29 / 48.8	ND	27.71	79.44	DISCHARGE03	06/16/2009	6 / 12	46.94
Lead	mg/kg	0.09761 / 0.2	ND	0.1646	0.1646	DISCHARGE06	05/08/2009	1 / 12	0.1646
Magnesium	mg/kg	97.38 / 195	ND	99	258.8	DISCHARGE03	06/04/2009	6 / 12	145.5
Manganese	mg/kg	0.4767 / 2.1	ND	0.4767	3.376	DISCHARGE03	06/16/2009	9 / 12	1.286
Mercury	mg/kg	0.0191 / 0.039	ND	0.02079	0.03632	DISCHARGE05	06/16/2009	2 / 12	0.02856
Molybdenum	mg/kg	0.9761 / 2	ND	ND	ND			0 / 12	0
Nickel	mg/kg	0.09761 / 0.2	ND	ND	ND			0 / 12	0
Potassium	mg/kg		1068	1068	2106	DISCHARGE03	06/04/2009	12 / 12	1511
Selenium	mg/kg		0.4536	0.4536	1.258	DISCHARGE03	06/16/2009	12 / 12	0.7063
Silver	mg/kg	0.04767 / 0.0993	ND	ND	ND			0 / 12	0
Sodium	mg/kg		1099	1099	2269	DISCHARGE04	06/01/2009	12 / 12	1579
Strontium	mg/kg		0.6426	0.6426	9.467	DISCHARGE08	05/08/2009	12 / 12	3.18
Thallium	mg/kg	0.09761 / 0.2	ND	ND	ND			0 / 12	0
Vanadium	mg/kg	0.191 / 0.39	ND	ND	ND			0 / 12	0
Zinc	mg/kg		6.924	6.924	43.63	DISCHARGE03	06/16/2009	12 / 12	19.19

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 10. 2010 Tree Swallow Egg Sampling at Clinch River Mile 2.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Antimony	mg/kg	0.012 / 0.041	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.024 / 0.08	ND	ND	ND			0 / 15	0
Barium	mg/kg		0.34	0.34	2.6	CRM2.5	05/05/2010	15 / 15	1.053
Beryllium	mg/kg	0.025 / 0.084	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.35 / 1.2	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.0065 / 0.022	ND	ND	ND			0 / 15	0
Calcium	mg/kg		594	594	9400	CRM2.5	05/05/2010	15 / 15	1758
Chromium	mg/kg	0.11 / 0.36	ND	ND	ND			0 / 15	0
Cobalt	mg/kg	0.012 / 0.04	ND	0.012	0.041	CRM2.5	05/05/2010	10 / 15	0.0235
Copper	mg/kg		0.34	0.34	0.93	CRM2.5	05/05/2010	15 / 15	0.6013
Iron	mg/kg	10.3 / 34.2	ND	20.6	46.3	CRM2.5	05/05/2010	13 / 15	30.1
Lead	mg/kg	0.024 / 0.079	ND	ND	ND			0 / 15	0
Magnesium	mg/kg	41.3 / 137	ND	61.8	111	CRM2.5	05/05/2010	14 / 15	90.04
Manganese	mg/kg		0.61	0.61	1.8	CRM2.5	05/05/2010	15 / 15	0.9973
Mercury	mg/kg	0.024 / 0.055	ND	ND	ND			0 / 15	0
Molybdenum	mg/kg	0.059 / 0.2	ND	ND	ND			0 / 15	0
Nickel	mg/kg	0.084 / 0.28	ND	ND	ND			0 / 15	0
Potassium	mg/kg		1470	1470	2270	CRM2.5	05/05/2010	15 / 15	1807
Selenium	mg/kg		0.45	0.45	1.1	CRM2.5	05/05/2010	15 / 15	0.7067
Silver	mg/kg	0.0025 / 0.0082	ND	ND	ND			0 / 15	0
Sodium	mg/kg		1520	1520	2320	CRM2.5	05/05/2010	15 / 15	1891
Strontium	mg/kg		0.62	0.62	5.1	CRM2.5	05/05/2010	15 / 15	1.349
Thallium	mg/kg	0.012 / 0.039	ND	0.017	0.017	CRM2.5	05/05/2010	1 / 15	0.017
Vanadium	mg/kg	0.078 / 0.26	ND	ND	ND			0 / 15	0
Zinc	mg/kg		10.5	10.5	25.5	CRM2.5	05/05/2010	15 / 15	15.45

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 11. 2009 Tree Swallow Egg Sampling at Fort Loudoun Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	24.69 / 25	ND	ND	ND			0 / 9	0
Antimony	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Arsenic	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Barium	mg/kg		0.2743	0.2743	2.262	FLD.CONTROL05	05/08/2009	9 / 9	1.2
Beryllium	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Boron	mg/kg	1.976 / 2.015	ND	ND	ND			0 / 9	0
Cadmium	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Calcium	mg/kg		400.9	400.9	1991	FLD.CONTROL06	05/08/2009	9 / 9	1103
Chromium	mg/kg	0.0988 / 0.1115	ND	ND	ND			0 / 9	0
Cobalt	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Copper	mg/kg	0.4818 / 0.5032	ND	0.4818	0.8272	FLD.CONTROL07	05/08/2009	4 / 9	0.5944
Iron	mg/kg	24.69 / 24.99	ND	26.89	63.22	FLD.CONTROL05	05/08/2009	6 / 9	42.42
Lead	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Magnesium	mg/kg	98.96 / 99.97	ND	104.4	107.7	FLD.CONTROL05	05/08/2009	2 / 9	106.1
Manganese	mg/kg	0.4818 / 0.4928	ND	0.5256	1.714	FLD.CONTROL25	05/08/2009	7 / 9	1.029
Mercury	mg/kg	0.01936 / 0.0204	ND	ND	ND			0 / 9	0
Molybdenum	mg/kg	0.988 / 1.007	ND	ND	ND			0 / 9	0
Nickel	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Potassium	mg/kg		1164	1164	1612	FLD23	06/01/2009	9 / 9	1354
Selenium	mg/kg		0.2954	0.2954	0.6939	FLD.CONTROL05	05/08/2009	9 / 9	0.4863
Silver	mg/kg	0.04818 / 0.05032	ND	ND	ND			0 / 9	0
Sodium	mg/kg		1279	1279	1697	FLD23	06/01/2009	9 / 9	1501
Strontium	mg/kg		0.422	0.422	1.596	FLD.CONTROL06	05/08/2009	9 / 9	1.091
Thallium	mg/kg	0.0988 / 0.1007	ND	ND	ND			0 / 9	0
Vanadium	mg/kg	0.1936 / 0.204	ND	ND	ND			0 / 9	0
Zinc	mg/kg		6.225	6.225	31.35	FLD.CONTROL05	05/08/2009	9 / 9	18.03

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 12. 2010 Tree Swallow Egg Sampling at Fort Loudoun Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.3 / 8.1	ND	ND	ND			0 / 16	0
Antimony	mg/kg	0.012 / 0.029	ND	ND	ND			0 / 16	0
Arsenic	mg/kg	0.023 / 0.058	ND	ND	ND			0 / 16	0
Barium	mg/kg		0.33	0.33	5.7	FLD	05/08/2010	16 / 16	1.539
Beryllium	mg/kg	0.013 / 0.064	ND	ND	ND			0 / 16	0
Boron	mg/kg	0.34 / 0.84	ND	ND	ND			0 / 16	0
Cadmium	mg/kg	0.0076 / 0.017	ND	0.0087	0.0087	FLD	06/17/2010	1 / 16	0.0087
Calcium	mg/kg		288	288	13000	FLD	06/11/2010	16 / 16	1585
Chromium	mg/kg	0.11 / 0.26	ND	0.15	0.16	FLD	06/11/2010	2 / 16	0.155
Cobalt	mg/kg	0.012 / 0.018	ND	0.014	0.031	FLD	06/15/2010	11 / 16	0.02064
Copper	mg/kg		0.34	0.34	0.66	FLD	05/04/2010	16 / 16	0.4731
Iron	mg/kg	10 / 15.3	ND	12.6	55.3	FLD	06/14/2010	15 / 16	34.11
Lead	mg/kg	0.023 / 0.056	ND	ND	ND			0 / 16	0
Magnesium	mg/kg	40.1 / 49.7	ND	63.8	140	FLD	06/14/2010	15 / 16	95.91
Manganese	mg/kg	0.14 / 1	ND	0.39	2.3	FLD	05/08/2010	11 / 16	1.358
Mercury	mg/kg	0.0096 / 0.033	ND	0.016	0.025	FLD	05/04/2010	10 / 16	0.02
Molybdenum	mg/kg	0.029 / 0.071	ND	ND	ND			0 / 16	0
Nickel	mg/kg	0.081 / 0.38	ND	1.4	1.5	FLD	05/08/2010	2 / 16	1.45
Potassium	mg/kg		1300	1300	1690	FLD	06/15/2010	16 / 16	1479
Selenium	mg/kg		0.24	0.24	0.93	FLD	05/07/2010	16 / 16	0.5281
Silver	mg/kg	0.0024 / 0.01	ND	0.0028	0.0062	FLD	05/08/2010	3 / 16	0.004567
Sodium	mg/kg		1480	1480	1840	FLD	05/06/2010	16 / 16	1661
Strontium	mg/kg		0.34	0.34	7.3	FLD	06/11/2010	16 / 16	1.269
Thallium	mg/kg	0.011 / 0.028	ND	ND	ND			0 / 16	0
Vanadium	mg/kg	0.038 / 0.095	ND	ND	ND			0 / 16	0
Zinc	mg/kg		3.4	3.4	30	FLD	06/15/2010	16 / 16	18.31

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 13. 2009 Tree Swallow Egg Sampling at Melton Hill Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	24.82 / 74.9	ND	ND	ND			0 / 16	0
Antimony	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Arsenic	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Barium	mg/kg		0.3604	0.3604	3.5	MHD02	06/04/2009	16 / 16	1.397
Beryllium	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Boron	mg/kg	1.984 / 6	ND	ND	ND			0 / 16	0
Cadmium	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Calcium	mg/kg		371	371	5762	MHD.CONTROL18	05/08/2009	16 / 16	1488
Chromium	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Cobalt	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Copper	mg/kg	0.4914 / 1.5	ND	0.5673	3.5	MHD24	06/14/2009	7 / 16	1.091
Iron	mg/kg	24.82 / 74.9	ND	25.44	73.2	MHD.CONTROL18	05/08/2009	9 / 16	42.18
Lead	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Magnesium	mg/kg	99.37 / 299	ND	108	141	MHD.CONTROL18	05/08/2009	2 / 16	111
Manganese	mg/kg	0.4914 / 1.5	ND	0.74	2.62	MHD11	06/01/2009	12 / 16	1.31
Mercury	mg/kg	0.0191 / 0.06	ND	0.02865	0.041	MHD17	06/14/2009	2 / 16	0.03483
Molybdenum	mg/kg	0.985 / 3	ND	ND	ND			0 / 16	0
Nickel	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Potassium	mg/kg		1090	1090	1960	MHD03	06/04/2009	16 / 16	1408
Selenium	mg/kg	0.191 / 0.6	ND	0.4186	1.1	MHD24	06/14/2009	15 / 16	0.6896
Silver	mg/kg	0.04914 / 0.15	ND	ND	ND			0 / 16	0
Sodium	mg/kg		1090	1090	2530	MHD03	06/04/2009	16 / 16	1540
Strontium	mg/kg		0.41	0.41	3.67	MHD.CONTROL18	05/08/2009	16 / 16	1.159
Thallium	mg/kg	0.0985 / 0.3	ND	ND	ND			0 / 16	0
Vanadium	mg/kg	0.191 / 0.6	ND	ND	ND			0 / 16	0
Zinc	mg/kg		5.826	5.826	36.5	MHD.CONTROL18	05/08/2009	16 / 16	17.22

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 14. 2010 Tree Swallow Egg Sampling at Melton Hill Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.6 / 9.8	ND	ND	ND			0 / 15	0
Antimony	mg/kg	0.013 / 0.036	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.025 / 0.069	ND	ND	ND			0 / 15	0
Barium	mg/kg		0.36	0.36	6.6	MHD	05/05/2010	15 / 15	2.027
Beryllium	mg/kg	0.029 / 0.15	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.37 / 1	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.0075 / 0.038	ND	ND	ND			0 / 15	0
Calcium	mg/kg		394	394	4840	MHD	05/04/2010	15 / 15	1340
Chromium	mg/kg	0.11 / 0.31	ND	ND	ND			0 / 15	0
Cobalt	mg/kg	0.013 / 0.035	ND	0.018	0.075	MHD	05/04/2010	10 / 15	0.0272
Copper	mg/kg		0.35	0.35	0.61	MHD	05/04/2010	15 / 15	0.47
Iron	mg/kg		14.9	14.9	81.6	MHD	05/04/2010	15 / 15	38.13
Lead	mg/kg	0.025 / 0.068	ND	0.069	0.069	MHD	05/04/2010	1 / 15	0.069
Magnesium	mg/kg		57.3	57.3	215	MHD	05/04/2010	15 / 15	99.35
Manganese	mg/kg	0.16 / 1	ND	0.96	4.8	MHD	05/04/2010	10 / 15	2.156
Mercury	mg/kg	0.01 / 0.034	ND	0.017	0.028	MHD	05/04/2010	10 / 15	0.024
Molybdenum	mg/kg	0.031 / 0.086	ND	ND	ND			0 / 15	0
Nickel	mg/kg	0.087 / 0.24	ND	1.4	1.5	MHD	05/08/2010	2 / 15	1.45
Potassium	mg/kg		1290	1290	1780	MHD	05/05/2010	15 / 15	1497
Selenium	mg/kg		0.48	0.48	1.5	MHD	05/04/2010	15 / 15	0.766
Silver	mg/kg	0.0029 / 0.024	ND	ND	ND			0 / 15	0
Sodium	mg/kg		1410	1410	2150	MHD	05/05/2010	15 / 15	1627
Strontium	mg/kg		0.38	0.38	2.9	MHD	05/04/2010	15 / 15	1.133
Thallium	mg/kg	0.012 / 0.034	ND	ND	ND			0 / 15	0
Vanadium	mg/kg	0.041 / 0.11	ND	ND	ND			0 / 15	0
Zinc	mg/kg		10.4	10.4	54.8	MHD	05/04/2010	15 / 15	21.49

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 15. 2010 Tree Swallow Egg Sampling at North, West, and East Embayments

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.7 / 6.7	ND	ND	ND			0 / 10	0
Antimony	mg/kg	0.013 / 0.024	ND	ND	ND			0 / 10	0
Arsenic	mg/kg	0.027 / 0.058	ND	ND	ND			0 / 10	0
Barium	mg/kg		0.3648	0.3648	2.9	EEMBAY	05/05/2010	10 / 10	1.618
Beryllium	mg/kg	0.027 / 0.1	ND	ND	ND			0 / 10	0
Boron	mg/kg	0.38 / 1.17	ND	ND	ND			0 / 10	0
Cadmium	mg/kg	0.00243 / 0.026	ND	ND	ND			0 / 10	0
Calcium	mg/kg		570	570	4520	NEMBAY	05/06/2010	10 / 10	1472
Chromium	mg/kg	0.12 / 0.21	ND	0.13	0.13	NEMBAY	05/11/2010	1 / 10	0.13
Cobalt	mg/kg	0.013 / 0.024	ND	0.01824	0.036	EEMBAY	05/05/2010	7 / 10	0.02675
Copper	mg/kg		0.39	0.39	0.57	NEMBAY	05/06/2010	10 / 10	0.4686
Iron	mg/kg		20.5	20.5	60.6	NEMBAY	05/11/2010	10 / 10	37.64
Lead	mg/kg	0.026 / 0.083	ND	ND	ND			0 / 10	0
Magnesium	mg/kg		71	71	162	EEMBAY	05/05/2010	10 / 10	101.1
Manganese	mg/kg		0.42	0.42	3.7	EEMBAY	05/05/2010	10 / 10	1.786
Mercury	mg/kg	0.011 / 0.053	ND	0.026	0.04408	EEMBAY	05/05/2010	6 / 10	0.03451
Molybdenum	mg/kg	0.032 / 0.059	ND	0.039	0.04256	EEMBAY	05/05/2010	2 / 10	0.04078
Nickel	mg/kg	0.09 / 0.16	ND	0.81	6.3	NEMBAY	05/06/2010	4 / 10	2.328
Potassium	mg/kg		1370	1370	1690	WEMBAY	05/06/2010	10 / 10	1580
Selenium	mg/kg		0.52	0.52	1.1	NEMBAY	05/11/2010	10 / 10	0.8054
Silver	mg/kg	0.0027 / 0.009	ND	ND	ND			0 / 10	0
Sodium	mg/kg		1540	1540	2070	EEMBAY	05/05/2010	10 / 10	1823
Strontium	mg/kg		0.6384	0.6384	3.7	NEMBAY	05/06/2010	10 / 10	1.427
Thallium	mg/kg	0.013 / 0.038	ND	0.013	0.013	WEMBAY	05/06/2010	1 / 10	0.013
Vanadium	mg/kg	0.043 / 0.093	ND	ND	ND			0 / 10	0
Zinc	mg/kg		11.9	11.9	32.1	EEMBAY	05/05/2010	10 / 10	20.51

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 16. 2010 Tree Swallow Egg Sampling at Clinch River Mile 1.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Antimony	mg/kg	0.014 / 0.028	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.027 / 0.054	ND	ND	ND			0 / 15	0
Barium	mg/kg		0.28	0.28	6.5	CRM1.0	05/10/2010	15 / 15	2.249
Beryllium	mg/kg	0.028 / 0.057	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.4 / 0.8	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.0078 / 0.022	ND	ND	ND			0 / 15	0
Calcium	mg/kg		560	560	3330	CRM1.0	05/10/2010	15 / 15	1186
Chromium	mg/kg	0.12 / 0.24	ND	0.14	0.28	CRM1.0	05/10/2010	8 / 15	0.18
Cobalt	mg/kg	0.014 / 0.027	ND	0.014	0.047	CRM1.0	05/10/2010	11 / 15	0.02455
Copper	mg/kg		0.38	0.38	0.73	CRM1.0	05/10/2010	15 / 15	0.514
Iron	mg/kg	11.6 / 23.1	ND	23	66.5	CRM1.0	05/10/2010	14 / 15	38.09
Lead	mg/kg	0.052 / 0.1	ND	ND	ND			0 / 15	0
Magnesium	mg/kg	46.3 / 92.6	ND	71.9	130	CRM1.0	05/10/2010	14 / 15	97.37
Manganese	mg/kg		0.78	0.78	3.1	CRM1.0	05/10/2010	15 / 15	1.493
Mercury	mg/kg	0.023 / 0.068	ND	ND	ND			0 / 15	0
Molybdenum	mg/kg	0.034 / 0.068	ND	0.051	0.052	CRM1.0	05/10/2010	2 / 15	0.0515
Nickel	mg/kg	0.094 / 0.19	ND	0.38	0.38	CRM1.0	05/10/2010	1 / 15	0.38
Potassium	mg/kg		1310	1310	1900	CRM1.0	05/10/2010	15 / 15	1568
Selenium	mg/kg		0.46	0.46	1.1	CRM1.0	05/10/2010	15 / 15	0.682
Silver	mg/kg	0.0028 / 0.0056	ND	0.0031	0.01	CRM1.0	05/10/2010	2 / 15	0.00655
Sodium	mg/kg		1450	1450	2060	CRM1.0	05/10/2010	15 / 15	1814
Strontium	mg/kg		0.66	0.66	3.1	CRM1.0	05/10/2010	15 / 15	1.23
Thallium	mg/kg	0.013 / 0.026	ND	0.022	0.022	CRM1.0	05/10/2010	1 / 15	0.022
Vanadium	mg/kg	0.044 / 0.088	ND	ND	ND			0 / 15	0
Zinc	mg/kg		12.6	12.6	36	CRM1.0	05/10/2010	15 / 15	21.99

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 17. 2010 Tree Swallow Egg Sampling at Tennessee River Mile 566.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.8 / 8.5	ND	ND	ND			0 / 9	0
Antimony	mg/kg	0.014 / 0.031	ND	ND	ND			0 / 9	0
Arsenic	mg/kg	0.029 / 0.06	ND	ND	ND			0 / 9	0
Barium	mg/kg		0.84	0.84	4.5	TRM566.0	05/04/2010	9 / 9	2.94
Beryllium	mg/kg	0.03 / 0.13	ND	0.03	0.03	TRM566.0	05/11/2010	1 / 9	0.03
Boron	mg/kg	0.39 / 0.88	ND	ND	ND			0 / 9	0
Cadmium	mg/kg	0.0079 / 0.033	ND	ND	ND			0 / 9	0
Calcium	mg/kg		692	692	1630	TRM566.0	05/04/2010	9 / 9	1085
Chromium	mg/kg	0.12 / 0.27	ND	0.13	0.13	TRM566.0	05/11/2010	1 / 9	0.13
Cobalt	mg/kg	0.013 / 0.03	ND	0.013	0.054	TRM566.0	05/11/2010	7 / 9	0.02943
Copper	mg/kg		0.35	0.35	0.52	TRM566.0	05/11/2010	9 / 9	0.4478
Iron	mg/kg		29.7	29.7	121	TRM566.0	05/04/2010	9 / 9	55.72
Lead	mg/kg	0.029 / 0.083	ND	ND	ND			0 / 9	0
Magnesium	mg/kg		84.9	84.9	185	TRM566.0	05/04/2010	9 / 9	116.6
Manganese	mg/kg		1.1	1.1	8.2	TRM566.0	05/04/2010	9 / 9	2.589
Mercury	mg/kg	0.011 / 0.025	ND	0.017	0.027	TRM566.0	05/11/2010	8 / 9	0.022
Molybdenum	mg/kg	0.033 / 0.075	ND	0.041	0.049	TRM566.0	05/04/2010	2 / 9	0.045
Nickel	mg/kg	0.092 / 0.21	ND	ND	ND			0 / 9	0
Potassium	mg/kg		1320	1320	1810	TRM566.0	05/11/2010	9 / 9	1467
Selenium	mg/kg		0.53	0.53	1.1	TRM566.0	05/04/2010	9 / 9	0.8033
Silver	mg/kg	0.0027 / 0.0062	ND	ND	ND			0 / 9	0
Sodium	mg/kg		1450	1450	1850	TRM566.0	05/11/2010	9 / 9	1647
Strontium	mg/kg		0.69	0.69	2	TRM566.0	05/04/2010	9 / 9	1.198
Thallium	mg/kg	0.013 / 0.029	ND	ND	ND			0 / 9	0
Vanadium	mg/kg	0.047 / 0.098	ND	ND	ND			0 / 9	0
Zinc	mg/kg		21.8	21.8	48.3	TRM566.0	05/04/2010	9 / 9	28.61

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 18. 2010 Tree Swallow Egg Sampling at Tennessee River Miles 569.5 and 571.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.8 / 9	ND	ND	ND			0 / 15	0
Antimony	mg/kg	0.014 / 0.033	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.027 / 0.063	ND	ND	ND			0 / 15	0
Barium	mg/kg		0.61	0.61	7.4	TRM569.5	05/19/2010	15 / 15	2.166
Beryllium	mg/kg	0.056 / 0.13	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.39 / 0.93	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.0072 / 0.035	ND	ND	ND			0 / 15	0
Calcium	mg/kg		548	548	12500	TRM571.5	05/19/2010	15 / 15	2261
Chromium	mg/kg	0.12 / 0.29	ND	ND	ND			0 / 15	0
Cobalt	mg/kg	0.013 / 0.032	ND	0.014	0.039	TRM571.5	05/19/2010	12 / 15	0.02158
Copper	mg/kg	0.14 / 1.9	ND	0.34	3	TRM571.5	05/19/2010	14 / 15	0.7071
Iron	mg/kg	11.4 / 27.2	ND	16.6	67.4	TRM571.5	05/19/2010	14 / 15	39.65
Lead	mg/kg	0.027 / 0.36	ND	0.11	0.11	TRM569.5	05/13/2010	1 / 15	0.11
Magnesium	mg/kg		60.9	60.9	152	TRM571.5	05/19/2010	15 / 15	97.77
Manganese	mg/kg		0.51	0.51	2.8	TRM571.5	05/19/2010	15 / 15	1.321
Mercury	mg/kg		0.017	0.017	0.049	TRM571.5	05/19/2010	15 / 15	0.02447
Molybdenum	mg/kg	0.033 / 0.079	ND	ND	ND			0 / 15	0
Nickel	mg/kg	0.093 / 0.22	ND	ND	ND			0 / 15	0
Potassium	mg/kg		1260	1260	3210	TRM571.5	05/19/2010	15 / 15	1497
Selenium	mg/kg		0.39	0.39	0.92	TRM571.5	05/19/2010	15 / 15	0.548
Silver	mg/kg	0.0028 / 0.038	ND	0.0037	0.0037	TRM571.5	05/19/2010	1 / 15	0.0037
Sodium	mg/kg		1220	1220	3530	TRM571.5	05/19/2010	15 / 15	1643
Strontium	mg/kg		0.57	0.57	5.7	TRM571.5	05/04/2010	15 / 15	1.562
Thallium	mg/kg	0.013 / 0.031	ND	ND	ND			0 / 15	0
Vanadium	mg/kg	0.044 / 0.59	ND	ND	ND			0 / 15	0
Zinc	mg/kg		10.9	10.9	49	TRM571.5	05/19/2010	15 / 15	22.89

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 19. 2010 Tree Swallow Egg Sampling at Tellico Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.5 / 8.3	ND	ND	ND			0 / 15	0
Antimony	mg/kg	0.013 / 0.03	ND	0.037	0.037	TLD	05/07/2010	1 / 15	0.037
Arsenic	mg/kg	0.02584 / 0.064	ND	ND	ND			0 / 15	0
Barium	mg/kg		0.4088	0.4088	4.7	TLD	05/07/2010	15 / 15	1.375
Beryllium	mg/kg	0.026 / 0.12	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.36 / 0.86	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.0069 / 0.032	ND	ND	ND			0 / 15	0
Calcium	mg/kg		502.2	502.2	15000	TLD	05/07/2010	15 / 15	1858
Chromium	mg/kg	0.11 / 0.26	ND	ND	ND			0 / 15	0
Cobalt	mg/kg	0.012 / 0.029	ND	0.017	0.043	TLD	05/04/2010	10 / 15	0.02363
Copper	mg/kg		0.38	0.38	0.72	TLD	05/04/2010	15 / 15	0.5273
Iron	mg/kg	10.6 / 23.3	ND	20.37	52	TLD	05/04/2010	14 / 15	37.3
Lead	mg/kg	0.024 / 0.058	ND	ND	ND			0 / 15	0
Magnesium	mg/kg		68.62	68.62	144.2	TLD	05/04/2010	15 / 15	103.7
Manganese	mg/kg		0.5694	0.5694	2.6	TLD	05/04/2010	15 / 15	1.397
Mercury	mg/kg	0.01064 / 0.061	ND	0.021	0.0356	TLD	05/04/2010	9 / 15	0.02954
Molybdenum	mg/kg	0.031 / 0.073	ND	0.032	0.049	TLD	05/04/2010	4 / 15	0.0394
Nickel	mg/kg	0.086 / 0.2	ND	ND	ND			0 / 15	0
Potassium	mg/kg		1270	1270	2360	TLD	05/04/2010	15 / 15	1634
Selenium	mg/kg		0.4088	0.4088	1.1	TLD	05/04/2010	15 / 15	0.6044
Silver	mg/kg	0.00258 / 0.006	ND	ND	ND			0 / 15	0
Sodium	mg/kg		1577	1577	2577	TLD	05/04/2010	15 / 15	1831
Strontium	mg/kg		0.37	0.37	8.8	TLD	05/07/2010	15 / 15	1.436
Thallium	mg/kg	0.012 / 0.028	ND	ND	ND			0 / 15	0
Vanadium	mg/kg	0.04256 / 0.104	ND	ND	ND			0 / 15	0
Zinc	mg/kg		11.1	11.1	36.67	TLD	05/04/2010	15 / 15	20.07

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 20. 2010 Tree Swallow Egg Sampling at Lower Emory River Mile 2.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detection s
Aluminum	mg/kg	4.2 / 12.4	ND	ND	ND			0 / 2	0
Antimony	mg/kg	0.015 / 0.045	ND	ND	ND			0 / 2	0
Arsenic	mg/kg	0.058 / 0.17	ND	ND	ND			0 / 2	0
Barium	mg/kg		2.2	2.2	5.5	LERM2.0	05/17/2010	2 / 2	3.85
Beryllium	mg/kg	0.06 / 0.091	ND	ND	ND			0 / 2	0
Boron	mg/kg	0.43 / 1.3	ND	ND	ND			0 / 2	0
Cadmium	mg/kg	0.015 / 0.024	ND	ND	ND			0 / 2	0
Calcium	mg/kg		1000	1000	1810	LERM2.0	05/17/2010	2 / 2	1405
Chromium	mg/kg	0.13 / 0.39	ND	0.35	0.35	LERM2.0	05/11/2010	1 / 2	0.35
Cobalt	mg/kg		0.028	0.028	0.043	LERM2.0	05/17/2010	2 / 2	0.0355
Copper	mg/kg		0.47	0.47	0.48	LERM2.0	05/17/2010	2 / 2	0.475
Iron	mg/kg		40	40	108	LERM2.0	05/17/2010	2 / 2	74
Lead	mg/kg	0.084 / 0.086	ND	ND	ND			0 / 2	0
Magnesium	mg/kg		105	105	154	LERM2.0	05/17/2010	2 / 2	129.5
Manganese	mg/kg		2.2	2.2	3	LERM2.0	05/17/2010	2 / 2	2.6
Mercury	mg/kg	0.012 / 0.036	ND	0.027	0.027	LERM2.0	05/11/2010	1 / 2	0.027
Molybdenum	mg/kg	0.036 / 0.11	ND	ND	ND			0 / 2	0
Nickel	mg/kg	0.1 / 0.3	ND	0.12	0.12	LERM2.0	05/11/2010	1 / 2	0.12
Potassium	mg/kg		1500	1500	1520	LERM2.0	05/11/2010	2 / 2	1510
Selenium	mg/kg		0.73	0.73	1.3	LERM2.0	05/17/2010	2 / 2	1.015
Silver	mg/kg	0.003 / 0.0089	ND	ND	ND			0 / 2	0
Sodium	mg/kg		1360	1360	1560	LERM2.0	05/11/2010	2 / 2	1460
Strontium	mg/kg		1.5	1.5	3	LERM2.0	05/17/2010	2 / 2	2.25
Thallium	mg/kg	0.014 / 0.043	ND	ND	ND			0 / 2	0
Vanadium	mg/kg	0.094 / 0.28	ND	ND	ND			0 / 2	0
Zinc	mg/kg		23	23	52.2	LERM2.0	05/17/2010	2 / 2	37.6

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 21. 2010 Tree Swallow Dud Egg Sampling at Emory River Miles 3.0 and 3.5 and Clinch River Mile 2.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.9 / 5.4	ND	ND	ND			0 / 4	0
Antimony	mg/kg	0.014 / 0.019	ND	ND	ND			0 / 4	0
Arsenic	mg/kg	0.027 / 0.029	ND	0.064	0.064	CRM2.5	06/07/2010	1 / 4	0.064
Barium	mg/kg		0.77	0.77	6.6	CRM2.5	06/07/2010	4 / 4	2.543
Beryllium	mg/kg	0.058 / 0.08	ND	ND	ND			0 / 4	0
Boron	mg/kg	0.4 / 0.42	ND	0.87	0.87	CRM2.5	06/07/2010	1 / 4	0.87
Cadmium	mg/kg	0.0074 / 0.01	ND	ND	ND			0 / 4	0
Calcium	mg/kg		683	683	46000	CRM2.5	06/07/2010	4 / 4	13258
Chromium	mg/kg	0.12 / 0.17	ND	0.22	0.22	ERM3.0	06/08/2010	1 / 4	0.22
Cobalt	mg/kg	0.014 / 0.014	ND	0.015	0.053	CRM2.5	06/07/2010	3 / 4	0.03067
Copper	mg/kg		0.51	0.51	1.9	CRM2.5	06/07/2010	4 / 4	1.063
Iron	mg/kg		15.8	15.8	74.3	CRM2.5	06/07/2010	4 / 4	35.38
Lead	mg/kg	0.027 / 0.037	ND	ND	ND			0 / 4	0
Magnesium	mg/kg		59.8	59.8	428	CRM2.5	06/07/2010	4 / 4	172.7
Manganese	mg/kg		0.35	0.35	7.6	CRM2.5	06/07/2010	4 / 4	2.515
Mercury	mg/kg		0.031	0.031	0.11	CRM2.5	06/07/2010	4 / 4	0.056
Molybdenum	mg/kg	0.034 / 0.047	ND	ND	ND			0 / 4	0
Nickel	mg/kg	0.095 / 0.13	ND	ND	ND			0 / 4	0
Potassium	mg/kg		1330	1330	4870	CRM2.5	06/07/2010	4 / 4	2375
Selenium	mg/kg		0.53	0.53	2.1	CRM2.5	06/07/2010	4 / 4	0.9875
Silver	mg/kg	0.0028 / 0.0039	ND	ND	ND			0 / 4	0
Sodium	mg/kg		1700	1700	5930	CRM2.5	06/07/2010	4 / 4	2828
Strontium	mg/kg		0.75	0.75	33.4	CRM2.5	06/07/2010	4 / 4	9.763
Thallium	mg/kg	0.013 / 0.039	ND	ND	ND			0 / 4	0
Vanadium	mg/kg	0.044 / 0.061	ND	ND	ND			0 / 4	0
Zinc	mg/kg		9.2	9.2	38.2	CRM2.5	06/07/2010	4 / 4	18.08

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 22. 2010 Tree Swallow Dud Egg Sampling at Fort Loudoun Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	12.1 / 12.1	ND	ND	ND			0 / 1	0
Antimony	mg/kg	0.044 / 0.044	ND	ND	ND			0 / 1	0
Arsenic	mg/kg	0.085 / 0.085	ND	ND	ND			0 / 1	0
Barium	mg/kg		0.44	0.44	0.44	FLD	06/08/2010	1 / 1	0.44
Beryllium	mg/kg	0.18 / 0.18	ND	ND	ND			0 / 1	0
Boron	mg/kg	1.2 / 1.2	ND	ND	ND			0 / 1	0
Cadmium	mg/kg	0.023 / 0.023	ND	ND	ND			0 / 1	0
Calcium	mg/kg		1100	1100	1100	FLD	06/08/2010	1 / 1	1100
Chromium	mg/kg	0.38 / 0.38	ND	ND	ND			0 / 1	0
Cobalt	mg/kg	0.042 / 0.042	ND	ND	ND			0 / 1	0
Copper	mg/kg		0.66	0.66	0.66	FLD	06/08/2010	1 / 1	0.66
Iron	mg/kg	36.3 / 36.3	ND	ND	ND			0 / 1	0
Lead	mg/kg	0.084 / 0.084	ND	ND	ND			0 / 1	0
Magnesium	mg/kg	145 / 145	ND	ND	ND			0 / 1	0
Manganese	mg/kg		0.74	0.74	0.74	FLD	06/08/2010	1 / 1	0.74
Mercury	mg/kg		0.047	0.047	0.047	FLD	06/08/2010	1 / 1	0.047
Molybdenum	mg/kg	0.11 / 0.11	ND	ND	ND			0 / 1	0
Nickel	mg/kg	0.29 / 0.29	ND	ND	ND			0 / 1	0
Potassium	mg/kg	2180 / 2180	ND	ND	ND			0 / 1	0
Selenium	mg/kg		0.59	0.59	0.59	FLD	06/08/2010	1 / 1	0.59
Silver	mg/kg	0.0087 / 0.0087	ND	ND	ND			0 / 1	0
Sodium	mg/kg		1880	1880	1880	FLD	06/08/2010	1 / 1	1880
Strontium	mg/kg		0.78	0.78	0.78	FLD	06/08/2010	1 / 1	0.78
Thallium	mg/kg	0.042 / 0.042	ND	ND	ND			0 / 1	0
Vanadium	mg/kg	0.14 / 0.14	ND	ND	ND			0 / 1	0
Zinc	mg/kg		14.3	14.3	14.3	FLD	06/08/2010	1 / 1	14.3

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 23. 2010 Tree Swallow Dud Egg Sampling at Melton Hill Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	4 / 6.5	ND	ND	ND			0 / 4	0
Antimony	mg/kg	0.014 / 0.024	ND	ND	ND			0 / 4	0
Arsenic	mg/kg	0.028 / 0.046	ND	ND	ND			0 / 4	0
Barium	mg/kg		0.23	0.23	1.8	MHD	06/08/2010	4 / 4	0.935
Beryllium	mg/kg	0.059 / 0.097	ND	ND	ND			0 / 4	0
Boron	mg/kg	0.41 / 0.68	ND	ND	ND			0 / 4	0
Cadmium	mg/kg	0.0075 / 0.012	ND	ND	ND			0 / 4	0
Calcium	mg/kg		412	412	3970	MHD	06/08/2010	4 / 4	1523
Chromium	mg/kg	0.13 / 0.21	ND	0.14	0.14	MHD	06/14/2010	1 / 4	0.14
Cobalt	mg/kg		0.017	0.017	0.042	MHD	06/08/2010	4 / 4	0.0275
Copper	mg/kg		0.52	0.52	1.3	MHD	06/08/2010	4 / 4	0.825
Iron	mg/kg		13.1	13.1	64.9	MHD	06/08/2010	4 / 4	31.83
Lead	mg/kg	0.028 / 0.045	ND	ND	ND			0 / 4	0
Magnesium	mg/kg	47.6 / 48.2	ND	72	197	MHD	06/08/2010	3 / 4	118.1
Manganese	mg/kg		0.22	0.22	3.2	MHD	06/08/2010	4 / 4	1.448
Mercury	mg/kg		0.013	0.013	0.072	MHD	06/08/2010	4 / 4	0.03975
Molybdenum	mg/kg	0.035 / 0.057	ND	ND	ND			0 / 4	0
Nickel	mg/kg	0.096 / 0.16	ND	ND	ND			0 / 4	0
Potassium	mg/kg		1400	1400	2750	MHD	06/08/2010	4 / 4	1863
Selenium	mg/kg		0.53	0.53	1.5	MHD	06/08/2010	4 / 4	0.89
Silver	mg/kg	0.0029 / 0.0047	ND	ND	ND			0 / 4	0
Sodium	mg/kg		1690	1690	3630	MHD	06/08/2010	4 / 4	2275
Strontium	mg/kg		0.28	0.28	3	MHD	06/08/2010	4 / 4	1.185
Thallium	mg/kg	0.014 / 0.022	ND	ND	ND			0 / 4	0
Vanadium	mg/kg	0.045 / 0.075	ND	ND	ND			0 / 4	0
Zinc	mg/kg		4.6	4.6	24.1	MHD	06/08/2010	4 / 4	13.1

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 24. 2010 Tree Swallow Egg Shell Sampling at Emory River Mile 3.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	6.1 / 13.2	ND	ND	ND			0 / 7	0
Antimony	mg/kg	0.022 / 0.048	ND	ND	ND			0 / 7	0
Arsenic	mg/kg	0.043 / 0.15	ND	0.055	0.093	ERM3.0	05/05/2010	5 / 7	0.0718
Barium	mg/kg		5.1	5.1	22	ERM3.0	05/05/2010	7 / 7	13.14
Beryllium	mg/kg	0.091 / 0.2	ND	ND	ND			0 / 7	0
Boron	mg/kg	0.63 / 1.4	ND	ND	ND			0 / 7	0
Cadmium	mg/kg	0.024 / 0.051	ND	ND	ND			0 / 7	0
Calcium	mg/kg		98400	98400	191000	ERM3.0	05/05/2010	7 / 7	127629
Chromium	mg/kg	0.19 / 0.42	ND	ND	ND			0 / 7	0
Cobalt	mg/kg	0.022 / 0.046	ND	ND	ND			0 / 7	0
Copper	mg/kg		0.8	0.8	1.2	ERM3.0	05/12/2010	7 / 7	0.9329
Iron	mg/kg	18.4 / 39.8	ND	ND	ND			0 / 7	0
Lead	mg/kg	0.043 / 0.092	ND	ND	ND			0 / 7	0
Magnesium	mg/kg		353	353	691	ERM3.0	05/05/2010	7 / 7	481.1
Manganese	mg/kg		0.28	0.28	1.4	ERM3.0	05/05/2010	7 / 7	0.6971
Mercury	mg/kg	0.018 / 0.038	ND	0.027	0.04	ERM3.0	05/12/2010	5 / 7	0.0312
Molybdenum	mg/kg	0.054 / 0.12	ND	ND	ND			0 / 7	0
Nickel	mg/kg	0.15 / 0.32	ND	ND	ND			0 / 7	0
Potassium	mg/kg	1110 / 2390	ND	1300	1360	ERM3.0	05/05/2010	2 / 7	1330
Selenium	mg/kg		0.28	0.28	0.58	ERM3.0	05/12/2010	7 / 7	0.3729
Silver	mg/kg	0.0044 / 0.0096	ND	ND	ND			0 / 7	0
Sodium	mg/kg		1210	1210	1550	ERM3.0	05/05/2010	7 / 7	1417
Strontium	mg/kg		60.3	60.3	143	ERM3.0	05/05/2010	7 / 7	98.83
Thallium	mg/kg	0.026 / 0.058	ND	ND	ND			0 / 7	0
Vanadium	mg/kg	0.14 / 0.3	ND	ND	ND			0 / 7	0
Zinc	mg/kg	3.3 / 7.2	ND	ND	ND			0 / 7	0

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 25. 2010 Tree Swallow Egg Shell Sampling at the North, West, and East Embayments

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	11.3 / 18.4	ND	ND	ND			0 / 4	0
Antimony	mg/kg	0.041 / 0.066	ND	ND	ND			0 / 4	0
Arsenic	mg/kg	0.079 / 0.26	ND	0.093	0.1	WEMBAY	05/06/2010	2 / 4	0.0965
Barium	mg/kg		8.8	8.8	37.4	WEMBAY	05/06/2010	4 / 4	21.28
Beryllium	mg/kg	0.17 / 0.27	ND	ND	ND			0 / 4	0
Boron	mg/kg	1.2 / 1.9	ND	ND	ND			0 / 4	0
Cadmium	mg/kg	0.043 / 0.071	ND	ND	ND			0 / 4	0
Calcium	mg/kg		147000	147000	202000	WEMBAY	05/06/2010	4 / 4	170500
Chromium	mg/kg	0.36 / 0.58	ND	ND	ND			0 / 4	0
Cobalt	mg/kg	0.04 / 0.065	ND	ND	ND			0 / 4	0
Copper	mg/kg		0.73	0.73	1.4	NEMBAY	05/11/2010	4 / 4	1.018
Iron	mg/kg	34 / 55.3	ND	ND	ND			0 / 4	0
Lead	mg/kg	0.079 / 0.13	ND	ND	ND			0 / 4	0
Magnesium	mg/kg		567	567	802	NEMBAY	05/11/2010	4 / 4	658.8
Manganese	mg/kg	0.48 / 0.78	ND	0.86	1.6	EEMBAY	05/05/2010	3 / 4	1.187
Mercury	mg/kg	0.033 / 0.053	ND	ND	ND			0 / 4	0
Molybdenum	mg/kg	0.099 / 0.16	ND	ND	ND			0 / 4	0
Nickel	mg/kg	0.28 / 0.45	ND	ND	ND			0 / 4	0
Potassium	mg/kg	2040 / 3320	ND	ND	ND			0 / 4	0
Selenium	mg/kg		0.31	0.31	0.44	EEMBAY	05/05/2010	4 / 4	0.3675
Silver	mg/kg	0.0082 / 0.013	ND	ND	ND			0 / 4	0
Sodium	mg/kg		1400	1400	1650	NEMBAY	05/11/2010	4 / 4	1470
Strontium	mg/kg		84.5	84.5	171	WEMBAY	05/06/2010	4 / 4	119.4
Thallium	mg/kg	0.044 / 0.14	ND	ND	ND			0 / 4	0
Vanadium	mg/kg	0.26 / 0.42	ND	ND	ND			0 / 4	0
Zinc	mg/kg	6.1 / 10	ND	ND	ND			0 / 4	0

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 26. 2010 Tree Swallow Egg Sampling at Downstream Tennessee River

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	10.3 / 14.4	ND	ND	ND			0 / 2	0
Antimony	mg/kg	0.037 / 0.052	ND	ND	ND			0 / 2	0
Arsenic	mg/kg	0.1 / 0.14	ND	0.1	0.1	TRM566.0	05/11/2010	1 / 2	0.1
Barium	mg/kg		40	40	97.2	TRM566.0	05/11/2010	2 / 2	68.6
Beryllium	mg/kg	0.15 / 0.22	ND	ND	ND			0 / 2	0
Boron	mg/kg	1.1 / 1.5	ND	ND	ND			0 / 2	0
Cadmium	mg/kg	0.04 / 0.056	ND	ND	ND			0 / 2	0
Calcium	mg/kg		161000	161000	169000	TRM566.0	05/11/2010	2 / 2	165000
Chromium	mg/kg	0.33 / 0.46	ND	ND	ND			0 / 2	0
Cobalt	mg/kg	0.036 / 0.051	ND	ND	ND			0 / 2	0
Copper	mg/kg		1.1	1.1	1.3	TRM566.0	05/11/2010	2 / 2	1.2
Iron	mg/kg	30.9 / 43.4	ND	ND	ND			0 / 2	0
Lead	mg/kg	0.072 / 0.1	ND	ND	ND			0 / 2	0
Magnesium	mg/kg		634	634	648	TRM566.0	05/11/2010	2 / 2	641
Manganese	mg/kg		1.2	1.2	2.2	TRM566.0	05/11/2010	2 / 2	1.7
Mercury	mg/kg	0.03 / 0.042	ND	ND	ND			0 / 2	0
Molybdenum	mg/kg	0.09 / 0.13	ND	ND	ND			0 / 2	0
Nickel	mg/kg	0.25 / 0.35	ND	ND	ND			0 / 2	0
Potassium	mg/kg	1860 / 2600	ND	ND	ND			0 / 2	0
Selenium	mg/kg		0.26	0.26	0.4	TRM566.0	05/11/2010	2 / 2	0.33
Silver	mg/kg	0.0074 / 0.01	ND	ND	ND			0 / 2	0
Sodium	mg/kg		1270	1270	1540	TRM566.0	05/11/2010	2 / 2	1405
Strontium	mg/kg		120	120	123	TRM566.0	05/11/2010	2 / 2	121.5
Thallium	mg/kg	0.035 / 0.05	ND	ND	ND			0 / 2	0
Vanadium	mg/kg	0.23 / 0.33	ND	ND	ND			0 / 2	0
Zinc	mg/kg	5.6 / 5.6	ND	10	10	TRM566.0	05/11/2010	1 / 2	10

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 27. 2010 Tree Swallow Egg Shell Sampling at Tellico Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	11.9 / 16.7	ND	ND	ND			0 / 2	0
Antimony	mg/kg	0.043 / 0.06	ND	ND	ND			0 / 2	0
Arsenic	mg/kg	0.17 / 0.23	ND	ND	ND			0 / 2	0
Barium	mg/kg		9.9	9.9	16.2	TLD	05/04/2010	2 / 2	13.05
Beryllium	mg/kg	0.18 / 0.25	ND	ND	ND			0 / 2	0
Boron	mg/kg	1.2 / 1.7	ND	ND	ND			0 / 2	0
Cadmium	mg/kg	0.046 / 0.065	ND	ND	ND			0 / 2	0
Calcium	mg/kg		156000	156000	181000	TLD	05/04/2010	2 / 2	168500
Chromium	mg/kg	0.38 / 0.53	ND	0.77	0.77	TLD	05/04/2010	1 / 2	0.77
Cobalt	mg/kg	0.042 / 0.059	ND	ND	ND			0 / 2	0
Copper	mg/kg		1.1	1.1	2.1	TLD	05/04/2010	2 / 2	1.6
Iron	mg/kg	35.7 / 50.4	ND	ND	ND			0 / 2	0
Lead	mg/kg	0.083 / 0.12	ND	ND	ND			0 / 2	0
Magnesium	mg/kg		667	667	720	TLD	05/04/2010	2 / 2	693.5
Manganese	mg/kg		1.1	1.1	1.8	TLD	05/04/2010	2 / 2	1.45
Mercury	mg/kg	0.034 / 0.048	ND	ND	ND			0 / 2	0
Molybdenum	mg/kg	0.1 / 0.15	ND	ND	ND			0 / 2	0
Nickel	mg/kg	0.29 / 0.41	ND	0.38	0.38	TLD	05/04/2010	1 / 2	0.38
Potassium	mg/kg	2140 / 3020	ND	ND	ND			0 / 2	0
Selenium	mg/kg		0.38	0.38	0.39	TLD	05/04/2010	2 / 2	0.385
Silver	mg/kg	0.0086 / 0.012	ND	ND	ND			0 / 2	0
Sodium	mg/kg		1390	1390	2060	TLD	05/04/2010	2 / 2	1725
Strontium	mg/kg		78.2	78.2	83.6	TLD	05/04/2010	2 / 2	80.9
Thallium	mg/kg	0.041 / 0.058	ND	ND	ND			0 / 2	0
Vanadium	mg/kg	0.27 / 0.38	ND	ND	ND			0 / 2	0
Zinc	mg/kg	6.4 / 9.1	ND	8.4	8.4	TLD	05/04/2010	1 / 2	8.4

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 28. 2010 Tree Swallow Egg Shell Sampling at Fort Loudoun Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	7.9 / 16	ND	ND	ND			0 / 2	0
Antimony	mg/kg	0.029 / 0.058	ND	ND	ND			0 / 2	0
Arsenic	mg/kg	0.055 / 0.22	ND	0.067	0.067	FLD	05/04/2010	1 / 2	0.067
Barium	mg/kg		8.6	8.6	10.9	FLD	05/04/2010	2 / 2	9.75
Beryllium	mg/kg	0.12 / 0.24	ND	ND	ND			0 / 2	0
Boron	mg/kg	0.82 / 1.7	ND	ND	ND			0 / 2	0
Cadmium	mg/kg	0.03 / 0.062	ND	ND	ND			0 / 2	0
Calcium	mg/kg		92600	92600	126000	FLD	05/04/2010	2 / 2	109300
Chromium	mg/kg	0.25 / 0.51	ND	ND	ND			0 / 2	0
Cobalt	mg/kg	0.028 / 0.056	ND	ND	ND			0 / 2	0
Copper	mg/kg		0.72	0.72	0.95	FLD	05/11/2010	2 / 2	0.835
Iron	mg/kg	23.8 / 48.1	ND	32.1	32.1	FLD	05/04/2010	1 / 2	32.1
Lead	mg/kg	0.055 / 0.11	ND	ND	ND			0 / 2	0
Magnesium	mg/kg		417	417	496	FLD	05/04/2010	2 / 2	456.5
Manganese	mg/kg		0.8	0.8	1.9	FLD	05/11/2010	2 / 2	1.35
Mercury	mg/kg	0.023 / 0.046	ND	ND	ND			0 / 2	0
Molybdenum	mg/kg	0.069 / 0.14	ND	ND	ND			0 / 2	0
Nickel	mg/kg	0.19 / 0.39	ND	ND	ND			0 / 2	0
Potassium	mg/kg	1430 / 2880	ND	ND	ND			0 / 2	0
Selenium	mg/kg		0.6	0.6	0.61	FLD	05/04/2010	2 / 2	0.605
Silver	mg/kg	0.0057 / 0.012	ND	ND	ND			0 / 2	0
Sodium	mg/kg		1330	1330	1370	FLD	05/04/2010	2 / 2	1350
Strontium	mg/kg		57	57	81.6	FLD	05/04/2010	2 / 2	69.3
Thallium	mg/kg	0.027 / 0.055	ND	ND	ND			0 / 2	0
Vanadium	mg/kg	0.18 / 0.36	ND	ND	ND			0 / 2	0
Zinc	mg/kg		16.4	16.4	17.7	FLD	05/11/2010	2 / 2	17.05

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 29. 2010 Tree Swallow Egg Shell Sampling at Melton Hill Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	7.6 / 10.3	ND	ND	ND			0 / 3	0
Antimony	mg/kg	0.027 / 0.037	ND	ND	ND			0 / 3	0
Arsenic	mg/kg	0.062 / 0.11	ND	0.081	0.084	MHD	05/04/2010	2 / 3	0.0825
Barium	mg/kg		8.5	8.5	31.2	MHD	05/04/2010	3 / 3	19.9
Beryllium	mg/kg	0.11 / 0.15	ND	ND	ND			0 / 3	0
Boron	mg/kg	0.79 / 1.1	ND	ND	ND			0 / 3	0
Cadmium	mg/kg	0.029 / 0.04	ND	ND	ND			0 / 3	0
Calcium	mg/kg		101000	101000	145000	MHD	05/04/2010	3 / 3	129000
Chromium	mg/kg	0.24 / 0.33	ND	ND	ND			0 / 3	0
Cobalt	mg/kg	0.027 / 0.036	ND	ND	ND			0 / 3	0
Copper	mg/kg		0.69	0.69	1.2	MHD	05/04/2010	3 / 3	0.9567
Iron	mg/kg	22.9 / 30.9	ND	ND	ND			0 / 3	0
Lead	mg/kg	0.053 / 0.072	ND	ND	ND			0 / 3	0
Magnesium	mg/kg		412	412	532	MHD	05/04/2010	3 / 3	491.7
Manganese	mg/kg		0.47	0.47	1.9	MHD	05/04/2010	3 / 3	1.01
Mercury	mg/kg	0.022 / 0.03	ND	0.025	0.025	MHD	05/04/2010	1 / 3	0.025
Molybdenum	mg/kg	0.067 / 0.09	ND	ND	ND			0 / 3	0
Nickel	mg/kg	0.19 / 0.25	ND	ND	ND			0 / 3	0
Potassium	mg/kg	1370 / 1860	ND	1380	1380	MHD	05/04/2010	1 / 3	1380
Selenium	mg/kg		0.33	0.33	0.58	MHD	05/04/2010	3 / 3	0.42
Silver	mg/kg	0.0055 / 0.0074	ND	ND	ND			0 / 3	0
Sodium	mg/kg		1260	1260	1520	MHD	05/04/2010	3 / 3	1423
Strontium	mg/kg		51.3	51.3	78	MHD	05/04/2010	3 / 3	63
Thallium	mg/kg	0.03 / 0.051	ND	ND	ND			0 / 3	0
Vanadium	mg/kg	0.17 / 0.23	ND	ND	ND			0 / 3	0
Zinc	mg/kg	4.1 / 5.6	ND	9.9	9.9	MHD	05/04/2010	1 / 3	9.9

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 30. 2009 Tree Swallow Nestling Sampling at Emory River Mile 3.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		65.30	65.30	74.20	RESIDENTIAL10	05/28/2009	9 / 9	69.56
Aluminum	mg/kg	24.5 / 25.28	ND	ND	ND			0 / 11	0
Antimony	mg/kg	0.09648 / 0.1011	ND	ND	ND			0 / 11	0
Arsenic	mg/kg	0.09648 / 0.1011	ND	0.2015	0.2015	RESIDENTIAL04	06/14/2009	1 / 11	0.2015
Barium	mg/kg		0.7236	0.7236	18.32	RESIDENTIAL07	06/01/2009	11 / 11	4.383
Beryllium	mg/kg	0.09648 / 0.1011	ND	ND	ND			0 / 11	0
Boron	mg/kg	1.934 / 2.029	ND	ND	ND			0 / 11	0
Cadmium	mg/kg	0.09648 / 0.1011	ND	ND	ND			0 / 11	0
Calcium	mg/kg		2002	2002	34094	RESIDENTIAL04	06/14/2009	11 / 11	8347
Chromium	mg/kg	0.09648 / 0.1728	ND	0.1209	0.1209	RESIDENTIAL04	06/14/2009	1 / 11	0.1209
Cobalt	mg/kg	0.09648 / 0.1011	ND	ND	ND			0 / 11	0
Copper	mg/kg		1.463	1.463	7.335	RESIDENTIAL04	06/14/2009	11 / 11	2.811
Iron	mg/kg		45.22	45.22	234.5	RESIDENTIAL04	06/14/2009	11 / 11	76.18
Lead	mg/kg	0.09648 / 0.1011	ND	0.09672	0.09672	RESIDENTIAL04	06/14/2009	1 / 11	0.09672
Magnesium	mg/kg		199	199	1298	RESIDENTIAL04	06/14/2009	11 / 11	383.8
Manganese	mg/kg		0.603	0.603	15.52	RESIDENTIAL07	06/01/2009	11 / 11	3.503
Mercury	mg/kg	0.01934 / 0.03817	ND	0.02272	0.1048	RESIDENTIAL04	06/14/2009	4 / 11	0.04895
Molybdenum	mg/kg	0.9648 / 1.011	ND	ND	ND			0 / 11	0
Nickel	mg/kg	0.09648 / 0.1174	ND	0.1128	0.1128	RESIDENTIAL04	06/14/2009	1 / 11	0.1128
Potassium	mg/kg		2023	2023	5441	RESIDENTIAL04	06/14/2009	11 / 11	2558
Selenium	mg/kg		0.8512	0.8512	3.708	RESIDENTIAL04	06/14/2009	11 / 11	1.291
Silver	mg/kg	0.04824 / 0.05152	ND	ND	ND			0 / 11	0
Sodium	mg/kg		1017	1017	3796	RESIDENTIAL04	06/14/2009	11 / 11	1483
Strontium	mg/kg		1.166	1.166	31.6	RESIDENTIAL04	06/14/2009	11 / 11	7.945
Thallium	mg/kg	0.09648 / 0.1011	ND	ND	ND			0 / 11	0
Vanadium	mg/kg	0.1934 / 0.2029	ND	ND	ND			0 / 11	0
Zinc	mg/kg		26.8	26.8	107.2	RESIDENTIAL04	06/14/2009	11 / 11	38.26

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 31. 2010 Tree Swallow Nestling Sampling at Emory River Mile 3.0

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		63.80	63.80	72.70	ERM3.0	05/26/2010	15 / 15	67.52
Aluminum	mg/kg	3.782 / 4.166	ND	4.25	4.25	ERM3.0	05/27/2010	1 / 15	4.25
Antimony	mg/kg	0.01369 / 0.01509	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.02641 / 0.02926	ND	ND	ND			0 / 15	0
Barium	mg/kg		0.6741	0.6741	5.93	ERM3.0	05/24/2010	15 / 15	1.933
Beryllium	mg/kg	0.02771 / 0.0603	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.1284 / 0.4452	ND	0.4186	0.4186	ERM3.0	05/27/2010	1 / 15	0.4186
Cadmium	mg/kg	0.00234 / 0.01562	ND	0.00828	0.0273	ERM3.0	05/26/2010	13 / 15	0.01592
Calcium	mg/kg		941.4	941.4	10453	ERM3.0	06/02/2010	15 / 15	5637
Chromium	mg/kg	0.1206 / 0.1316	ND	0.4648	0.4648	ERM3.0	06/02/2010	1 / 15	0.4648
Cobalt	mg/kg	0.01337 / 0.01463	ND	ND	ND			0 / 15	0
Copper	mg/kg		2.185	2.185	3.551	ERM3.0	05/24/2010	15 / 15	2.667
Iron	mg/kg		46.9	46.9	80.32	ERM3.0	06/02/2010	15 / 15	68.77
Lead	mg/kg	0.02608 / 0.02894	ND	0.03685	0.03685	ERM3.0	05/24/2010	1 / 15	0.03685
Magnesium	mg/kg		242.7	242.7	421.5	ERM3.0	06/02/2010	15 / 15	329.1
Manganese	mg/kg		0.7935	0.7935	2.999	ERM3.0	06/02/2010	15 / 15	1.613
Mercury	mg/kg		0.01843	0.01843	0.03852	ERM3.0	06/03/2010	15 / 15	0.03074
Molybdenum	mg/kg	0.0331 / 0.0636	ND	0.05474	0.06552	ERM3.0	05/26/2010	7 / 15	0.06035
Nickel	mg/kg	0.09128 / 0.1027	ND	0.1231	0.1926	ERM3.0	06/02/2010	2 / 15	0.1579
Potassium	mg/kg		2277	2277	2926	ERM3.0	06/01/2010	15 / 15	2650
Selenium	mg/kg		0.9184	0.9184	1.374	ERM3.0	05/24/2010	15 / 15	1.101
Silver	mg/kg	0.00274 / 0.00871	ND	ND	ND			0 / 15	0
Sodium	mg/kg		1097	1097	1521	ERM3.0	05/26/2010	15 / 15	1298
Strontium	mg/kg		1.38	1.38	12.13	ERM3.0	05/24/2010	15 / 15	4.509
Thallium	mg/kg	0.01304 / 0.01445	ND	ND	ND			0 / 15	0
Vanadium	mg/kg	0.04238 / 0.09309	ND	ND	ND			0 / 15	0
Zinc	mg/kg		28.45	28.45	43.13	ERM3.0	05/26/2010	15 / 15	32.93

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 32. 2009 Tree Swallow Nestling Sampling at Emory River Mile 3.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		52.80	52.80	72.10	FARM07	06/04/2009	12 / 12	65.82
Aluminum	mg/kg	24.5 / 25.03	ND	ND	ND			0 / 12	0
Antimony	mg/kg	0.0984 / 0.1014	ND	ND	ND			0 / 12	0
Arsenic	mg/kg	0.0984 / 0.1014	ND	ND	ND			0 / 12	0
Barium	mg/kg		0.1427	0.1427	4.531	FARM07	06/14/2009	12 / 12	1.658
Beryllium	mg/kg	0.0984 / 0.1014	ND	ND	ND			0 / 12	0
Boron	mg/kg	1.971 / 2.001	ND	ND	ND			0 / 12	0
Cadmium	mg/kg	0.0984 / 0.1014	ND	ND	ND			0 / 12	0
Calcium	mg/kg		1243	1243	12555	FARM07	06/14/2009	12 / 12	5425
Chromium	mg/kg	0.09855 / 0.2648	ND	0.1752	0.1752	FARM02	06/08/2009	1 / 12	0.1752
Cobalt	mg/kg	0.0984 / 0.1014	ND	ND	ND			0 / 12	0
Copper	mg/kg		1.947	1.947	6.183	FARM07	06/14/2009	12 / 12	2.756
Iron	mg/kg		52.33	52.33	141.1	FARM07	06/14/2009	12 / 12	69.82
Lead	mg/kg	0.0984 / 0.1014	ND	ND	ND			0 / 12	0
Magnesium	mg/kg		161.7	161.7	599.4	FARM07	06/14/2009	12 / 12	302.4
Manganese	mg/kg	0.472 / 1.958	ND	0.5072	2.785	FARM07	06/14/2009	10 / 12	1.271
Mercury	mg/kg	0.0198 / 0.0357	ND	0.02013	0.05664	FARM07	06/14/2009	2 / 12	0.03839
Molybdenum	mg/kg	0.984 / 1.014	ND	ND	ND			0 / 12	0
Nickel	mg/kg	0.0984 / 0.1059	ND	0.5022	0.5022	FARM10	06/01/2009	1 / 12	0.5022
Potassium	mg/kg		1705	1705	4413	FARM07	06/14/2009	12 / 12	2422
Selenium	mg/kg		0.759	0.759	2.266	FARM07	06/14/2009	12 / 12	1.122
Silver	mg/kg	0.0472 / 0.0512	ND	ND	ND			0 / 12	0
Sodium	mg/kg		903.5	903.5	2983	FARM07	06/14/2009	12 / 12	1294
Strontium	mg/kg		0.634	0.634	8.685	FARM07	06/14/2009	12 / 12	3.513
Thallium	mg/kg	0.0984 / 0.1014	ND	ND	ND			0 / 12	0
Vanadium	mg/kg	0.1971 / 0.2001	ND	ND	ND			0 / 12	0
Zinc	mg/kg		21.83	21.83	66.08	FARM07	06/14/2009	12 / 12	32.89

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 33. 2010 Tree Swallow Nestling Sampling at Emory River Mile 3.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		65.20	65.20	72.20	ERM3.5	06/13/2010	10 / 10	69.34
Aluminum	mg/kg	3.718 / 4.132	ND	ND	ND			0 / 10	0
Antimony	mg/kg	0.01344 / 0.015	ND	ND	ND			0 / 10	0
Arsenic	mg/kg	0.02673 / 0.0566	ND	0.02866	0.03948	ERM3.5	06/15/2010	3 / 10	0.033
Barium	mg/kg		0.504	0.504	1.773	ERM3.5	05/28/2010	10 / 10	1.19
Beryllium	mg/kg	0.02746 / 0.03113	ND	ND	ND			0 / 10	0
Boron	mg/kg	0.3718 / 0.4245	ND	ND	ND			0 / 10	0
Cadmium	mg/kg	0.00708 / 0.0148	ND	0.0094	0.05474	ERM3.5	06/13/2010	9 / 10	0.02592
Calcium	mg/kg		3024	3024	14825	ERM3.5	06/06/2010	10 / 10	6634
Chromium	mg/kg	0.1173 / 0.1302	ND	0.1252	0.3119	ERM3.5	06/28/2010	4 / 10	0.1907
Cobalt	mg/kg	0.01316 / 0.01472	ND	ND	ND			0 / 10	0
Copper	mg/kg		2.031	2.031	3.528	ERM3.5	06/28/2010	10 / 10	2.571
Iron	mg/kg		55.77	55.77	78.75	ERM3.5	06/28/2010	10 / 10	64.67
Lead	mg/kg	0.02603 / 0.02869	ND	0.03336	0.03336	ERM3.5	06/13/2010	1 / 10	0.03336
Magnesium	mg/kg		262.4	262.4	525.5	ERM3.5	06/06/2010	10 / 10	347.4
Manganese	mg/kg		0.6615	0.6615	4.087	ERM3.5	06/13/2010	10 / 10	1.518
Mercury	mg/kg		0.02227	0.02227	0.03864	ERM3.5	06/13/2010	10 / 10	0.031
Molybdenum	mg/kg		0.0522	0.0522	0.07924	ERM3.5	06/25/2010	10 / 10	0.0645
Nickel	mg/kg	0.09152 / 0.1019	ND	0.138	0.1701	ERM3.5	06/28/2010	2 / 10	0.1541
Potassium	mg/kg		2219	2219	3141	ERM3.5	06/09/2010	10 / 10	2702
Selenium	mg/kg		0.8618	0.8618	1.355	ERM3.5	06/28/2010	10 / 10	1.053
Silver	mg/kg	0.00269 / 0.00738	ND	0.00547	0.01168	ERM3.5	06/13/2010	2 / 10	0.008577
Sodium	mg/kg		1190	1190	1782	ERM3.5	06/09/2010	10 / 10	1362
Strontium	mg/kg		2.029	2.029	5.846	ERM3.5	06/06/2010	10 / 10	3.815
Thallium	mg/kg	0.01287 / 0.0174	ND	ND	ND			0 / 10	0
Vanadium	mg/kg	0.04186 / 0.09339	ND	0.05355	0.05355	ERM3.5	06/28/2010	1 / 10	0.05355
Zinc	mg/kg		28.36	28.36	39.67	ERM3.5	06/06/2010	10 / 10	33.09

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 34. 2009 Tree Swallow Nestling Sampling at Clinch River Mile 2.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		59	59	74.90	DISCHARGE10	07/06/2009	11 / 11	65.82
Aluminum	mg/kg	24.56 / 41	ND	ND	ND			0 / 12	0
Antimony	mg/kg	0.0975 / 0.16	ND	ND	ND			0 / 12	0
Arsenic	mg/kg	0.0975 / 0.16	ND	ND	ND			0 / 12	0
Barium	mg/kg		0.3828	0.3828	7.7	DISCHARGE03	06/04/2009	12 / 12	1.913
Beryllium	mg/kg	0.0975 / 0.16	ND	ND	ND			0 / 12	0
Boron	mg/kg	1.95 / 3.3	ND	ND	ND			0 / 12	0
Cadmium	mg/kg	0.0975 / 0.16	ND	ND	ND			0 / 12	0
Calcium	mg/kg		1952	1952	29800	DISCHARGE03	06/04/2009	12 / 12	8105
Chromium	mg/kg	0.0975 / 0.2263	ND	ND	ND			0 / 12	0
Cobalt	mg/kg	0.0975 / 0.16	ND	0.3526	0.3526	DISCHARGE05	07/12/2009	1 / 12	0.3526
Copper	mg/kg		1.95	1.95	3.366	DISCHARGE05	05/28/2009	12 / 12	2.517
Iron	mg/kg		50.2	50.2	87.3	DISCHARGE03	06/04/2009	12 / 12	61.05
Lead	mg/kg	0.0975 / 0.16	ND	ND	ND			0 / 12	0
Magnesium	mg/kg		193.5	193.5	446.9	DISCHARGE06	06/01/2009	12 / 12	293.4
Manganese	mg/kg		0.578	0.578	5.7	DISCHARGE03	06/04/2009	12 / 12	1.749
Mercury	mg/kg	0.0195 / 0.02591	ND	0.02138	0.076	DISCHARGE03	06/04/2009	6 / 12	0.03596
Molybdenum	mg/kg	0.975 / 1.6	ND	ND	ND			0 / 12	0
Nickel	mg/kg	0.0975 / 0.16	ND	0.3972	0.3972	DISCHARGE06	06/01/2009	1 / 12	0.3972
Potassium	mg/kg		1774	1774	5470	DISCHARGE03	06/04/2009	12 / 12	2571
Selenium	mg/kg		1.004	1.004	2.2	DISCHARGE03	06/04/2009	12 / 12	1.221
Silver	mg/kg	0.04784 / 0.082	ND	ND	ND			0 / 12	0
Sodium	mg/kg		1017	1017	6370	DISCHARGE03	06/04/2009	12 / 12	1649
Strontium	mg/kg		1.292	1.292	16.7	DISCHARGE03	06/04/2009	12 / 12	4.814
Thallium	mg/kg	0.0975 / 0.16	ND	ND	ND			0 / 12	0
Vanadium	mg/kg	0.195 / 0.33	ND	ND	ND			0 / 12	0
Zinc	mg/kg		25.35	25.35	49.2	DISCHARGE03	06/04/2009	12 / 12	32.97

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 35. 2010 Tree Swallow Nestling Sampling at Clinch River Mile 2.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		65	65	73	CRM2.5	05/28/2010	15 / 15	68.77
Aluminum	mg/kg	3.606 / 4.131	ND	ND	ND			0 / 15	0
Antimony	mg/kg	0.01288 / 0.01487	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.02666 / 0.0572	ND	ND	ND			0 / 15	0
Barium	mg/kg		0.9724	0.9724	2.346	CRM2.5	05/28/2010	15 / 15	1.465
Beryllium	mg/kg	0.0264 / 0.05933	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.3666 / 0.432	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.00676 / 0.01505	ND	0.00983	0.02995	CRM2.5	05/31/2010	13 / 15	0.01799
Calcium	mg/kg		2806	2806	7503	CRM2.5	05/31/2010	15 / 15	4971
Chromium	mg/kg	0.1127 / 0.1277	ND	0.1539	1.173	CRM2.5	05/28/2010	3 / 15	0.4968
Cobalt	mg/kg	0.01256 / 0.01458	ND	0.0141	0.0141	CRM2.5	05/31/2010	1 / 15	0.0141
Copper	mg/kg		2.061	2.061	3.885	CRM2.5	06/01/2010	15 / 15	2.62
Iron	mg/kg		42.5	42.5	105.3	CRM2.5	05/31/2010	15 / 15	64.02
Lead	mg/kg	0.02512 / 0.0297	ND	0.03091	0.1011	CRM2.5	05/28/2010	2 / 15	0.06601
Magnesium	mg/kg		259.7	259.7	367.1	CRM2.5	05/31/2010	15 / 15	302.9
Manganese	mg/kg		0.6762	0.6762	2.611	CRM2.5	06/01/2010	15 / 15	1.519
Mercury	mg/kg		0.01958	0.01958	0.0423	CRM2.5	05/31/2010	15 / 15	0.02894
Molybdenum	mg/kg	0.03102 / 0.05817	ND	0.03762	0.08866	CRM2.5	05/28/2010	14 / 15	0.06451
Nickel	mg/kg	0.08694 / 0.0999	ND	0.1932	0.2202	CRM2.5	05/28/2010	2 / 15	0.2067
Potassium	mg/kg		2286	2286	2811	CRM2.5	06/01/2010	15 / 15	2509
Selenium	mg/kg		0.7084	0.7084	1.043	CRM2.5	05/31/2010	15 / 15	0.9125
Silver	mg/kg	0.00261 / 0.00297	ND	0.00316	0.00316	CRM2.5	05/28/2010	1 / 15	0.003162
Sodium	mg/kg		1236	1236	2054	CRM2.5	05/31/2010	15 / 15	1373
Strontium	mg/kg		1.803	1.803	5.356	CRM2.5	05/26/2010	15 / 15	3.197
Thallium	mg/kg	0.01224 / 0.0212	ND	ND	ND			0 / 15	0
Vanadium	mg/kg	0.04186 / 0.04704	ND	ND	ND			0 / 15	0
Zinc	mg/kg		28.02	28.02	51.84	CRM2.5	05/31/2010	15 / 15	33.46

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 36. 2009 Tree Swallow Nestling Sampling at Fort Loudoun Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		63.50	63.50	68.20	FLD02	06/21/2009	3 / 3	66
Aluminum	mg/kg	24.78 / 25.11	ND	ND	ND			0 / 3	0
Antimony	mg/kg	0.09855 / 0.1011	ND	ND	ND			0 / 3	0
Arsenic	mg/kg	0.09855 / 0.1011	ND	ND	ND			0 / 3	0
Barium	mg/kg		0.4718	0.4718	2.194	FLD02	06/21/2009	3 / 3	1.315
Beryllium	mg/kg	0.09855 / 0.1011	ND	ND	ND			0 / 3	0
Boron	mg/kg	1.971 / 2.022	ND	ND	ND			0 / 3	0
Cadmium	mg/kg	0.09855 / 0.1011	ND	ND	ND			0 / 3	0
Calcium	mg/kg		3808	3808	8213	FLD18	06/01/2009	3 / 3	6212
Chromium	mg/kg	0.1081 / 0.1247	ND	ND	ND			0 / 3	0
Cobalt	mg/kg	0.09855 / 0.1011	ND	ND	ND			0 / 3	0
Copper	mg/kg		2.056	2.056	3.721	FLD02	06/21/2009	3 / 3	3.021
Iron	mg/kg		59.65	59.65	85.41	FLD18	06/01/2009	3 / 3	75.28
Lead	mg/kg	0.09855 / 0.1011	ND	ND	ND			0 / 3	0
Magnesium	mg/kg		219.4	219.4	323.4	FLD18	06/01/2009	3 / 3	285.3
Manganese	mg/kg		0.8425	0.8425	2.226	FLD02	06/21/2009	3 / 3	1.68
Mercury	mg/kg	0.01971 / 0.02022	ND	ND	ND			0 / 3	0
Molybdenum	mg/kg	0.9855 / 1.011	ND	ND	ND			0 / 3	0
Nickel	mg/kg	0.09858 / 0.2154	ND	ND	ND			0 / 3	0
Potassium	mg/kg		1742	1742	2960	FLD18	06/01/2009	3 / 3	2251
Selenium	mg/kg		0.6066	0.6066	1.789	FLD18	06/01/2009	3 / 3	1.074
Silver	mg/kg	0.05055 / 0.0511	ND	ND	ND			0 / 3	0
Sodium	mg/kg		957.1	957.1	1205	FLD18	06/01/2009	3 / 3	1116
Strontium	mg/kg		1.988	1.988	5.256	FLD18	06/01/2009	3 / 3	4.005
Thallium	mg/kg	0.09855 / 0.1011	ND	ND	ND			0 / 3	0
Vanadium	mg/kg	0.1971 / 0.2022	ND	ND	ND			0 / 3	0
Zinc	mg/kg		25.65	25.65	33.71	FLD02	06/21/2009	3 / 3	30.75

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 37. 2010 Tree Swallow Nestling Sampling at Fort Loudoun Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		62.20	62.20	74	FLD	07/12/2010	10 / 10	68.08
Aluminum	mg/kg	3.728 / 4.141	ND	ND	ND			0 / 10	0
Antimony	mg/kg	0.01338 / 0.01509	ND	ND	ND			0 / 10	0
Arsenic	mg/kg	0.026 / 0.05678	ND	ND	ND			0 / 10	0
Barium	mg/kg		0.2688	0.2688	3.704	FLD	06/01/2010	10 / 10	1.394
Beryllium	mg/kg	0.02744 / 0.0305	ND	ND	ND			0 / 10	0
Boron	mg/kg	0.3773 / 0.4342	ND	ND	ND			0 / 10	0
Cadmium	mg/kg	0.0072 / 0.01518	ND	0.0078	0.02151	FLD	06/05/2010	7 / 10	0.0148
Calcium	mg/kg		2747	2747	11642	FLD	06/01/2010	10 / 10	5682
Chromium	mg/kg	0.1201 / 0.2389	ND	ND	ND			0 / 10	0
Cobalt	mg/kg	0.01303 / 0.01445	ND	ND	ND			0 / 10	0
Copper	mg/kg		2.009	2.009	2.541	FLD	06/01/2010	10 / 10	2.291
Iron	mg/kg		61.12	61.12	108.9	FLD	07/08/2010	10 / 10	78.66
Lead	mg/kg	0.02583 / 0.02889	ND	0.03024	0.9018	FLD	05/28/2010	2 / 10	0.466
Magnesium	mg/kg		216.3	216.3	487.6	FLD	06/01/2010	10 / 10	318.7
Manganese	mg/kg		0.7725	0.7725	1.456	FLD	07/12/2010	10 / 10	1.147
Mercury	mg/kg	0.01079 / 0.01188	ND	0.01166	0.01297	FLD	05/31/2010	3 / 10	0.01211
Molybdenum	mg/kg	0.0327 / 0.05966	ND	0.0567	0.08832	FLD	05/31/2010	9 / 10	0.06883
Nickel	mg/kg	0.09156 / 0.1838	ND	ND	ND			0 / 10	0
Potassium	mg/kg		2268	2268	3100	FLD	06/01/2010	10 / 10	2753
Selenium	mg/kg		0.52	0.52	1.325	FLD	05/31/2010	10 / 10	0.9562
Silver	mg/kg	0.00271 / 0.0091	ND	0.00288	0.00371	FLD	07/06/2010	2 / 10	0.003295
Sodium	mg/kg		1221	1221	1711	FLD	05/31/2010	10 / 10	1408
Strontium	mg/kg		1.174	1.174	4.838	FLD	06/01/2010	10 / 10	2.319
Thallium	mg/kg	0.01275 / 0.01412	ND	ND	ND			0 / 10	0
Vanadium	mg/kg	0.04116 / 0.08792	ND	ND	ND			0 / 10	0
Zinc	mg/kg		19.93	19.93	36.7	FLD	06/01/2010	10 / 10	30.08

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 38. 2009 Tree Swallow Nestling Sampling at Melton Hill Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		58.90	58.90	69.50	MHD12	06/01/2009	9 / 9	63.87
Aluminum	mg/kg	24.8 / 25.11	ND	ND	ND			0 / 9	0
Antimony	mg/kg	0.0985 / 0.1018	ND	ND	ND			0 / 9	0
Arsenic	mg/kg	0.0985 / 0.1018	ND	ND	ND			0 / 9	0
Barium	mg/kg		0.376	0.376	1.872	MHD25	05/28/2009	9 / 9	0.9328
Beryllium	mg/kg	0.0985 / 0.1018	ND	ND	ND			0 / 9	0
Boron	mg/kg	1.97 / 2.014	ND	ND	ND			0 / 9	0
Cadmium	mg/kg	0.0985 / 0.1018	ND	ND	ND			0 / 9	0
Calcium	mg/kg		1874	1874	8025	MHD02	05/28/2009	9 / 9	3818
Chromium	mg/kg	0.0985 / 0.2712	ND	ND	ND			0 / 9	0
Cobalt	mg/kg	0.0985 / 0.1018	ND	ND	ND			0 / 9	0
Copper	mg/kg		1.922	1.922	3.21	MHD02	05/28/2009	9 / 9	2.397
Iron	mg/kg		43.92	43.92	101.1	MHD02	05/28/2009	9 / 9	66.39
Lead	mg/kg	0.0985 / 0.1018	ND	ND	ND			0 / 9	0
Magnesium	mg/kg		207	207	316.2	MHD02	05/28/2009	9 / 9	245.9
Manganese	mg/kg		0.5338	0.5338	1.299	MHD25	05/28/2009	9 / 9	0.8592
Mercury	mg/kg	0.0197 / 0.02187	ND	0.02302	0.02302	MHD03	07/16/2009	1 / 9	0.02302
Molybdenum	mg/kg	0.985 / 1.018	ND	ND	ND			0 / 9	0
Nickel	mg/kg	0.0985 / 0.1757	ND	ND	ND			0 / 9	0
Potassium	mg/kg		1959	1959	2751	MHD02	05/28/2009	9 / 9	2264
Selenium	mg/kg		1.356	1.356	2.903	MHD01	06/01/2009	9 / 9	2.19
Silver	mg/kg	0.04836 / 0.05136	ND	ND	ND			0 / 9	0
Sodium	mg/kg		976.4	976.4	1169	MHD25	05/28/2009	9 / 9	1073
Strontium	mg/kg		1.128	1.128	3.595	MHD02	05/28/2009	9 / 9	1.806
Thallium	mg/kg	0.0985 / 0.1018	ND	ND	ND			0 / 9	0
Vanadium	mg/kg	0.197 / 0.2014	ND	ND	ND			0 / 9	0
Zinc	mg/kg		24.1	24.1	36.05	MHD14	06/04/2009	9 / 9	29.97

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 39. 2010 Tree Swallow Nestling Sampling at Melton Hill Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
% Moisture	%		64.20	64.20	72.40	MHD	06/16/2010	15 / 15	68.16
Aluminum	mg/kg	3.777 / 4.168	ND	ND	ND			0 / 15	0
Antimony	mg/kg	0.01372 / 0.01503	ND	ND	ND			0 / 15	0
Arsenic	mg/kg	0.02648 / 0.05678	ND	0.03069	0.0414	MHD	06/16/2010	2 / 15	0.03605
Barium	mg/kg		0.5304	0.5304	3.054	MHD	06/02/2010	15 / 15	1.564
Beryllium	mg/kg	0.02789 / 0.03073	ND	ND	ND			0 / 15	0
Boron	mg/kg	0.3883 / 0.4416	ND	ND	ND			0 / 15	0
Cadmium	mg/kg	0.00706 / 0.00749	ND	0.01423	0.04968	MHD	06/16/2010	14 / 15	0.02658
Calcium	mg/kg		2331	2331	8003	MHD	06/02/2010	15 / 15	4663
Chromium	mg/kg	0.1197 / 0.1319	ND	0.1483	1.197	MHD	06/08/2010	4 / 15	0.5701
Cobalt	mg/kg	0.01325 / 0.0147	ND	0.01372	0.01451	MHD	06/14/2010	2 / 15	0.01412
Copper	mg/kg		1.805	1.805	3.248	MHD	06/01/2010	15 / 15	2.497
Iron	mg/kg		56.58	56.58	89.94	MHD	06/08/2010	15 / 15	71.08
Lead	mg/kg	0.02648 / 0.02906	ND	ND	ND			0 / 15	0
Magnesium	mg/kg		245.2	245.2	478.9	MHD	06/08/2010	15 / 15	305.8
Manganese	mg/kg		0.4992	0.4992	2.457	MHD	06/02/2010	15 / 15	1.243
Mercury	mg/kg	0.01094 / 0.01123	ND	0.01438	0.02705	MHD	05/28/2010	14 / 15	0.01969
Molybdenum	mg/kg	0.03212 / 0.06318	ND	0.06012	0.09384	MHD	06/16/2010	10 / 15	0.07336
Nickel	mg/kg	0.09178 / 0.1006	ND	0.1002	0.5548	MHD	06/08/2010	3 / 15	0.3287
Potassium	mg/kg		2047	2047	2955	MHD	06/03/2010	15 / 15	2661
Selenium	mg/kg		0.5552	0.5552	2.482	MHD	06/08/2010	15 / 15	1.644
Silver	mg/kg	0.00276 / 0.00459	ND	0.00301	0.00301	MHD	05/28/2010	1 / 15	0.003006
Sodium	mg/kg		1189	1189	1533	MHD	06/08/2010	15 / 15	1396
Strontium	mg/kg		0.6864	0.6864	3.721	MHD	06/02/2010	15 / 15	2.16
Thallium	mg/kg	0.01306 / 0.03312	ND	ND	ND			0 / 15	0
Vanadium	mg/kg	0.04236 / 0.09369	ND	0.0966	0.3212	MHD	06/08/2010	2 / 15	0.2089
Zinc	mg/kg		15.57	15.57	35.05	MHD	06/16/2010	15 / 15	30.43

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 40. 2010 Tree Swallow Dead Nestling Sampling at Clinch River Mile 2.5

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	3.922 / 3.922	ND	ND	ND			0 / 1	0
Antimony	mg/kg	0.01425 / 0.01425	ND	ND	ND			0 / 1	0
Arsenic	mg/kg		0.0518	0.0518	0.0518	CRM2.5	05/26/2010	1 / 1	0.0518
Barium	mg/kg		5.495	5.495	5.495	CRM2.5	05/26/2010	1 / 1	5.495
Beryllium	mg/kg	0.05735 / 0.05735	ND	ND	ND			0 / 1	0
Boron	mg/kg		2.257	2.257	2.257	CRM2.5	05/26/2010	1 / 1	2.257
Cadmium	mg/kg		0.1166	0.1166	0.1166	CRM2.5	05/26/2010	1 / 1	0.1166
Calcium	mg/kg		1343	1343	1343	CRM2.5	05/26/2010	1 / 1	1343
Chromium	mg/kg	0.124 / 0.124	ND	ND	ND			0 / 1	0
Cobalt	mg/kg		0.03145	0.03145	0.03145	CRM2.5	05/26/2010	1 / 1	0.03145
Copper	mg/kg		4.681	4.681	4.681	CRM2.5	05/26/2010	1 / 1	4.681
Iron	mg/kg		36.82	36.82	36.82	CRM2.5	05/26/2010	1 / 1	36.82
Lead	mg/kg		0.037	0.037	0.037	CRM2.5	05/26/2010	1 / 1	0.037
Magnesium	mg/kg		283.1	283.1	283.1	CRM2.5	05/26/2010	1 / 1	283.1
Manganese	mg/kg		11.54	11.54	11.54	CRM2.5	05/26/2010	1 / 1	11.54
Mercury	mg/kg		0.01776	0.01776	0.01776	CRM2.5	05/26/2010	1 / 1	0.01776
Molybdenum	mg/kg		0.1221	0.1221	0.1221	CRM2.5	05/26/2010	1 / 1	0.1221
Nickel	mg/kg	0.0962 / 0.0962	ND	ND	ND			0 / 1	0
Potassium	mg/kg		1998	1998	1998	CRM2.5	05/26/2010	1 / 1	1998
Selenium	mg/kg		0.6105	0.6105	0.6105	CRM2.5	05/26/2010	1 / 1	0.6105
Silver	mg/kg		0.01591	0.01591	0.01591	CRM2.5	05/26/2010	1 / 1	0.01591
Sodium	mg/kg		2405	2405	2405	CRM2.5	05/26/2010	1 / 1	2405
Strontium	mg/kg		2.183	2.183	2.183	CRM2.5	05/26/2010	1 / 1	2.183
Thallium	mg/kg	0.01554 / 0.01554	ND	ND	ND			0 / 1	0
Vanadium	mg/kg	0.0444 / 0.0444	ND	ND	ND			0 / 1	0
Zinc	mg/kg		31.45	31.45	31.45	CRM2.5	05/26/2010	1 / 1	31.45

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Table 41. 2010 Tree Swallow Dead Nestling Sampling at Melton Hill Dam

Analyte	Units	Detection Limit Range	Minimum	Minimum Detected Result	Maximum Detected Result	Location of Maximum Detected Result	Date of Maximum Detected Result	Number of Detections / Samples	Mean of Detections
Aluminum	mg/kg	4.108 / 4.108	ND	ND	ND			0 / 1	0
Antimony	mg/kg	0.01487 / 0.01487	ND	ND	ND			0 / 1	0
Arsenic	mg/kg	0.02772 / 0.02772	ND	ND	ND			0 / 1	0
Barium	mg/kg		1.966	1.966	1.966	MHD	06/14/2010	1 / 1	1.966
Beryllium	mg/kg	0.06048 / 0.06048	ND	ND	ND			0 / 1	0
Boron	mg/kg	0.4284 / 0.4284	ND	ND	ND			0 / 1	0
Cadmium	mg/kg	0.00781 / 0.00781	ND	ND	ND			0 / 1	0
Calcium	mg/kg		6376	6376	6376	MHD	06/14/2010	1 / 1	6376
Chromium	mg/kg	0.131 / 0.131	ND	ND	ND			0 / 1	0
Cobalt	mg/kg	0.01436 / 0.01436	ND	ND	ND			0 / 1	0
Copper	mg/kg		1.764	1.764	1.764	MHD	06/14/2010	1 / 1	1.764
Iron	mg/kg		25.96	25.96	25.96	MHD	06/14/2010	1 / 1	25.96
Lead	mg/kg	0.02772 / 0.02772	ND	ND	ND			0 / 1	0
Magnesium	mg/kg		299.9	299.9	299.9	MHD	06/14/2010	1 / 1	299.9
Manganese	mg/kg		1.235	1.235	1.235	MHD	06/14/2010	1 / 1	1.235
Mercury	mg/kg		0.01184	0.01184	0.01184	MHD	06/14/2010	1 / 1	0.01184
Molybdenum	mg/kg	0.03528 / 0.03528	ND	ND	ND			0 / 1	0
Nickel	mg/kg	0.1008 / 0.1008	ND	ND	ND			0 / 1	0
Potassium	mg/kg	7434 / 7434	ND	ND	ND			0 / 1	0
Selenium	mg/kg		2.621	2.621	2.621	MHD	06/14/2010	1 / 1	2.621
Silver	mg/kg	0.00302 / 0.00302	ND	ND	ND			0 / 1	0
Sodium	mg/kg		2402	2402	2402	MHD	06/14/2010	1 / 1	2402
Strontium	mg/kg		2.596	2.596	2.596	MHD	06/14/2010	1 / 1	2.596
Thallium	mg/kg	0.01663 / 0.01663	ND	ND	ND			0 / 1	0
Vanadium	mg/kg	0.04788 / 0.04788	ND	ND	ND			0 / 1	0
Zinc	mg/kg		29.23	29.23	29.23	MHD	06/14/2010	1 / 1	29.23

Notes:

Data are presented in wet weight.
For definitions, see the Acronyms section.

Figures

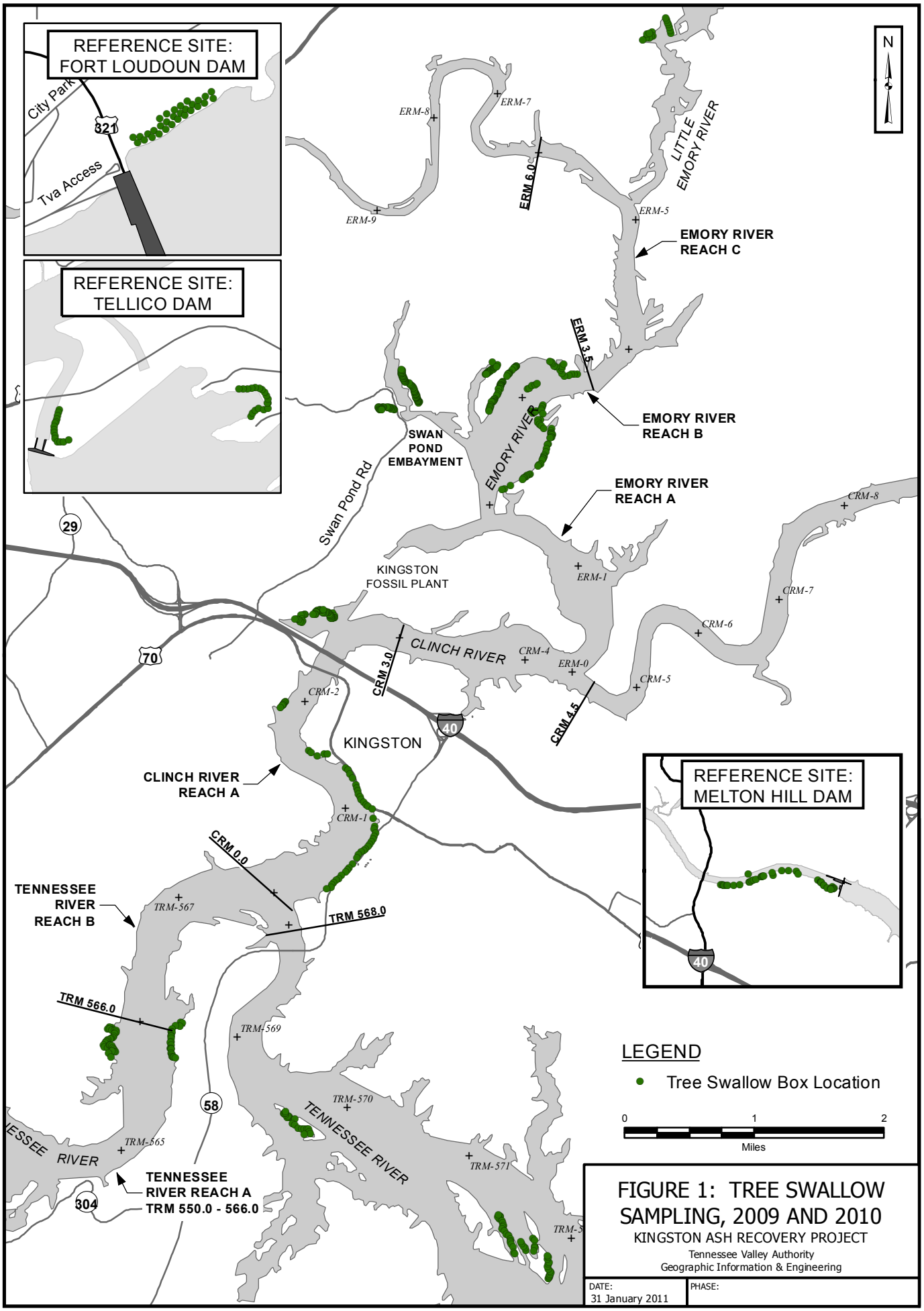

FIGURE 1: TREE SWALLOW SAMPLING, 2009 AND 2010

KINGSTON ASH RECOVERY PROJECT

Tennessee Valley Authority
Geographic Information & Engineering

DATE: 31 January 2011

PHASE:

Filename: BiotaMaps_TreeSwallow_20110127_8x11.pdf

Figure 2. Tree Swallow Box with Active Nest

Figure 3a. Tree Swallow Egg Collection

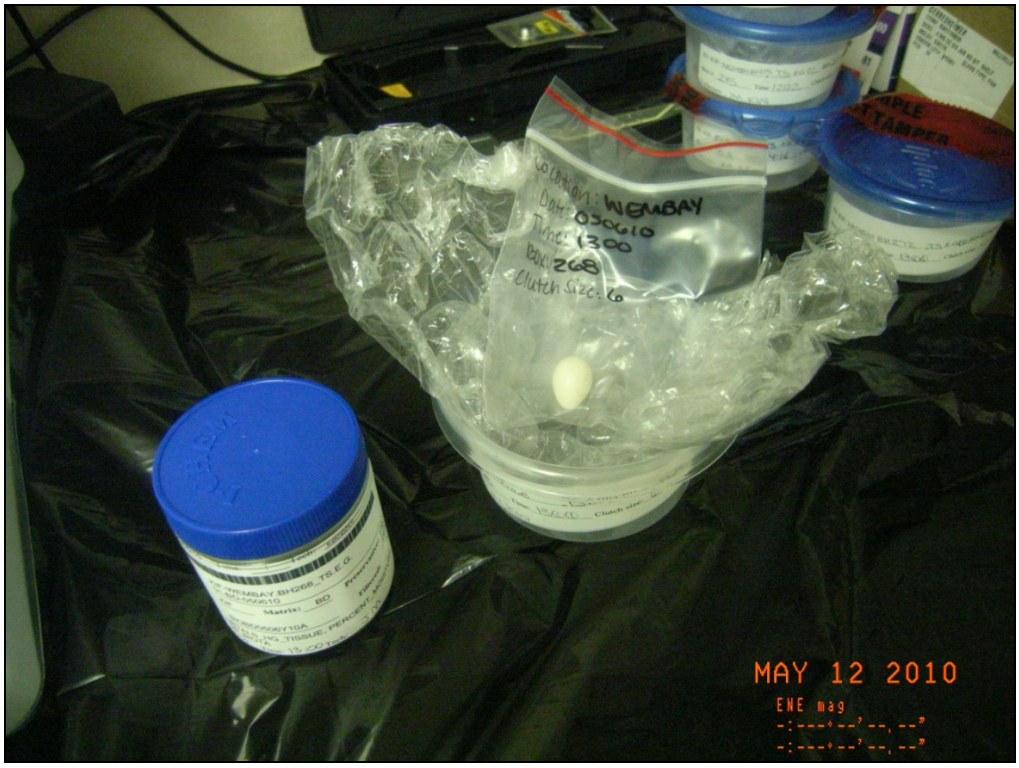

Figure 3b. Measurment of Tree Swallow Egg

Figure 4. Collection of Tree Swallow Nestling

Appendix A
Summary of Tree Swallow Collections

Table A-1. Summary of Tree Swallow Egg and Nestling Collections, 2009

Location	Type	Egg	Nestling
Ft. Loudoun Dam	Reference Sites	9	3
Melton Hill Dam[1]		17	9
Emory River Mile 3.5	Potentially Affected Sites	15	12
Emory River Mile 3.0- Right Bank		10	11
Clinch River Mile 2.5		12	12

Note: [1]Site has legacy constituents.

Table A-2. Summary of Tree Swallow Egg and Nestling Collections, 2010

Location		Sample Type				
Site Name	Type	Egg[1]		Nestling[2]		Eggshell
Ft. Loudoun Dam[3]	Reference Sites	16	+1	10	0	2
Melton Hill Dam[3, 4]		16	+4	15	+1	2
Tellico Dam		15	0	0	0	2
Little Emory River Mile 2.0		2	0	0	0	0
Tennessee River Mile 569.5 to 571.5		15	0	0	0	0
Emory River Mile 3.5[3]	Potentially Affected Sites	12	0	10	0	1
Emory River Mile 3.0- Right Bank[3]		15	0	15	0	4
Emory River Mile 3.0- Islands and Left Bank		15	0	0	0	2
West Embayment		2	0	0	0	1
North Embayment		4	0	0	0	1
East Embayment		4	0	0	0	2
Clinch River Mile 2.5[3]		15	+1	15	+1	0
Clinch River Mile 1.0		15	0	0	0	0
Tennessee River Mile 566.0		9	0	0	0	3

Notes:

[1]Number of eggs collected; (number of dud eggs, designated as "+").

[2]Number of live nestlings collected; (number of dead nestlings, designated as "+").

[3]Location for nestling collection.

[4]Site has legacy constituents.

Appendix B
Summary of Insectivorous Bird Shipments

Table B-1. Summary of Insectivorous Bird Shipments, 2009

Shipment Date	COCs Shipped	Sample Type		Total Samples per COC	Shipment Sample Total
		Eggs	Nestlings		
18-May-09	0BIOBD0508Y09a	20		20	38
	0BIOBD0508Y09b	181		18	
16-Jun-09	BIOBD0528Y09a	2	5	7	46
	BIOBD0601Y09a	6	11	17	
	BIOBD0604Y09a	5	8	13	
	BIOBD0608Y09a	1	2	3	
	BIOBD0614Y09a	3	3	6	
04-Aug-09	BIOBD0614Y09b		2	2	26
	BIOBD0616Y09a	3	1	4	
	BIOBD0621Y09a	4	2	6	
	BIOBD0625Y09a		1	1	
	BIOBD0701Y09a		2	2	
	BIOBD0706Y09a		2	2	
	BIOBD0712Y09a		4	4	
	BIOBD0716Y09a	1	3	4	
	BIOBD0724Y09a		1	1	
	Total	**63**	**47**	**110**	**110**

Note: For definitions, see the Acronyms list.

Table B-2. Summary of Insectivorous Bird Shipments, 2010

Shipment Date	COCs Shipped	Sample Type		Total Samples per COC	Shipment Sample Total
		Eggs	Nestlings		
13-May-10	BIOBD0504Y10A	13		13	87
	RSIBD0504Y10A	201		20	
	BIOBD0505Y10A	3		3	
	RSIBD0505Y10A	31		31	
	BIOBD0506Y10A	4		4	
	RSIBD0506Y10A	6		6	
	BIOBD0507Y10A	6		6	
	RSIBD0507Y10A	2		2	
	RSIBD0508Y10A	2		2	
19-May-10	BIOBD0510Y10A	15		15	45
	BIOBD0511Y10A	9		9	
	RSIBD0511Y10A	3		3	
	BIOBD0512Y10A	1		1	
	RSIBD0512Y10A	6		6	
	BIOBD0513Y10A	10		10	
	BIOBD0517Y10A	1		1	
27-May-10	BIOBD0518Y10A	2		2	11
	RSIBD0518Y10A	4		4	
	BIOBD0519Y10A	4		4	
	RSIBD0524Y10A		1	1	
03-Jun-10	RSIBD0526Y10A		2	2	18
	RSIBD0527Y10A		1	1	
	BIOBD0528Y10A		1	1	
	RSIBD0528Y10A		7	7	
	RSIBD0531Y10A		7	7	
17-Jun-10	RSIBD0601Y10A		11	11	41
	RSIBD0602Y10A	1	9	10	
	BIOBD0603Y10A	3		3	
	RSIBD0603Y10A	2	3	5	
	RSIBD0604Y10A		3	3	
	RSIBD0605Y10A		1	1	
	BIOBD0606Y10A		2	2	

Table B-2. Summary of Insectivorous Bird Shipments, 2010 (continued)

Shipment Date	COCs Shipped	Sample Type		Total Samples per COC	Shipment Sample Total
		Eggs	Nestlings		
17-Jun-10	RSIBD0607Y10A		3	3	
	RSIBD0608Y10A		1	1	
	BIOBD0609Y10A		1	1	
	RSIBD0609Y10A	1		1	
24-Jun-10	BIOBD0611Y10A		1	1	11
	RSIBD0611Y10A	1		1	
	BIOBD0613Y10A		2	2	
	RSIBD0614Y10A	1	1	2	
	BIOBD0615Y10A		1	1	
	RSIBD0615Y10A	1		1	
	RSIBD0616Y10A		1	1	
	RSIBD0617Y10A	2		2	
29-Jul-10	BIOBD0625Y10A		1	1	6
	BIOBD0628Y10A		1	1	
	RSIBD0706Y10A		1	1	
	RSIBD0707Y10A		1	1	
	RSIBD0708Y10A		1	1	
	RSIBD0712Y10A		1	1	
08-Sep-10	RSIBD0526Y10B		12	1	11
	RSIBD0607Y10B	13		1	
	RSIBD0608Y10B	63		6	
	RSIBD0608Y10C	13		1	
	RSIBD0614Y10B	13	12	2	
07-Oct-10	BIOBD0512Y10B	1		1	1
	Total	**164**	**67**	**231**	**231**

Note: For definitions, see the Acronyms list.