Final Report:

Chironomus dilutus* Partial Life Cycle and *Hyalella azteca
28-Day Whole Sediment Toxicity Test Results
for
Tennessee Valley Authority-Kingston Monitoring and Analysis Project:
Emory River Sediment Samples

Prepared for:

Rick M. Sherrard, Ph.D.
Senior Toxicologist
Tennessee Valley Authority
1101 Market St, PSC 1X-C
Chattanooga, TN 37402

Prepared by:

GLEC
Great Lakes Environmental Center

739 Hastings Street
Traverse City, MI 49686

Ph.: 231/941-2230
Fax: 231/941-2240

October 11, 2011

Executive Summary

Great Lakes Environmental Center, Inc. (GLEC), via a contract with the Tennessee Valley Authority (TVA), conducted definitive whole sediment toxicity tests with samples of Emory River sediment to evaluate effects on survival, growth, and emergence for *Chironomus dilutus* and survival and growth for *Hyalella azteca*. There were a total of eight Emory River sediment samples previously delivered to GLEC for analysis and of those eight, five (ERM 0.5, ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5) were used for whole sediment toxicity tests. The whole sediment toxicity tests were performed with four of the five investigative sediment samples for each test organism at six sediment dilution concentrations (10%, 20%, 40%, 60%, 80%, and 100%), one laboratory control sediment, and one reference control sediment sample. The sediment dilutions were prepared by thoroughly mixing the investigative sediment with Emory River reference sediment to achieve the desired test concentration. The investigative and reference sediment samples were collected from predetermined locations in the Emory River. TVA selected the sediment samples used in *C. dilutus* and *H. azteca* long-term tests based on the results of physical and chemical analysis of whole sediment samples, and on 10-day whole sediment toxicity test results with the same test organisms and samples. The Emory River is one of three rivers that were impacted by a fly ash spill at the Kingston Fossil Plant. These whole sediment toxicity tests are part of a large TVA project entitled "Kingston Monitoring and Analysis Project".

The investigative sediment samples used in the *C. dilutus* partial life cycle whole sediment toxicity tests were ERM 0.5, ERM 1.0, ERM 2.5, and ERM 3.5. The investigative sediment samples ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5 were used in the 28-day *H. azteca* whole sediment toxicity tests. Surface water collected from the Emory River was used as the overlying water in exposures to the investigative sediment samples, the reference control sediment, and the laboratory control sediment. These tests were conducted following the U.S. Environmental Protection Agency (EPA) and the American Society Testing and Materials (ASTM) whole sediment toxicity test methods for determining toxicity. The endpoints of the *C. dilutus* partial life cycle whole sediment toxicity tests were 20-day survival, 20-day growth [average Ash-Free-Dry-Weight (AFDW) and biomass], partial life cycle survival (percent survival including all live larvae, pupae, and emerged organisms), and percent emergence. The endpoints of the 28-day *H. azteca* whole sediment toxicity tests were survival and growth (average dry weight and biomass). The *C. dilutus* and *H. azteca* definitive whole sediment toxicity tests were performed July 15 through September 14, 2011 and July 12 through August 09, 2011, respectively.

All survival, growth and emergence results from the *C. dilutus* toxicity tests and the survival and growth results from the *H. azteca* toxicity tests were statistically compared to the survival and growth results from the reference sediment sample (Emory River reference control sediment) collected upstream of the spill site on the Emory River. All the control samples for the *C. dilutus* whole sediment toxicity tests met the performance criteria for 20-day survival, 20-day growth (average AFDW and biomass), as well as the test termination endpoints of partial life cycle percent survival and percent emergence. All four of the investigative sediment samples ERM 0.5, ERM 1.0, ERM 2.5, and ERM 3.5 showed a significant effect on *C. dilutus* 20-day growth (average AFDW and biomass), partial life cycle survival and percent emergence when compared

to the Emory River reference control sediment as follows: ERM 0.5 ($IC_{25\ GROWTH}$ = 83.2% , $IC_{25\ BIOMASS}$ = 82.8%, $IC_{25\ PARTIAL\ LIFE\ CYCLE\ SURVIVAL}$ = 70.6%, and $IC_{25\ EMERGENCE}$ = 64.2%), ERM 1.0 ($IC_{25\ GROWTH}$ = 90.3% , $IC_{25\ BIOMASS}$ = 84.9%, $IC_{25\ PARTIAL\ LIFE\ CYCLE\ SURVIVAL}$ = 66.6%, and $IC_{25\ EMERGENCE}$ = 65.4%), ERM 2.5 ($IC_{25\ GROWTH}$ = 43.9% , $IC_{25\ BIOMASS}$ = 40.5%, $IC_{25\ PARTIAL\ LIFE\ CYCLE\ SURVIVAL}$ = 46.0%, and $IC_{25\ EMERGENCE}$ = 45.4%), and ERM 3.5 ($IC_{25\ GROWTH}$ = 46.9% , $IC_{25\ BIOMASS}$ = 49.9%, $IC_{25\ PARTIAL\ LIFE\ CYCLE\ SURVIVAL}$ = 48.5%, and $IC_{25\ EMERGENCE}$ = 46.9%). After 61 days, one investigative sediment sample; ERM 2.5, showed a statistically significant reduction in the survival (IC_{25} = 86.8%) for the *C. dilutus* whole sediment toxicity tests.

The 28-day *H. azteca* survival and growth endpoints for all the control samples also met the required performance criteria for the whole sediment toxicity tests. The 28-day *H. azteca* survival was statistically different in two of the four investigative samples; ERM 2.5 and ERM 3.5 when compared to the Emory River reference control sediment. However, growth and biomass showed a statistical reduction in all four investigative sediment samples when compared to the Emory River reference control sediment sample as follows: ERM 1.0 ($IC_{25\ GROWTH}$ = 88.0%; $IC_{25\ BIOMASS}$ = 77.1%): ERM 2.5 ($IC_{25\ GROWTH}$ = 19.5%; $IC_{25\ BIOMASS}$ = 42.7%): ERM 3.5 ($IC_{25\ GROWTH}$ = 41.6%; $IC_{25\ BIOMASS}$ = 37.8%) and ERM 5.5 ($IC_{25\ GROWTH}$ = 88.7%; $IC_{25\ BIOMASS}$ = 86.0%).

Non-linear dose-responses in samples ERM 0.5 and ERM 3.5 were noted in the *C. dilutus* test and with sample ERM 2.5 in the *H. azteca* test.

Introduction

Great Lakes Environmental Center, Inc. (GLEC) under contract with the Tennessee Valley Authority (TVA), conducted and completed the analysis of definitive long-term survival, growth, and emergence whole sediment toxicity tests for *Chironomus dilutus* and survival and growth 28-day whole sediment toxicity tests for *Hyalella azteca*. There were a total of eight Emory River sediment samples previously delivered to GLEC for analysis and of those eight, five (ERM 0.5, ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5) were used for whole sediment toxicity tests. The whole sediment toxicity tests were performed with four of the five Emory River investigative sediment samples for each test organism at six test concentrations (10%, 20%, 40%, 60%, 80%, and 100%), one laboratory control sediment, and one reference control sediment sample. All investigative sediment samples and the reference control sediment sample were collected from the Emory River by the Tennessee Valley Authority (TVA) and Restoration Services, Inc. (RSI).

Emory River sediment samples ERM 0.5, ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5 were previously collected by TVA and RSI. The investigative sediment samples used in the long-term *C. dilutus* and 28-day *H. azteca* whole sediment toxicity tests were selected based on previous 10-day screening whole sediment toxicity test results and sediment physical and chemical analysis with each sample. The investigative sediment samples used for the *C. dilutus* partial life cycle (endpoints: survival, growth, and emergence) whole sediment toxicity tests were: ERM 0.5, ERM 1.0, ERM 2.5, and 3.5. The 28-day *H. azteca* survival and growth whole sediment toxicity tests were performed with investigative sediment samples ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5. The sediment dilutions were prepared by thoroughly mixing portions of the investigative sediment with Emory River reference sediment to achieve the desired test concentration. Reference sediment was collected upstream of the spill site on the Emory River at river mile 9.0. All survival, growth, and emergence results were statistically compared to the Emory River reference control sediment sample results. Statistical analysis were performed to provide the following endpoints: No-Observed-Effect-Concentration (NOEC), Lowest-Observed-Effect-Concentration (LOEC) and IC_{25} (25 percent inhibition concentration) estimates. Surface water collected from the Emory River upstream of the spill site was used as the overlying water in the toxicity tests.

As outlined in the TVA Kingston sediment study design, laboratory control sediment and water only control exposures were also analyzed during the testing period for the whole sediment toxicity tests. The overlying water for the water only and the additional laboratory control sediment tests was dechlorinated Traverse City, Michigan municipal tap water (originated from Lake Michigan). The laboratory control sediment and water only control tests were used to measure the test acceptability and the health of the test organisms.

The sample identification numbers, *C. dilutus* whole sediment survival, growth, and emergence and the *H. aztceca* whole sediment survival and growth toxicity test results for the four sediment samples are summarized in the following tables.

- Table 1: 20-Day *C. dilutus* Summary of Randomly Selected Replicates
- Tables 2, 3, 4, and 5: ERM 0.5: 20-Day *C. dilutus* Average Percent Survival, Growth (expressed as average ash-free-dry-weight (AFDW) and Biomass); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence
- Tables 6, 7, 8, and 9: ERM 1.0: 20-Day *C. dilutus* Average Percent Survival, Growth (AFDW and Biomass); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence
- Tables 10, 11, 12, and 13: ERM 2.5: 20-Day *C. dilutus* Average Percent Survival, Growth (AFDW and Biomass); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence
- Tables 14, 15, 16, and 17: ERM 3.5: 20-Day *C. dilutus* Average Percent Survival, Growth (AFDW and Biomass); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence
- Tables 18, 19, 20, and 21: Control Data: 20-Day *C. dilutus* Average Percent Survival, Growth (AFDW and Biomass); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence
- Table 22: Summary of NOEC, LOEC, and IC_{25} for 20-Day *C. dilutus* Average Percent Survival, Growth (AFDW and Biomass); Partial Life Cycle Survival, and Percent Emergence
- Tables 23, 24, and 25 Summary of Water Quality Data for the Overlying water from *C. dilutus* Partial Life Cycle tests
- Tables 26 and 27: ERM 1.0: 28-Day *H. azteca* Average Percent Survival, Growth (Average Dry Weight and Biomass)
- Tables 28 and 29: ERM 2.5: 28-Day *H. azteca* Average Percent Survival, Growth (Average Dry Weight and Biomass)
- Tables 30 and 31: ERM 3.5: 28-Day *H. azteca* Average Percent Survival, Growth (Average Dry Weight and Biomass)
- Tables 32 and 33: ERM 5.5: 28-Day *H. azteca* Average Percent Survival, Growth (Average Dry Weight and Biomass)
- Tables 34 and 35: Control Data: 28-Day *H. azteca* Average Percent Survival, Growth (Average Dry Weight and Biomass)

- Table 36: Summary of NOEC, LOEC, and IC_{25} Estimates, for 28-Day *H. azteca* Average Percent Survival, Growth (Average Dry Weight and Biomass)
- Tables 37, 38, and 39 Summary of Water Quality Data for the Overlying water from the 28-Day *H. azteca* tests
- Table 40 Summary of Water Quality Data for the Emory River Mile 9.0 Water Batches at Beginning Use and Near Depletion

Water quality data for the overlying water for each sediment sample tested are summarized in Tables 23, 24, and 25 for the *C. dilutus* tests, and Tables 37, 38 and 39 for the *H. azteca* tests.

Chain of Custody forms are provided in Appendix A. A detailed summary of sediment weight and of the overlying water quality measurements are provided in Appendix B and C, respectively. The statistical results for the *C. dilutus* survival and growth whole sediment toxicity tests are provided in Appendix D. *C. dilutus* partial life cycle and percent emergence statistical data are provided in Appendix E. The statistical results for survival and growth in the *H. azteca* whole sediment toxicity tests are provided in Appendix F. The reference toxicant data control charts are provided in Appendix G. The daily laboratory bench data sheets are maintained in files at GLEC, and are also provided on the enclosed compact diskettes.

MATERIALS and METHODS

This study was performed at GLEC's Traverse City, Michigan laboratory following GLEC's written protocols, which are based on the procedures outlined by: EPA/600/R-99/064 *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates*, Second Edition; ASTM 1706-95B, *Standard Test Methods for Measuring the Toxicity of Sediment Associated Contaminants with Freshwater Invertebrates* (ASTM 2000); and GLEC Standard Operating Procedures (SOPs).

Sediment and Overlying Water Samples

The Emory River reference control sediment was a 50:50 composite sample collected by TVA and RSI from two reference locations upstream of the spill site on the Emory River. The laboratory control sediment was a reference sediment collected from the Boardman River, a local stream with nearly a 100 percent forested watershed, located in the Pere Marquette State Forest, near Traverse City, MI.

The investigative sediment samples designated for each test organism and one reference sediment were previously collected by TVA and RSI on May 23 through May 25, 2011, and shipped to the GLEC laboratory via a refrigerated carrier on June 02, 2011. The samples were received at GLEC on June 03, 2011. Upon arrival at GLEC the samples were assigned unique GLEC laboratory identification numbers and stored in the dark at approximately 4°C (0-6°C) until test initiation. These investigative sediment samples had also been previously used in

conducting 10-day (screening) whole sediment toxicity tests from June 07 through June 17, 2011.

The investigative sediment samples received on June 03, 2011 were in good condition upon arrival at GLEC laboratory (i.e., no leaking containers, all custody seals intact), but the investigative sediment sample ERM 5.5 (two sample containers) exceeded the acceptable temperature range of 0-6°C, as stated in the "TVA Kingston Sediment Study Design". Upon arrival at GLEC laboratory, the temperature of the two containers for investigative sediment sample ERM 5.5 was 6.3°C and 6.7°C.

The surface water (collected from the Emory River and used as the overlying water for the whole sediment toxicity tests) was also collected by TVA and RSI and shipped to the GLEC laboratory via a refrigerated carrier. The surface water was collected on a regular schedule to provide water throughout the duration of the definitive *C. dilutus* and *H. azteca* whole sediment toxicity tests.

A batch of surface water collected on August 02, 2011 and received on August 03, 2011 also had twelve of the 240 cubitainers delivered outside of the acceptable temperature range. The temperature of the twelve cubitainers ranged from 6.2°C -7.8°C. In both instances, for the water and sediment, Rick Sherrard from TVA was notified (via phone and e-mail) of the temperature exceedances, and he approved the use of the sediment and surface water samples for whole sediment toxicity testing. All temperature exceedances were noted on Chain of custody forms, sample check-in forms and sample check-in discrepancy/comment forms (Appendix A).

Sample identification and collection information for sediments and water is provided in the table below.

Sample I.D.	GLEC Lab. ID Number	Date Sampled	Date Received
Emory Reference Sediment	8981	May 25, 2011	June 03, 2011
ERM 0.5	8982	May 23, 2011	June 03, 2011
ERM 1.0	8984	May 23, 2011	June 03, 2011
ERM 2.5	8985	May 23, 2011	June 03, 2011
ERM 3.5	8987	May 24, 2011	June 03, 2011
ERM 5.5	8989	May 24, 2011	June 03, 2011
Emory River Water –ERM 9.0	9002	July 06, 2011	July 08, 2011
Emory River Water –ERM 9.0	9009	July 13, 2011	July 15, 2011
Emory River Water –ERM 9.0	9016	July 18, 2011	July 20, 2011
Emory River Water –ERM 9.0	9023	July 20, 2011	July 22, 2011
Emory River Water –ERM 9.0	9031	July 27, 2011	July 29, 2011
Emory River Water –ERM 9.0	9032	August 02, 2011	August 03, 2011
Emory River Water –ERM 9.0	9037	August 10, 2011	August 12, 2011
Emory River Water –ERM 9.0	9049	August 17, 2011	August 19, 2011
Emory River Water –ERM 9.0	9059	August 24, 2011	August 26, 2011
Emory River Water –ERM 9.0	9062	August 31, 2011	September 02, 2011

The 28-day *H. azteca* toxicity tests were initiated on July 12, 2011 with each of the four selected investigative sediment samples (ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5) at six test concentrations (10%, 20%, 40%, 60%, 80% and 100%), Emory River reference sediment, two laboratory control sediments and one water only exposure with 8 replicate test chambers per test concentration and controls. The partial life cycle *C. dilutus* toxicity tests were initiated on July 15, 2011, with each of the four selected investigative sediment samples (ERM 0.5, ERM 1.0, ERM 2.5, and ERM 3.5) at six concentrations (10%, 20%, 40%, 60%, 80% and 100%), Emory River reference sediment, two laboratory control sediments and one water only exposure. The surface water collected from the Emory River (ERM 9.0) was used as the overlying water in each of the toxicity tests. Laboratory water (de-chlorinated tap water) was used as the overlying water in one laboratory control sediment and in the water-only control exposures.

General Procedures for All Test Exposures

Exposures were conducted in 470 mL glass test chambers, each containing 100 mL of whole sediment and 175 mL of overlying water. Prior to adding the whole sediment to each test chamber, the control and investigative sediments were separately homogenized using a pre-cleaned, stainless steel, all purpose mixer and a power drill until a uniform color and texture was achieved. After thorough homogenization, measured volumes of each investigative and reference sediment were weighed on a top loading balance to determine the average density (grams/unit volume) for each sample. Although sediment dilutions were prepared by volume, average densities were used as a quality control check for the prepared test sediment concentrations (Appendix B). For each sediment test concentration, the investigative sediment and Emory River reference sediment were combined in a pre-cleaned stainless steel bowl, and thoroughly homogenized with a pre-cleaned stainless steel spoon.

The sediment mixture was then added to each replicate test chamber using the pre-cleaned stainless steel spoon. After the addition of the sediment to the test chambers, the overlying water was immediately added; this was considered to be test day -1 (July 11, 2011 for *H. azteca* and July 14, 2011 for *C. dilutus*). Test organisms were added the day following the addition of sediment and overlying water and this day represented test day 0.

Overlying water was intermittently supplied to each test chamber at least twice daily (once every 12-hours) via a static-renewal water delivery system. The overlying water for the Emory River reference control, the investigative sediment samples, and one of the laboratory controls was Emory River site water (ERM 9.0), which had an average hardness of 132 mg/L and an average alkalinity of 106 mg/L. The overlying water for the second laboratory control sediment and the water only control was de-chlorinated municipal tap (Lake Michigan) water, with an average hardness of 126 mg/L and an average alkalinity of 110 mg/L. Temperature, dissolved oxygen, pH, and specific conductance of the overlying waters were measured daily prior to adding to the test chambers. The hardness, alkalinity, and total ammonia (as N) of Emory River surface water was measured at the beginning use of each batch and when the Emory River water batch was

nearly depleted. The water quality measurements were recorded in a project specific log book and are summarized in Table 40.

The *C. dilutus* test chambers were each fed 1.5 mL of Tetrafin® goldfish food slurry (4 mg/mL dry solids) once daily. The *C. dilutus* feeding rate was reduced to 1.0 mL Tetrafin® when dissolved oxygen concentrations dropped to ≤2.5 mg/L. The *H. azteca* test chambers were fed 1.0 mL mixture of yeast, trout food, and cerophyl (YTC, 1,800 mg/L solids) once daily.

The test chambers were placed in a temperature controlled water bath under the specified conditions of 23 ± 1°C; photoperiod 16 hours light:8 hours dark; and a light intensity of 349-496 lux (acceptable range 100-1000 lux).

Temperature was measured daily in two randomly selected replicate test chambers. Conductivity was measured weekly, and DO and pH were measured at least three times per week from two randomly selected replicate test chambers. The number of DO measurements was increased if the DO concentration fell more than 1 mg/L in one day, or when the DO concentration fell below 2.5 mg/L. If the DO concentration dropped below 2.5 mg/L, the number of daily overlying water renewals was increased (up to 4 times per day) for all treatments until the DO concentration recovered to greater than 3.0 mg/L. Once the DO concentration had increased to above 3.0 mg/L, additional water renewals were suspended, until the DO values dropped again to below 2.5 mg/L.

Hardness, alkalinity, and total ammonia (as N) were measured in test exposures on Day 0 (test initiation), at day 20, and at test termination for the *C. dilutus* whole sediment toxicity test (Tables 23, 24, and 25). The test exposure water quality measurements (alkalinity, hardness, and total ammonia (as N)) for the *H. azteca* whole sediment toxicity test were determined on test days 0 (test initiation) and 28 (test termination), and are summarized in Tables 37, 38, and 39. The alkalinity, hardness, and total ammonia (as N) samples were a composite sample collected from all replicates of a given treatment. All test exposure water quality measurements were recorded on the laboratory bench data sheets (see enclosed compact disc).

Observations of organism behavior and any anomalies observed in the test chamber were made daily and recorded on the laboratory bench data sheets.

A statistical analysis, using the program TOXCALC, (version 5.0.32) and following statistical guidelines provided in EPA Method 600/R-99/064 and ASTM Method 1706-95B (2000), was used to compare the survival, growth (measured as average dry weight or AFDW, and biomass), and emergence in the treatments with a single control. Growth was defined as either a change in the average dry weight or AFDW of the test organisms and as a change in the biomass of the test organisms. All survival, growth, and emergence endpoints were evaluated statistically to provide No-Observed-Effect-Concentration (NOEC), Lowest-Observed-Effect-Concentration (LOEC), and IC_{25} (25% Inhibition Concentration) estimates.

Prior to analysis, all percent survival (including partial life cycle survival), and percent emergence data were transformed using an arc sine-square root transformation. The growth and

biomass data were not arc sine-square root transformed prior to analysis. All transformed and untransformed data were tested for normality and homogeneity of variances using the Shapiro-Wilk Test or Kolmogorov D Test and Bartlett's test, respectively. An analysis of variance (ANOVA) was conducted using the most appropriate parametric (e.g., Dunnet's or Bonferroni tests) statistical model If the data failed to meet the assumptions of normality or homogeneity, then a nonparametric test (e.g., Steel's Many-One Rank or Wilcoxon with Bonferroni Adjustment) was used to analyze the data. In addition, the data were analyzed using linear interpolation, a non-point estimate endpoint, to calculate an IC_{25} value.

The survival, growth, and emergence for each treatment of investigative samples was considered statistically different when significantly lower ($p < 0.05$) than observed in the Emory River reference control sediment.

Test Method Specifics for Partial Life Cycle *Chironomus dilutus*

Newly-hatched *C. dilutus* larvae (< 24 hours old from egg cases purchased from Aquatic BioSystems) were used to initiate the long-term *C. dilutus* whole sediment toxicity tests. Hatching larvae were collected using a dissecting microscope and glass Pasteur pipette then randomly placed in test chambers. *C. dilutus* were continuously exposed to the test sediments for a period of 20-61 days. Consistent with the EPA method, each of the six treatments for each investigative sediment sample and all controls were initiated with twelve replicate beakers, and each replicate was initiated with 12 organisms.

On day 20, four of the twelve replicates were randomly selected from each of the six treatments for each investigative sediment sample and from the controls. The number of surviving *C. dilutus* was recorded for these four randomly selected replicates. The average ash free dry weight (AFDW) in milligrams (mg) of the surviving organisms for each of the selected *C. dilutus* replicates, and the biomass [AFDW (mg) of the surviving organisms divided by the initial number of organisms minus any pupae and emerged adults found on day 20] were also determined at test day 20. Due to a technician error, five random replicates were terminated on day 20 for investigative sediment sample ERM 1.0 at the 10 percent test concentration.

Exposures for the remaining eight (seven replicates for ERM 1.0-10% test concentration) replicates continued from day 20 to the end of the tests (up to 61 days) and were monitored daily for emergence. Daily recordings included dates of emergence and sex of emerged adults. Each treatment was terminated separately after no organisms had emerged for three consecutive days.

Partial life cycle endpoints included percent survival, percent emergence, average time to first emergence, and total percent cumulative emergence. For each treatment: percent survival was calculated as the sum of all live larvae and pupae found in the sediment at test termination plus all live, completely emerged adults, divided by the number of organisms at test initiation; percent emergence was calculated as the number of completely emerged live adults divided by the number of organisms at test initiation; average time to first emergence was calculated as the mean number of days to first emergence for all 8 replicates; total percent cumulative emergence

was calculated as the total number of emerged *C. dilutus* divided by the number of organisms at test initiation.

Test Method Specifics for 28-Day *Hyalella azteca*

Juvenile *H. azteca* (6-7 days old-cultured in house) were used to initiate the definitive whole sediment toxicity tests and were randomly placed in test chambers using a large bore pipette. Exposures continued for 28 days for each of the four selected investigative sediment samples at six test concentrations, the Emory River reference sediment sample, the two laboratory control sediments and one water only control exposure. Consistent with the EPA method, there were eight replicate beakers for each treatment and for all controls, with each replicate containing 10 organisms.

The number of surviving *H. azteca* in each replicate chamber was recorded at test termination. The average dry weight (mg) of the surviving organisms for each *H. azteca* replicate, and the biomass [dry weight (mg) of the surviving organisms divided by the initial number of organisms] was also determined at test termination.

RESULTS and DISCUSSION

GLEC Laboratory Control Sediment and Water Only Controls

Organisms exposed to the GLEC laboratory control sediment and the water only control exposures achieved the minimum survival and growth requirements, as specified in the EPA /600/R-99/064 manual (those requirements are discussed in the following results section for each set of toxicity tests). The laboratory control sediment with laboratory water and the water only control were used to assess test acceptability and health of the test organisms. The laboratory water was also used for culturing the test organisms and as the dilution water when performing GLEC's acute reference toxicant tests. The laboratory control sediment with the Emory River surface water (ERM 9.0) was used to measure the toxicity of the surface water being used as the overlying water in the whole sediment toxicity tests. The partial life cycle *C. dilutus* whole sediment toxicity test control survival, growth (AFDW and biomass), and emergence results are summarized in Tables 18 through 21. Control survival and growth results for the 28-day *H. azteca* whole sediment toxicity tests are provided in Tables 34 and 35.

Partial Life Cycle *Chironomus dilutus*

After 20 days of exposure, the organisms exposed to the Emory River reference control sediment, the laboratory control sediments and the water only control exceeded the minimum survival (70 percent) and growth (0.48 mg AFDW at test termination) criteria for an acceptable control for the *C. dilutus* tests (Tables 18 and 19). The *C. dilutus* exposed for 20 days to the Emory River reference control sediment had 97.9 percent survival, and 95.8 percent of the organisms exposed to the laboratory control sediment with Emory River surface water had survived. The organisms exposed to the laboratory control sediment with laboratory water had

95.8 percent survival, and the water only control had 93.8 percent survival after 20 days of exposure.

The *C. dilutus* exposed to the Emory River reference control sediment, the laboratory control sediment and to the water only control exceeded the minimum partial life cycle survival (≥ 65 percent) and percent emergence (≥ 50%) criteria for acceptable controls (Table 20). The *C. dilutus* exposed to the Emory River reference control sediment had 77.1 percent partial life cycle survival and 77.1 percent emergence. The organisms exposed to the laboratory control sediment with Emory River surface water had 87.5 percent partial life cycle survival and 86.5 percent emergence. The organisms exposed to the laboratory control sediment with laboratory water had 86.5 percent partial life cycle survival and 86.5 percent emergence. The water only control had 86.5 percent partial life cycle survival and 86.5 percent emergence at test termination.

There were no statistically significant differences between *C. dilutus* 20-day survival, growth as AFDW or biomass in the laboratory control sediment with Emory River surface water and the laboratory control sediment with laboratory water (Table 19). The mean 20-day AFDW and 20-day AFDW biomass for *C. dilutus* exposed to the laboratory control sediment with laboratory water was 1.14814 mg and 1.09583 mg, respectively, while the mean AFDW and biomass for *C. dilutus* exposed to the laboratory control sediment with Emory River surface water control was 1.25220 mg and 1.20062 mg, respectively.

When the organisms exposed to the laboratory control sediment with laboratory water were statistically compared to the water only control, there was no statistical difference in survival. However, there was a statistical difference in both AFDW and biomass between the laboratory control sediment with laboratory water control and the water only control. The mean 20-day AFDW and 20-day biomass for *C. dilutus* exposed to the laboratory control sediment with laboratory water was 1.14814 mg and 1.09583 mg, respectively, while the mean AFDW and biomass for *C. dilutus* exposed to the water only control was 0.80229 mg and 0.73521 mg, respectively. These data suggest that the sediment provided an additional food source for the *C. dilutus.*

The test exposure water quality measurements (Tables 23, 24, and 25) were also within the acceptable limits according to the EPA testing protocol (i.e., daily mean temperatures were 23 ± 1 °C; D.O. was maintained above 2.5 mg/L in the overlying water; and there were no variations greater than 50% in overlying water hardness, alkalinity, and ammonia measurements for each test type). Therefore, the *C. dilutus* whole sediment toxicity tests were conducted following the prescribed standard protocols, and are valid assessments of sediment toxicity, with the following exceptions.

The dissolved oxygen concentration fell below 2.5 mg/L, on July 25, 2011, in the following samples:

- Emory Reference control sediment (2.1 mg/L),
- ERM 0.5-10% (2.2mg/L),
- ERM 0.5-100% (2.2 mg/L),

- ERM 1.0-10% (2.4 mg/L),
- ERM 1.0-40% (2.4 mg/L),
- ERM 1.0-100% (2.3 mg/L),
- ERM 3.5-20% (2.2 mg/L),

In response to the drop in DO concentration on July 25, 2011, a third overlying water renewal was added to all of the controls and investigative test sediment replicates. On July 26, 2011 the DO concentration was below 2.5 mg/L in the laboratory control sediment with laboratory water (2.2 mg/L), laboratory control sediment with Emory River water (2.1 mg/L) and in the following investigative sediment sample concentrations:

- ERM 0.5-10% (2.3 mg/L),
- ERM 0.5-40% (2.1-2.2 mg/L),
- ERM 0.5-60% (2.2 mg/L),
- ERM 1.0-10% (2.2 mg/L),
- ERM 1.0-20% (2.1-2.2 mg/L),
- ERM 1.0-60% (2.2-2.3 mg/L).

In response, a fourth overlying water renewal was added to all of the controls and to all treatments of the investigative sediment sample replicates.

On July 27, 2011 the DO concentration was below 2.5 mg/L in the laboratory control sediment with Emory River water (2.1-2.2 mg/L), Emory Reference control sediment (2.3 mg/L) and in the investigative sediment sample concentrations ERM 0.5-10% (2.1 mg/L) and ERM 3.5-10% (2.2 mg/L).

The EPA manual recommends that if increasing the overlying water renewals does not increase the DO concentration in the test chambers, then feeding may be suspended for the time necessary to increase DO concentrations (see EPA /600/R-99/064 manual, section 15.3.7.1). Therefore, in addition to the four overlying water renewals, feeding to all test treatments and controls was suspended on July 27 and July 28, 2011 (laboratory control sediment with laboratory water DO measurements were 2.0-2.3 mg/L). On July 29, 2011 after approval from Rick Sherrard of TVA, feeding was reinitiated to all test treatment and controls, at a rate of 1.0 mL of 4.0 g/L Tetrafin slurry per replicate. The reduced feeding rate was thought to help sustain the DO measurements above 2.5 mg/L during the period of increased renewals. If the DO measurements fell below 2.5 mg/L despite the four water renewals, feeding was suspended. Once the DO concentration was greater than 2.5 mg/L feeding was reinitiated at the reduced rate of 1.0 mL per replicate.

On July 30, 2011 the DO concentrations fell below 2.5 mg/L in the laboratory control sediment with laboratory water (2.2 mg/L) and in the laboratory control sediment with Emory River water (2.2-2.3 mg/L). In response, feeding was suspended and four water renewals continued.

The fourth renewal was discontinued on July 31, 2011 because the DO concentrations increased above 3.0 mg/L in all controls and in the investigative sediment sample replicates. DO

concentrations fell below 2.5 mg/L on August 2, 2011 in the laboratory control sediment with laboratory water (1.5-1.6 mg/L), laboratory control sediment with Emory River water (2.0 mg/L) and in the following investigative sediment sample concentrations:

- ERM 0.5-10% (1.7 mg/L),
- ERM 0.5-20% (2.0-2.4 mg/L),
- ERM 0.5-40% (2.2-2.4 mg/L
- ERM 1.0-10% (2.1 mg/L),
- ERM 1.0-20% (2.4 mg/L),
- ERM 1.0-40% (1.7 mg/L),
- ERM 1.0-60% (2.3 mg/L).

In response, overlying water renewals were increased to four times per day and feeding was suspended in all the controls and investigative test sediment replicates. On August 3, 2011 feeding was reinitiated because DO concentrations were greater than 2.5 mg/L. On August 6 and August 8, 2011, feeding was suspended because DO measurements were below 2.5 mg/L in the laboratory control sediment with laboratory water (2.0 and 2.4 mg/L), laboratory control sediment with Emory River water (1.5-2.0 and 2.2-2.4 mg/L) and in the Emory Reference control sediment (2.4 mg/L).

On August 17, 2011, the fourth overlying water renewal was suspended and feeding was increased to the recommended rate of 1.5 ml of 4.0 g/L Tetrafin slurry to all controls and test treatments due to DO concentrations greater than 3.0 mg/L. The third water renewal was discontinued on August 20, 2011 because the DO concentrations increased above 3.0 mg/L in all controls and investigative sediment sample replicates.

On August 27, 2011 all controls and investigative sediment sample replicates were mistakenly fed 1.0 mL of 20 g/L Tetrafin slurry, due to a technician error. On August 28, 2011, low dissolved oxygen levels were observed for some of the test concentrations. After review of the laboratory bench sheets, it was discovered the culture food of 20 g/L Tetrafin slurry was used to feed the definitive *C. dilutus* tests (on August 27, 2011), rather than the 4 g/L Tetrafin slurry food.

On Sunday, August 28, 2011 the dissolved oxygen in the following test concentrations for the definitive *C. dilutus* sediment toxicity test fell below 2.5 mg/L:

- Laboratory control sediment with Emory River water (1.4-2.1 mg/L)
- ERM 0.5-80% (1.3-2.5 mg/L)
- ERM 0.5-100% (1.5-1.9 mg/L)
- ERM 1.0-40% (1.9 mg/L)
- ERM 2.5-10% (2.4 mg/L)
- ERM 2.5-20% (2.2-2.3 mg/L)
- ERM 2.5-40% (2.4 mg/L)
- ERM 3.5-10% (2.2 mg/L)

- ERM 3.5-20% (2.4mg/L)

In response to the low DO readings, a third overlying water renewal was initiated on August 28, 2011. It is most likely that the renewal on August 28, 2011 prevented any long term effect on the survival rates or emergence of the *C. dilutus*. Rick Sherrard was notified August 29, 2011 via phone and with a memo detailing these events.

On August 30, 2011, four water renewals were initiated due to DO concentration readings of 1.6 mg/L in the laboratory control sediment with Emory River water. DO concentrations below 2.5 mg/L persisted on August 31 and September 01, 2011 in the laboratory control sediment with Emory River water (1.9 mg/L and 1.0 mg/L, respectively) and therefore feeding was suspended to all controls and investigative sediment sample replicates. On September 02, 2011 the fourth water renewal was discontinued and feeding was reinitiated after DO concentrations increased to greater than 2.5 mg/L. The third water renewals were discontinued to all control and investigative sediment sample replicates on September 03, 2011 because DO concentrations were greater than 2.5 mg/L.

Based on previous studies, these brief reductions in test chamber DO values were unlikely to have affected the test results (see EPA /600/R-99/064 manual, section 15.3.8.2.3).

All test chambers were observed daily to assess organism behavior. No unusual observations were noted with the test organisms in these sediment samples.

Statistical Analysis for Partial Life Cycle *Chironomus dilutus* Tests

The statistical results for the *C. dilutus* survival and growth whole sediment toxicity tests are provided in Appendix D. *C. dilutus* partial life cycle and percent emergence statistical data are provided in Appendix E.

Investigative Sediment Sample ERM 0.5:

After 20 days of exposure, *C. dilutus* survival and growth results from the six test concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of ERM 0.5 sediment (GLEC Number: 8982) were compared statistically to the Emory River reference control sediment sample (GLEC Number: 8981). There was no statistically significant reduction ($p \geq 0.05$) in *C. dilutus* survival. However, there was a significant reduction in both growth [measured as AFDW of surviving organisms (mg)], and biomass [AFDW of surviving organisms divided by the initial number of organisms minus pupae and emerged adults (mg)] after 20 days of exposure relative to the Emory River reference control sediment (Tables 2 and 3). The No-Observed-Effect Concentration (NOEC), Lowest-Observed-Effect-Concentration (LOEC), and the IC_{25} (Inhibition Concentration at 25%) estimates for the 20-day *C. dilutus* growth as AFDW were 60 percent, 80 percent and 83.2 percent of ERM 0.5 sediment, respectively. The NOEC, LOEC, and IC_{25} estimates for the 20-day *C. dilutus* growth as biomass were 80 percent, 100 percent and 82.8 percent of sediment, respectively (Table 22).

The ERM 0.5 sediment also showed a significant difference in the *C. dilutus* partial life cycle survival and percent emergence when compared to the Emory River reference control sediment (Table 4). The NOEC for the *C. dilutus* partial life cycle survival and percent emergence was 80 percent and 60 percent of ERM 0.5 sediment, respectively (Table 22). The LOEC for the *C. dilutus* partial life cycle survival and percent emergence were 100 and 80 percent sediment, respectively. The IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence were 70.6 and 64.2 percent ERM 0.5 sediment, respectively (Table 22).

The total cumulative percent emergence data for all of the treatments of investigative ERM 0.5 are summarized in Table 5.

Investigative Sediment Sample ERM 1.0:

C. dilutus survival (20-day) and growth (20-day) results from the six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of ERM 1.0 sediment (GLEC Number: 8984) were compared statistically to the Emory River reference control sediment sample (GLEC Number: 8981). There were no statistically significant reductions ($p \geq 0.05$) in *C. dilutus* survival, after 20 days of exposure relative to the Emory River reference control sediment. However, after 20-days of exposure, both growth as AFDW and growth as biomass were significantly reduced when compared statistically to the Emory River reference control sediment sample (Tables 6 and 7). The NOEC estimates for the 20-day *C. dilutus* growth as AFDW and growth as biomass were both 60 percent of sediment ERM 1.0. The LOEC estimates for the 20-day *C. dilutus* growth as AFDW and growth as biomass were both 80 percent sediment ERM 1.0. The 20-day IC_{25} estimates for growth as AFDW and growth as biomass were 90.3 and 84.9 percent of ERM 1.0 sediment, respectively (Table 22).

At test termination the ERM 1.0 sediment also showed a significant reduction in partial life cycle survival and percent emergence (Table 8). The NOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both 60 percent ERM 1.0 sediment (Table 22). The LOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both 80 percent sediment (Table 22). The IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence were 66.6 and 65.4 percent ERM 1.0 sediment, respectively (Table 22).

The total cumulative percent emergence data for all of the treatments of investigative sample ERM 1.0 are summarized in Table 9.

Investigative Sediment Sample ERM 2.5:

C. dilutus 20-day survival and growth results from the Emory River reference control sediment sample (GLEC Number: 8981) were compared statistically to the six test concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of ERM 2.5 sediment (GLEC Number: 8985). There was a significant reduction ($p < 0.05$) in *C. dilutus* survival, growth as AFDW and growth as biomass, after 20 days of exposure relative to the Emory River reference control sediment (Tables 10 and 11). The NOEC estimate for the 20-day *C. dilutus* survival was 80 percent and the LOEC for survival was 100 percent ERM 2.5 sediment. The IC_{25} for the 20-day survival was 86.8 percent

ERM 2.5 sediment. The NOEC and LOEC estimates for both growth as AFDW and growth as biomass after 20-days were 10 and 20 percent of investigative sample ERM 2.5, respectively. The IC_{25} estimates for growth and biomass were 43.9 and 40.5 percent sediment, respectively (Table 22).

At test termination the ERM 2.5 sediment also a showed significant reduction in partial life cycle survival and percent emergence (Table 12). The NOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both 40 percent sediment (Table 22). The LOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both 60 percent ERM 2.5 sediment. The IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence were 46.0 and 45.4 percent ERM 2.5 sediment, respectively (Table 22).

The total cumulative percent emergence data for all of the treatments of investigative sample ERM 2.5 are summarized in Table 13.

Investigative Sediment Sample ERM 3.5:

After 20 days of exposure, *C. dilutus* survival and growth results from the Emory River reference control sediment sample (GLEC Number: 8981) were compared statistically to the six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of ERM 3.5 sediment (GLEC Number: 8987). There was no significant reduction ($p \geq 0.05$) in *C. dilutus* survival after 20 days of exposure relative to the Emory River reference control sediment with the exception of the 80 percent treatment which was significantly lower that the control (Tables 14 and 15). The response at 80 percent ERM 3.5 sediment only suggests that a type I error of the null hypothesis occurred. The NOEC estimates for the 20-day *C. dilutus* survival was 100 percent ERM 3.5 sediment. Both the LOEC and the IC_{25} estimates for survival were greater than 100 percent sediment (Table 22).

In contrast, the *C. dilutus* growth as AFDW and growth as biomass in the surviving organisms of the ERM 3.5 sediment was significantly reduced when compared to the Emory River reference control sediment (Table 15). The NOEC for *C. dilutus* growth as AFDW and growth as biomass were both 40 percent ERM 3.5 sediment. The LOEC estimates for both growth as AFDW and growth as biomass were 60 percent sediment. The IC_{25} estimates for *C. dilutus* growth as AFDW and growth as biomass after 20-days of exposure to sediment ERM 3.5 were 46.9 and 49.9 percent, respectively (Table 22).

At test termination the ERM 3.5 sediment also a showed significant reduction in partial life cycle survival and percent emergence (Table 16). The NOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both 40 percent ERM 3.5 sediment, and the LOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both 60 percent ERM 3.5 sediment (Table 22). The IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence were 48.5 and 46.9 percent ERM 3.5 sediment, respectively (Table 22).

The total cumulative percent emergence data for all of the treatments of ERM 3.5 are summarized in Table 17.

28-Day *Hyalella azteca*

The *H. azteca* in the 28-day Emory River reference control sediment, the laboratory control sediment and in the water only exposure control exceeded the minimum survival criterion (80 percent), and in each case there was measurable growth relative to the weight of organisms at test initiation (Tables 34 and 35). After 28 days of exposure, the *H. azteca* exposed to the Emory River reference control sediment had 95.0 percent survival and organisms exposed to the laboratory control sediment with Emory River surface water had 97.5 percent survival. The organisms exposed to the laboratory control sediment with laboratory water had 97.5 percent survival, and 93.8 percent of the water only control organisms survived. .

There was no statistical difference ($p \geq 0.05$) between *H. azteca* survival, growth as average dry weight or growth as biomass in the laboratory control sediment with Emory River surface water relative to the laboratory control sediment with laboratory water (Table 35). Survival of organisms exposed to the laboratory control sediment with laboratory water, when statistically compared to the water only control, showed no difference in survival. However there was a significant difference between organisms exposed to sediment and those exposed to water only in both growth as average dry weight and growth as biomass. The mean growth as average dry weight and growth as biomass for *H. azteca* exposed to the laboratory control sediment with laboratory water were 0.56363 mg and 0.54850 mg, respectively. In contrast, the mean growth as average dry weight and growth as biomass for *H. azteca* exposed to water only control were 0.31780 mg and 0.29388 mg, respectively. These data suggest that the sediment provided an additional food source for the *H. azteca.*

The test exposure water quality measurements (Tables 37, 38, and 39) were also within the acceptable limits according to the EPA testing protocol (i.e., daily mean temperatures were 23 ± 1 °C; D.O. was maintained above 2.5 mg/L in the overlying water; and there were no variations greater than 50% in overlying water hardness, alkalinity or ammonia measurements for each test type (Appendix C)). Consequently, the *H. azteca* whole sediment toxicity tests with samples Emory River reference, ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5 are valid assessments of sediment toxicity with the following exception. On August 01, 2011 (test day 20), test temperatures in the overlying water exceeded 24.0°C in the following test treatments: Laboratory control sediment with Emory river water (24.3°C), Emory reference control sediment (24.1°C), investigative sediment ERM 1.0 at test concentrations of 10%, 20%, and 60% (all 24.1°C), sediment ERM 1.0 test concentration 40% (24.1 and 24.2°C), and sediment ERM 2.5 at test concentration 60% (24.1°C). The temperature control system was adjusted and the test temperatures were measured and recorded later in the day to verify the temperature of the overlying water was below 24.0°C (see Appendix C).

All test chambers were checked daily to assess organism behavior and no unusual observations were noted.

Statistical Analysis for 28-Day *Hyalella azteca* Tests

The statistical results for survival and growth in the *H. azteca* whole sediment toxicity tests are provided in Appendix F.

Investigative Sediment Sample ERM 1.0:

Survival and growth results from the 28-day *H. azteca* whole sediment toxicity tests were conducted with six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of ERM 1.0 sediment (GLEC Number: 8984) and were statistically compared to the Emory River reference sediment sample (GLEC Number: 8981). There was no statistically significant reduction ($p \geq 0.05$) in *H. azteca* survival in any the six sediment concentrations after 28 days of exposure relative to the Emory River reference control sediment (Table 26 and 27). The NOEC for survival was 100 percent ERM 1.0 sediment. The LOEC and IC_{25} estimates for *H. azteca* survival were >100 percent ERM 1.0 sediment (Table 36).

In contrast, *H. azteca* growth (measured as average dry weight in mg) in the surviving organisms of the ERM 1.0 sediment was significantly reduced when compared to the Emory River reference control sediment (Tables 27 and 36). The NOEC for *H. azteca* growth as average dry weight was 60 percent, and the LOEC was 80 percent of ERM 1.0 sediment sample. The IC_{25} estimate for growth as average dry weight was 88.0 percent sediment (Table 36).

The *H. azteca* growth data was also evaluated using biomass. A significant reduction in *H. azteca* biomass in investigative sample ERM 1.0 was found when compared to the Emory River reference control sediment (Tables 27 and 36). The NOEC and LOEC for *H. azteca* biomass was 60 and 80 percent of sediment ERM 1.0, respectively, and the IC_{25} estimate for *H. azteca* biomass was 77.1 percent sediment (Table 36).

Investigative Sediment Sample ERM 2.5:

After 28 days of exposure, the *H. azteca s*urvival and growth results from the six concentrations (10%, 20%, 40%, 60%, 80%, 100%) of ERM 2.5 sediment (GLEC Number: 8985) were statistically compared to the Emory River reference sediment sample (GLEC Number: 8981). There was a significant reduction ($p < 0.05$) in *H. azteca* survival, growth as average dry weight and growth as biomass in the six sediment concentrations after 28 days of exposure when compared to the Emory River reference control sediment (Tables 28 and 29). The NOEC and LOEC for *H. azteca* survival was 80 and 100 percent ERM 2.5 sediment, respectively, and the IC_{25} estimate for *H. azteca* survival was 84.9 percent sediment (Table 36).

Both *H. azteca* growth as average dry weight and growth as biomass in the organisms of the ERM 2.5 sediment were significantly reduced relative to the Emory River reference control sediment (Tables 29 and 36). The NOEC and LOEC estimates for the 28-day *H. azteca* growth as average dry weight and growth as biomass were <10 percent and 10 percent ERM 2.5 sediment, respectively. In addition, the IC_{25} estimates for growth as average dry weight and growth as biomass were 19.5 and 42.7 percent ERM 2.5 sediment, respectively.

Investigative Sediment Sample ERM 3.5:

H. azteca 28-day whole sediment toxicity test survival and growth results for six test concentrations (10%, 20%, 40%, 60%, 80%, 100%) of ERM 3.5 sediment (GLEC Number: 8987) were statistically compared to the Emory River reference sediment sample (GLEC Number: 8981). There was a significant reduction ($p < 0.05$) in *H. azteca* survival, growth as average dry weight and growth as biomass in the six sediment concentrations after 28 days of exposure relative to the Emory River reference control sediment (Tables 30 and 31). The NOEC and LOEC for *H. azteca* survival was 80 and 100 percent ERM 3.5 sediment, respectively, and the IC_{25} estimate for *H. azteca* survival was 91.9 percent sediment (Table 36).

In addition, both *H. azteca* growth as average dry weight and growth as biomass in the organisms of the ERM 3.5 sediment were significantly reduced relative to the Emory River reference control sediment (Tables 31 and 36). The NOEC and LOEC estimates for the 28-day *H. azteca* growth as average dry weight and growth as biomass were 20 percent and 40 percent ERM 3.5 sediment, respectively. In addition, the IC_{25} estimates for growth as average dry weight and growth as biomass were 41.6 and 37.8 percent ERM 3.5 sediment, respectively.

Investigative Sediment Sample ERM 5.5:

The survival and growth results from the *H. azteca* 28-day whole sediment toxicity test conducted with six test concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of ERM 5.5 (GLEC Number: 8989) were statistically compared to the Emory River reference sediment sample (GLEC Number: 8981). There was no significant reduction ($p \geq 0.05$) in *H. azteca* survival in any of the six sediment concentrations after 28 days of exposure relative to the Emory River reference control sediment (Tables 32 and 33). The NOEC for *H. azteca* survival was 100 percent sediment and the LOEC and IC_{25} estimate for survival were greater than 100 percent sediment (Table 36).

However, both *H. azteca* growth as average dry weight and growth as biomass in the organisms of the ERM 5.5 sediment were significantly reduced relative to the Emory River reference control sediment (Tables 33 and 36). The NOEC and LOEC estimates for the 28-day *H. azteca* growth as average dry weight and growth as biomass were 20 percent and 40 percent ERM 5.5 sediment, respectively. In addition, the IC_{25} estimates for growth as average dry weight and growth as biomass were 88.7 and 86.0 percent ERM 5.5 sediment, respectively.

In-House Reference Toxicant Results for *Chironomus dilutus* and *Hyalella azteca*

The 96-hour LC_{50} values for in-house NaCl reference toxicant tests were 7.46 mg/L for *C. dilutus* and 4.71 mg/L for *H. azteca* conducted during this time period. Those 96-hour LC_{50} values were within ± 2 standard deviations of GLEC's in house mean reference toxicant LC_{50} values. The summarized control charts are provided in Appendix G. At test termination, there was 100 percent survival of the control organisms in both the *C. dilutus* and *H. azteca* reference toxicant tests.

SUMMARY

In summary, all the control samples for the *C. dilutus* whole sediment toxicity tests met the performance criteria, as outlined in EPA /600/R-99/064 manual, for the 20-day survival, 20-day growth as AFDW, and 20-day growth as biomass, and for the test termination endpoints of partial life cycle percent survival and percent emergence.

C. dilutus 20-day survival was not significantly ($p \geq 0.05$) in three of the four sediment samples (ERM 0.5, ERM 1.0, and ERM 3.5). Survival was significantly reduced in the ERM 2.5 sediment in the 100 percent survival. *C. dilutus* growth was significantly reduced (measured as a reduction in AFDW and biomass) in at least one test concentration in each of the four samples analyzed. Sediment sample ERM 2.5 demonstrated the greatest effect on *C. dilutus* growth relative to the other three investigative samples. All four investigative sediment samples; ERM 0.5, ERM 1.0, ERM 2.5, and ERM 3.5 showed a statistically significant effect on *C. dilutus* partial life cycle survival and percent emergence relative to the Emory River reference sediment control in at least one test concentration (Table 22).

The 28-day *H. azteca* survival and growth endpoints for all the control samples also met the required performance criteria for the whole sediment toxicity tests. The 28-day *H. azteca* survival in 100 percent sediment was reduced in two of the four investigative samples (ERM 2.5 and ERM 3.5) when compared to the Emory River reference control sediment. Sediment samples ERM 1.0 and ERM 5.5 did not have an effect on *H. azteca* survival at any test concentration. All four investigative sediment samples (ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5) reduced growth (expressed as average dry weight or biomass) of the test organisms at one or more test concentrations relative to the Emory River reference control sediment organisms. The most toxic sediment sample appeared to be ERM 2.5, which demonstrated reductions in growth at all six test concentrations (Table 36).

If you have any questions, or if you would like additional information, please contact myself, Mick DeGraeve, or Dennis McCauley at (231) 941-2230. Thank you for the opportunity to provide this service to the Tennessee Valley Authority. We look forward to continuing to provide environmental services to you in the future.

Sincerely,

Mailee W. Garton
Laboratory Coordinator

Mick DeGraeve
Director of Strategic Planning
and Program Development

MWG:mg

TABLE 1. **Summary of Randomly Selected Replicates used to Evaluate 20-Day Survival, Growth (as average Ash-Free-Dry-Weight (AFDW)), and Biomass (AFDW) Endpoints for the Tennessee Valley Authority (TVA) Emory River *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Replicate Number											
Sample ID-Test Sediment Concentration	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
GLW				T		T			T		T	
LCS + GLW			T			T				T	T	
LCS +ERW	T	T		T						T		
ERS + ERW					T		T		T			T
ERM 0.5-10%			T		T	T				T		
ERM 0.5-20%		T	T			T				T		
ERM 0.5-40%	T					T					T	T
ERM 0.5-60%	T	T		T				T				
ERM 0.5-80%		T				T		T				T
ERM 0.5-100%	T	T							T			T
ERM 1.0-10%			T	T				T	T		T	
ERM 1.0-20%		T	T	T							T	
ERM 1.0-40%		T	T						T		T	
ERM 1.0-60%	T				T			T		T		
ERM 1.0-80%	T		T				T	T				
ERM 1.0-100%				T			T	T	T			
ERM 2.5-10%						T			T		T	T
ERM 2.5-20%		T	T							T		T
ERM 2.5-40%	T				T	T						T
ERM 2.5-60%	T						T		T			T
ERM 2.5-80%	T				T	T	T					
ERM 2.5-100%					T		T		T			T
ERM 3.5-10%	T					T	T		T			
ERM 3.5-20%	T			T	T		T					
ERM 3.5-40%			T		T		T	T				
ERM 3.5-60%				T			T			T	T	
ERM 3.5-80%					T			T		T	T	
ERM 3.5-100%	T			T				T	T			

T**:** Randomly selected replicate used for 20-day growth and survival determinations.

Note: All remaining replicates not denoted with a "T" were used for emergence determinations

TABLE 2. **Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 0.5 (GLC# 8982) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints for the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)	**Emory River Reference Control (ERS+ERW)**	**ERM 0.5-10%**	**ERM 0.5-20%**	**ERM 0.5-40%**	**ERM 0.5-60%**	**ERM 0.5-80%**	**ERM 0.5-100%**
Random Replicate Numbers: Refer to Table 1.	12	11	12	12	12	12	12	12
	11	12	12	11	11	11	12	12
	12	12	12	12	12	12	12	12
	11	12	9	11	12	11	11	9
20-Day Percent Survival	**95.8**	**97.9**	**93.8**	**95.8**	**97.9**	**95.8**	**97.9**	**93.8**

[r] Replicates initiated with 12 organisms each

TABLE 3. **Comparison of Average[1] Ash-Free-Dry Weight (AFDW) (mg), Biomass[2] (AFDW) (mg), and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 0.5 (GLC# 8982) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints for the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 0.5-10%		ERM 0.5-20%		ERM 0.5-40%		ERM 0.5-60%		ERM 0.5-80%		ERM 0.5-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
Random Replicate Numbers: Refer to Table 1.	1.52333	1.52333	1.32636	1.21583	1.23083	1.23083	1.21909	1.21909	1.20667	1.20667	1.41700	1.41700	0.98917	0.98917	0.83667	0.83667
	1.25818	1.15333	1.26417	1.26417	1.28091	1.28091	0.84111	0.75700	1.41100	1.28273	1.12545	1.03167	1.11450	1.11455	0.78500	0.78500
	1.01000	1.01000	1.35167	1.35167	1.44750	1.44750	1.24364	1.24364	1.43250	1.43250	0.99083	0.99083	1.17000	1.17000	0.81417	0.81417
	1.21727	1.11583	1.41083	1.41083	1.39143	0.97400	1.24000	1.10222	1.14700	1.14700	0.81900	0.74455	0.88636	0.81250	0.80571	0.56400
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.25220**		**1.33826**		**1.33767**		**1.13596**[a]		**1.29929**		**1.08807**		**1.04001**[a]		**0.81039**[a]	
Average (AFDW) Biomass[2] Weight (mg)		**1.20062**		**1.31063**		**1.23331**		**1.08049**		**1.26723**		**1.04601**		**1.02156**		**0.74996**[a]
20-Day Percent Survival	**95.8**		**97.9**		**93.8**		**95.8**		**97.9**		**95.8**		**97.9**		**93.8**	

[1] Average Ash-Free-Dry-Weight (AFDW) is the total ash-free-dry weight of surviving organisms

[2] Biomass weight is the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and emerged adults

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test day 10 = 0.21100mg

TABLE 4. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 0.5 (GLC# 8982) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 0.5-10%		ERM 0.5-20%		ERM 0.5-40%		ERM 0.5-60%		ERM 0.5-80%		ERM 0.5-100%	
	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment
Random Replicate Numbers: Refer to Table 1.	12	0	9	0	12	0	8	0	12	0	7	1	7	0	8	0
	10	0	12	0	9	0	10	0	6	0	8	0	8	0	7	0
	8	0	10	0	11	0	8	0	6	0	8	0	6	0	6	0
	10	0	8	0	9	0	10	1	10	0	9	0	7	0	6	0
	12	0	6	0	11	0	11	0	12	0	8	0	8	0	3	0
	10	0	11	0	9	0	10	0	8	0	7	1	4	1	5	0
	9	1	10	0	12	0	9	1	9	0	7	0	7	5	8	0
	12	0	8	0	11	0	10	0	8	0	8	0	2	0	3	0
Partial Life Cycle[1] Survival (%)	**87.5**		**77.1**		**87.5**		**81.3**		**74.0**		**66.7**		**57.3**		**47.9** [a]	
Percent Emergence[2] (%)	**86.5**		**77.1**		**87.5**		**79.2**		**74.0**		**64.6**		**51.0** [a]		**47.9** [a]	
Average Time (Days) to First Emergence	**26**		**24**		**23**		**22**		**21**		**23**		**25**		**28**	

[1] Total number of alive emerged plus total number alive found in the sediment at test termination, divided by the number of organisms at test initiation.

[2] Total number of alive emerged divided by the number of organisms at test initiation.

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

TABLE 5. Summary of the Total Percent Cumulative Emergence Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 0.5 (GLC# 8982) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 0.5-10%**	**ERM 0.5-20%**	**ERM 0.5-40%**	**ERM 0.5-60%**	**ERM 0.5-80%**	**ERM 0.5-100%**
8/2/2011	18	0	0	0	0	0	0	0	0
8/3/2011	19	0	0	0	2	1	0	0	0
8/4/2011	20	0	0	3	5	3	1	2	1
8/5/2011	21	0	2	4	9	3	4	4	1
8/6/2011	22	0	6	7	10	8	5	4	1
8/7/2011	23	1	7	12	12	11	7	4	2
8/8/2011	24	3	12	17	19	12	8	6	2
8/9/2011	25	7	18	24	21	17	11	8	2
8/10/2011	26	9	21	31	21	21	13	8	3
8/11/2011	27	10	25	36	23	22	17	11	6
8/12/2011	28	22	35	39	29	28	18	14	8
8/13/2011	29	26	38	40	32	30	19	14	10
8/14/2011	30	29	40	42	34	33	20	16	12
8/15/2011	31	29	42	44	36	36	22	18	14
8/16/2011	32	31	45	50	39	40	23	19	16
8/17/2011	33	34	47	54	44	40	26	21	16
8/18/2011	34	39	49	58	45	43	31	25	18
8/19/2011	35	43	57	67	52	48	32	26	19
8/20/2011	36	47	57	68	55	51	37	27	22
8/21/2011	37	52	58	70	57	53	39	28	24
8/22/2011	38	56	61	74	59	56	43	31	26
8/23/2011	39	57	62	74	62	58	43	31	28
8/24/2011	40	60	62	76	65	58	43	33	30
8/25/2011	41	62	64	77	70	59	46	38	34
8/26/2011	42	66	71	81	71	65	50	40	35
8/27/2011	43	68	71	81	72	67	51	40	38
8/28/2011	44	69	71	81	72	67	51	41	40
8/29/2011	45	72	72	82	73	69	57	42	41
8/30/2011	46	74	74	83	73	71	58	45	42
8/31/2011	47	76	74	84	73	71	58	45	42
9/1/2011	48	80	74	84	74	71	59	46	44
9/2/2011	49	82	74	84	74	71	61	46	44
9/3/2011	50	82	74	84	74	71	61	46	44
9/4/2011	51	83	74	84	76	71	62	47	45
9/5/2011	52	83	74	84	76	71	62	47	45
9/6/2011	53	83	74	84	76	71	62	47	45
9/7/2011	54	83	74	84	76	71	62	49	46
9/8/2011	55	83	74	84	76	71	62	49	46
9/9/2011	56	83	74	84	76	71	62	49	46
9/10/2011	57	83	74	84	76	71	62	49	46
9/11/2011	58	83	74	84	76	71	62	49	46
9/12/2011	59	83	74	84	76	71	62	49	46
9/13/2011	60	83	74	84	76	71	62	49	46
9/14/2011	60	83	74	84	76	71	62	49	46
Total Number of Emerged		83	74	84	76	71	62	49	46
Total Percent Cumulative Emergence[1]		86.5	77.1	87.5	79.2	74.0	64.6	51.0	47.9

Note: Each test concentration was initiated with 96 organisms; 12 organisms per replicate.

[1] Total Percent Cumulative Emergence is the total number of emerged divided by the number of organisms used to initiate each concentration.

TABLE 6. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 1.0 (GLC# 8984) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints for the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)	**Emory River Reference Control (ERS+ERW)**	**ERM 1.0-10%**	**ERM 1.0-20%**	**ERM 1.0-40%**	**ERM 1.0-60%**	**ERM 1.0-80%**	**ERM 1.0-100%**
Random Replicate Numbers: Refer to Table 1.	12	11	10	11	12	8	12	12
	11	12	12	12	12	12	12	12
	12	12	11	12	12	12	11	11
	11	12	11	12	12	11	12	9
			12 *					
20-Day Percent Survival	**95.8**	**97.9**	**93.3**	**97.9**	**100.0**	**89.6**	**97.9**	**91.7**

[r] Replicates initiated with 12 organisms each

* Technician error; 5 replicates terminated on Day 20 instead of 4.

TABLE 7. **Comparison of Average[1] Ash-Free-Dry Weight (AFDW) (mg), Biomass[2] (AFDW) (mg), and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 1.0 (GLC# 8984) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 1.0-10%*		ERM 1.0-20%		ERM 1.0-40%		ERM 1.0-60%		ERM 1.0-80%		ERM 1.0-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
Random Replicate Numbers: Refer to Table 1.	1.52333	1.52333	1.32636	1.21583	1.34000	1.11667	1.19100	1.08273	1.13667	1.13667	1.30714	0.83182	1.05000	1.05000	1.02000	1.02000
	1.25818	1.15333	1.26417	1.26417	1.22750	1.22750	1.37750	1.37750	1.20750	1.20750	1.22333	1.22333	0.85583	0.85583	0.88083	0.88083
	1.01000	1.01000	1.35167	1.35167	1.40800	1.28000	1.37091	1.37091	1.37200	1.37200	1.19583	1.19583	1.03364	0.94750	1.10455	1.01250
	1.21727	1.11583	1.41083	1.41083	1.38909	1.27333	1.16333	1.16333	1.21500	1.21500	1.44000	1.29600	1.18917	1.18917	0.90111	0.67583
					1.15750	1.15750										
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.25220**		**1.33826**		**1.30442**		**1.27569**		**1.23279**		**1.29158**		**1.03216**[a]		**0.97662**[a]	
Average (AFDW) Biomass[2] Weight (mg)		**1.20062**		**1.31063**		**1.21100**		**1.24862**		**1.23279**		**1.13675**		**1.01063**[a]		**0.89729**[a]
20-Day Percent Survival	**95.8**		**97.9**		**93.3**		**97.9**		**100.0**		**89.6**		**97.9**		**91.7**	

[1] Average Ash-Free-Dry-Weight (AFDW) is the total ash-free-dry weight of surviving organisms

[2] Biomass weight is the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and emerged adults

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test day 10 = 0.21100mg

* Technician error; 5 replicates terminated on Day 20 instead of 4.

TABLE 8. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 1.0 (GLC# 8984) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 1.0-10%*		ERM 1.0-20%		ERM 1.0-40%		ERM 1.0-60%		ERM 1.0-80%		ERM 1.0-100%	
	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment
Random Replicate Numbers: Refer to Table 1.	12	0	9	0	8	0	9	0	8	0	7	0	5	0	6	0
	10	0	12	0	10	0	10	0	8	0	7	1	4	0	8	0
	8	0	10	0	10	0	10	0	8	0	6	0	5	0	3	0
	10	0	8	0	10	0	8	0	8	0	7	0	4	0	5	0
	12	0	6	0	9	0	7	0	11	0	8	0	8	0	5	0
	10	0	11	0	11	0	9	1	9	0	10	0	3	0	3	0
	9	1	10	0	9	0	8	0	8	0	9	0	3	0	3	0
	12	0	8	0			10	0	9	0	9	1	7	0	4	0
Partial Life Cycle[1] Survival (%)	**87.5**		**77.1**		**79.8**		**75.0**		**71.9**		**67.7**		**40.6** [a]		**38.5** [a]	
Percent Emergence[2] (%)	**86.5**		**77.1**		**79.8**		**74.0**		**71.9**		**65.6**		**40.6** [a]		**38.5** [a]	
Average Time (Days) to First Emergence	**26**		**24**		**21**		**22**		**23**		**25**		**25**		**27**	

[1] Total number of alive emerged plus total number alive found in the sediment at test termination, divided by the number of organisms at test initiation.

[2] Total number of alive emerged divided by the number of organisms at test initiation.

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

* Technician error; 5 replicates terminated on Day 20 instead of 4; therefore, there are 7 replicates rather than 8.

TABLE 9. Summary of the Total Percent Cumulative Emergence Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 1.0 (GLC# 8984) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 1.0-10%**	**ERM 1.0-20%**	**ERM 1.0-40%**	**ERM 1.0-60%**	**ERM 1.0-80%**	**ERM 1.0-100%**
8/2/2011	18	0	0	0	0	0	0	0	0
8/3/2011	19	0	0	1	0	0	0	0	0
8/4/2011	20	0	0	3	0	4	1	1	0
8/5/2011	21	0	2	12	5	5	2	1	0
8/6/2011	22	0	6	14	9	6	4	2	1
8/7/2011	23	1	7	14	14	6	6	4	2
8/8/2011	24	3	12	16	18	10	8	8	2
8/9/2011	25	7	18	19	21	12	9	8	3
8/10/2011	26	9	21	21	25	14	9	9	7
8/11/2011	27	10	25	24	29	19	9	9	7
8/12/2011	28	22	35	27	33	24	17	12	9
8/13/2011	29	26	38	34	38	24	21	14	9
8/14/2011	30	29	40	37	43	26	23	15	11
8/15/2011	31	29	42	42	45	29	25	17	12
8/16/2011	32	31	45	44	46	30	33	20	13
8/17/2011	33	34	47	45	46	33	39	21	14
8/18/2011	34	39	49	46	51	39	44	23	16
8/19/2011	35	43	57	51	57	43	48	30	19
8/20/2011	36	47	57	55	61	49	54	30	22
8/21/2011	37	52	58	59	62	53	57	31	24
8/22/2011	38	56	61	62	64	56	59	31	25
8/23/2011	39	57	62	63	64	58	60	32	27
8/24/2011	40	60	62	63	65	58	60	32	28
8/25/2011	41	62	64	63	68	60	60	32	28
8/26/2011	42	66	71	64	70	62	60	32	29
8/27/2011	43	68	71	64	70	64	60	32	29
8/28/2011	44	69	71	64	70	66	60	32	29
8/29/2011	45	72	72	65	71	68	60	33	32
8/30/2011	46	74	74	67	71	68	60	34	33
8/31/2011	47	76	74	67	71	69	61	37	36
9/1/2011	48	80	74	67	71	69	61	38	36
9/2/2011	49	82	74	67	71	69	61	39	36
9/3/2011	50	82	74	67	71	69	61	39	37
9/4/2011	51	83	74	67	71	69	63	39	37
9/5/2011	52	83	74	67	71	69	63	39	37
9/6/2011	53	83	74	67	71	69	63	39	37
9/7/2011	54	83	74	67	71	69	63	39	37
9/8/2011	55	83	74	67	71	69	63	39	37
9/9/2011	56	83	74	67	71	69	63	39	37
9/10/2011	57	83	74	67	71	69	63	39	37
9/11/2011	58	83	74	67	71	69	63	39	37
9/12/2011	59	83	74	67	71	69	63	39	37
9/13/2011	60	83	74	67	71	69	63	39	37
9/14/2011	61	83	74	67	71	69	63	39	37
Total Number of Emerged		83	74	67	71	69	63	39	37
Total Percent Cumulative Emergence[1]		86.5	77.1	69.8	74.0	71.9	65.6	40.6	38.5

Note: Each test concentration was initiated with 96 organisms; 12 organisms per replicate.

[1] Total Percent Cumulative Emergence is the total number of emerged divided by the number of organisms used to initiate each concentration.

TABLE 10. **Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 2.5 (GLC# 8985) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)	**Emory River Reference Control (ERS+ERW)**	**ERM 2.5-10%**	**ERM 2.5-20%**	**ERM 2.5-40%**	**ERM 2.5-60%**	**ERM 2.5-80%**	**ERM 2.5-100%**
Random Replicate Numbers: Refer to Table 1.	12	11	11	11	12	12	9	8
	11	12	11	11	12	11	10	5
	12	12	11	12	11	12	12	5
	11	12	11	12	10	11	10	6
20-Day Percent Survival	**95.8**	**97.9**	**91.7**	**95.8**	**93.8**	**95.8**	**85.4**	**50.0** [a]

[r] Replicates initiated with 12 organisms each

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

TABLE 11. **Comparison of Average[1] Ash-Free-Dry Weight (AFDW) (mg), Biomass[2] (AFDW) (mg), and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 2.5 (GLC# 8985) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 2.5-10%		ERM 2.5-20%		ERM 2.5-40%		ERM 2.5-60%		ERM 2.5-80%		ERM 2.5-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
Random Replicate Numbers: Refer to Table 1.	1.52333	1.52333	1.32636	1.21583	1.38700	1.26091	1.27091	1.16500	1.09917	1.09917	0.82417	0.82417	0.76778	0.57583	0.68000	0.45333
	1.25818	1.15333	1.26417	1.26417	1.36636	1.25250	1.16273	1.06583	0.98750	0.98750	0.77727	0.71250	0.70400	0.58667	0.91800	0.38250
	1.01000	1.01000	1.35167	1.35167	1.20375	1.07000	1.00750	1.00750	1.06900	0.97182	0.71833	0.71833	0.59167	0.59167	0.96250	0.35000
	1.21727	1.11583	1.41083	1.41083	1.45400	1.32182	1.14750	1.14750	1.09667	0.89727	0.82545	0.75667	0.59200	0.49333	1.00500	0.50250
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.25220**		**1.33826**		**1.35278**		**1.14716**[a]		**1.06309**[a]		**0.78631**[a]		**0.66386**[a]		**0.89138**[a]	
Average (AFDW) Biomass[2] Weight (mg)		**1.20062**		**1.31063**		**1.22631**		**1.09646**[a]		**0.98894**[a]		**0.75292**[a]		**0.56188**[a]		**0.42208**[a]
20-Day Percent Survival	**95.8**		**97.9**		**91.7**		**95.8**		**93.8**		**95.8**		**85.4**		**50.0**[a]	

[1] Average Ash-Free-Dry-Weight (AFDW) is the total ash-free-dry weight of surviving organisms

[2] Biomass weight is the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and emerged adults

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test day 10 = 0.21100mg

TABLE 12. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 2.5 (GLC# 8985) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 2.5-10%		ERM 2.5-20%		ERM 2.5-40%		ERM 2.5-60%		ERM 2.5-80%		ERM 2.5-100%	
	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment
Random Replicate Numbers: Refer to Table 1.	12	0	9	0	8	0	10	0	6	0	7	0	2	0	4	0
	10	0	12	0	8	2	7	0	8	1	3	0	5	0	2	0
	8	0	10	0	9	0	9	0	10	0	8	0	1	0	1	0
	10	0	8	0	8	0	9	0	11	0	3	0	5	0	6	0
	12	0	6	0	8	0	7	0	9	0	3	0	3	0	1	0
	10	0	11	0	11	0	9	0	6	0	4	0	0	0	2	0
	9	1	10	0	9	0	5	0	5	1	3	0	5	0	4	0
	12	0	8	0	7	2	5	0	8	0	7	0	2	0	1	0
Partial Life Cycle[1] Survival (%)	**87.5**		**77.1**		**75.0**		**63.5**		**67.7**		**39.6**[a]		**24.0**[a]		**21.9**[a]	
Percent Emergence[2] (%)	**86.5**		**77.1**		**70.8**		**63.5**		**65.6**		**39.6**[a]		**24.0**[a]		**21.9**[a]	
Average Time (Days) to First Emergence	**26**		**24**		**23**		**22**		**25**		**29**		**32**		**31**	

[1] Total number of alive emerged plus total number alive found in the sediment at test termination, divided by the number of organisms at test initiation.

[2] Total number of alive emerged divided by the number of organisms at test initiation.

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

TABLE 13. Summary of the Total Percent Cumulative Emergence Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 2.5 (GLC# 8985) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 2.5-10%**	**ERM 2.5-20%**	**ERM 2.5-40%**	**ERM 2.5-60%**	**ERM 2.5-80%**	**ERM 2.5-100%**
8/2/2011	18	0	0	0	0	0	0	0	0
8/3/2011	19	0	0	0	0	0	0	0	0
8/4/2011	20	0	0	2	3	1	0	0	0
8/5/2011	21	0	2	5	4	1	1	0	0
8/6/2011	22	0	6	6	5	2	1	0	0
8/7/2011	23	1	7	8	5	2	1	0	0
8/8/2011	24	3	12	10	8	4	2	0	0
8/9/2011	25	7	18	11	12	4	2	1	0
8/10/2011	26	9	21	17	12	7	3	1	1
8/11/2011	27	10	25	20	12	8	4	1	2
8/12/2011	28	22	35	25	17	18	4	3	4
8/13/2011	29	26	38	28	19	18	4	5	5
8/14/2011	30	29	40	31	23	19	4	5	5
8/15/2011	31	29	42	33	24	22	5	5	7
8/16/2011	32	31	45	34	26	23	6	5	7
8/17/2011	33	34	47	36	29	24	7	5	7
8/18/2011	34	39	49	39	33	27	9	8	8
8/19/2011	35	43	57	44	38	35	13	9	10
8/20/2011	36	47	57	47	40	35	16	9	11
8/21/2011	37	52	58	51	40	35	17	9	13
8/22/2011	38	56	61	53	43	38	19	11	18
8/23/2011	39	57	62	57	46	40	20	12	18
8/24/2011	40	60	62	60	47	46	22	14	18
8/25/2011	41	62	64	60	50	49	22	17	19
8/26/2011	42	66	71	63	51	51	26	20	21
8/27/2011	43	68	71	64	51	51	30	20	21
8/28/2011	44	69	71	65	54	54	35	22	21
8/29/2011	45	72	72	67	59	57	36	22	21
8/30/2011	46	74	74	68	59	58	36	22	21
8/31/2011	47	76	74	68	59	58	37	23	21
9/1/2011	48	80	74	68	59	59	37	23	21
9/2/2011	49	82	74	68	59	61	37	23	21
9/3/2011	50	82	74	68	61	61	38	23	21
9/4/2011	51	83	74	68	61	63	38	23	21
9/5/2011	52	83	74	68	61	63	38	23	21
9/6/2011	53	83	74	68	61	63	38	23	21
9/7/2011	54	83	74	68	61	63	38	23	21
9/8/2011	55	83	74	68	61	63	38	23	21
9/9/2011	56	83	74	68	61	63	38	23	21
9/10/2011	57	83	74	68	61	63	38	23	21
9/11/2011	58	83	74	68	61	63	38	23	21
9/12/2011	59	83	74	68	61	63	38	23	21
9/13/2011	60	83	74	68	61	63	38	23	21
9/14/2011	61	83	74	68	61	63	38	23	21
Total Number of Emerged		83	74	68	61	63	38	23	21
Total Percent Cumulative Emergence[1]		86.5	77.1	70.8	63.5	65.6	39.6	24.0	21.9

Note: Each test concentration was initiated with 96 organisms; 12 organisms per replicate.

[1] Total Percent Cumulative Emergence is the total number of emerged divided by the number of organisms used to initiate each concentration.

TABLE 14. **Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 3.5 (GLC# 8987) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)	**Emory River Reference Control (ERS+ERW)**	**ERM 3.5-10%**	**ERM 3.5-20%**	**ERM 3.5-40%**	**ERM 3.5-60%**	**ERM 3.5-80%**	**ERM 3.5-100%**
Random Replicate Numbers: Refer to Table 1.	12	11	8	12	12	12	10	10
	11	12	9	12	12	11	10	11
	12	12	12	11	12	10	10	11
	11	12	12	12	12	10	10	12
20-Day Percent Survival	**95.8**	**97.9**	**85.4**	**97.9**	**100.0**	**89.6**	**83.3**[a]	**91.7**

[r] Replicates initiated with 12 organisms each

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

TABLE 15. **Comparison of Average[1] Ash-Free-Dry Weight (AFDW) (mg), Biomass[2] (AFDW) (mg), and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 3.5 (GLC# 8987) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 3.5-10%		ERM 3.5-20%		ERM 3.5-40%		ERM 3.5-60%		ERM 3.5-80%		ERM 3.5-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
Random Replicate Numbers: Refer to Table 1.	1.52333	1.52333	1.32636	1.21583	1.99429	1.26909	1.02250	1.02250	1.17167	1.17167	0.84083	0.84083	0.72100	0.60083	0.74100	0.61750
	1.25818	1.15333	1.26417	1.26417	1.48143	1.03700	1.11273	1.11273	0.90833	0.90833	0.86000	0.78833	0.69500	0.57917	0.55727	0.51083
	1.01000	1.01000	1.35167	1.35167	1.30750	1.30750	0.96545	0.88500	1.15455	1.15455	0.92200	0.76833	0.62100	0.51750	0.70727	0.64833
	1.21727	1.11583	1.41083	1.41083	1.20727	1.20727	1.32909	1.32909	1.25417	1.25417	1.24000	1.03333	1.00200	0.83500	0.67417	0.67417
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.25220**		**1.33826**		**1.49762**		**1.10744**		**1.12218**		**0.96571**[a]		**0.75975**[a]		**0.66993**[a]	
Average (AFDW) Biomass[2] Weight (mg)		**1.20062**		**1.31063**		**1.20522**		**1.08733**		**1.12218**		**0.85771**[a]		**0.63313**[a]		**0.61271**[a]
20-Day Percent Survival	**95.8**		**97.9**		**85.4**		**97.9**		**100.0**		**89.6**		**83.3**[a]		**91.7**	

[1] Average Ash-Free-Dry-Weight (AFDW) is the total ash-free-dry weight of surviving organisms

[2] Biomass weight is the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and emerged adults

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test day 10 = 0.21100mg

TABLE 16. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 3.5 (GLC# 8987) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 3.5-10%		ERM 3.5-20%		ERM 3.5-40%		ERM 3.5-60%		ERM 3.5-80%		ERM 3.5-100%	
	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment
Random Replicate Numbers: Refer to Table 1.	12	0	9	0	10	0	9	0	6	0	10	0	3	0	5	0
	10	0	12	0	10	0	7	0	10	0	7	1	3	0	7	0
	8	0	10	0	9	0	8	0	10	0	5	0	4	0	5	0
	10	0	8	0	9	0	7	0	8	0	5	0	6	1	3	0
	12	0	6	0	8	0	10	0	7	0	3	0	7	1	1	0
	10	0	11	0	9	0	8	0	7	0	6	0	3	0	1	0
	9	1	10	0	8	0	9	0	6	0	4	2	6	0	2	0
	12	0	8	0	10	0	8	0	7	0	5	0	6	0	1	0
Partial Life Cycle[1] Survival (%)	**87.5**		**77.1**		**76.0**		**68.8**		**63.5**		**50.0** [a]		**41.7** [a]		**26.0** [a]	
Percent Emergence[2] (%)	**86.5**		**77.1**		**76.0**		**68.8**		**63.5**		**46.9** [a]		**39.6** [a]		**26.0** [a]	
Average Time (Days) to First Emergence	**26**		**24**		**21**		**22**		**24**		**29**		**27**		**33**	

[1] Total number of alive emerged plus total number alive found in the sediment at test termination, divided by the number of organisms at test initiation.

[2] Total number of alive emerged divided by the number of organisms at test initiation.

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

TABLE 17. Summary of the Total Percent Cumulative Emergence Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 3.5 (GLC# 8987) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 3.5-10%**	**ERM 3.5-20%**	**ERM 3.5-40%**	**ERM 3.5-60%**	**ERM 3.5-80%**	**ERM 3.5-100%**
8/2/2011	18	0	0	0	0	0	0	0	0
8/3/2011	19	0	0	5	3	0	0	0	0
8/4/2011	20	0	0	6	4	1	0	0	0
8/5/2011	21	0	2	9	4	3	0	2	0
8/6/2011	22	0	6	11	6	3	0	2	1
8/7/2011	23	1	7	15	8	4	0	2	1
8/8/2011	24	3	12	17	15	5	0	4	1
8/9/2011	25	7	18	23	15	9	1	5	2
8/10/2011	26	9	21	25	17	9	1	7	3
8/11/2011	27	10	25	32	19	13	4	7	4
8/12/2011	28	22	35	36	21	18	6	9	4
8/13/2011	29	26	38	38	22	19	7	9	4
8/14/2011	30	29	40	42	25	20	9	9	4
8/15/2011	31	29	42	44	29	23	13	10	6
8/16/2011	32	31	45	47	32	24	14	10	6
8/17/2011	33	34	47	48	34	24	17	11	7
8/18/2011	34	39	49	51	39	27	19	15	9
8/19/2011	35	43	57	55	44	28	19	16	10
8/20/2011	36	47	57	59	46	34	26	20	12
8/21/2011	37	52	58	63	48	42	27	25	13
8/22/2011	38	56	61	65	50	43	31	25	16
8/23/2011	39	57	62	66	51	45	34	26	16
8/24/2011	40	60	62	66	51	45	35	27	16
8/25/2011	41	62	64	67	54	46	35	29	18
8/26/2011	42	66	71	70	56	48	39	31	20
8/27/2011	43	68	71	70	57	50	40	33	21
8/28/2011	44	69	71	70	58	50	41	33	23
8/29/2011	45	72	72	71	63	53	43	37	23
8/30/2011	46	74	74	71	64	55	45	37	24
8/31/2011	47	76	74	72	64	57	45	38	25
9/1/2011	48	80	74	72	65	57	45	38	25
9/2/2011	49	82	74	73	65	59	45	38	25
9/3/2011	50	82	74	73	65	61	45	38	25
9/4/2011	51	83	74	73	65	61	45	38	25
9/5/2011	52	83	74	73	65	61	45	38	25
9/6/2011	53	83	74	73	66	61	45	38	25
9/7/2011	54	83	74	73	66	61	45	38	25
9/8/2011	55	83	74	73	66	61	45	38	25
9/9/2011	56	83	74	73	66	61	45	38	25
9/10/2011	57	83	74	73	66	61	45	38	25
9/11/2011	58	83	74	73	66	61	45	38	25
9/12/2011	59	83	74	73	66	61	45	38	25
9/13/2011	60	83	74	73	66	61	45	38	25
9/14/2011	61	83	74	73	66	61	45	38	25
Total Number of Emerged		83	74	73	66	61	45	38	25
Total Percent Cumulative Emergence[1]		86.5	77.1	76.0	68.8	63.5	46.9	39.6	26.0

Note: Each test concentration was initiated with 96 organisms; 12 organisms per replicate.

[1] Total Percent Cumulative Emergence is the total number of emerged divided by the number of organisms used to initiate each concentration.

TABLE 18. **Comparison of Number of Surviving Organisms per Replicate and Percent Survival between the Laboratory Control Sediment with Laboratory Water and the Water Only Control, and between the Laboratory Control Sediment with Laboratory Water and the Laboratory Control Sediment with Emory River Water (ERM 9.0) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]			
	Laboratory Control with Laboratory Water (LCS+GLW)	**Water Only Control (GLW)**	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (GLC# 8981) (ERS+ERW)**
Random Replicate Numbers: Refer to Table 1.	12	12	12	11
	11	9	11	12
	11	12	12	12
	12	12	11	12
20-Day Percent Survival	**95.8**	**93.8**	**95.8**	**97.9**

[r] Replicates initiated with 12 organisms each

TABLE 19. **Comparison of Average[1] Ash-Free-Dry-Weight (AFDW) (mg), Biomass[2] (AFDW) (mg), and Percent Survival Between the Laboratory Control Sediment with Laboratory Water and the Water Only Control, and between the Laboratory Control Sediment with Laboratory Water and the Laboratory Control Sediment with Emory River Water (ERM 9.0) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

	Laboratory Control with Laboratory Water (LCS+GLW)		Water Only Control (GLW)		Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (GLC# 8981) (ERS+ERW)	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
Random Replicate Numbers: Refer to Table 1.	1.08083	1.08083	0.73833	0.73833	1.52333	1.52333	1.32636	1.21583
	1.25182	1.14750	1.07333	0.80500	1.25818	1.15333	1.26417	1.26417
	1.25909	1.15417	0.62167	0.62167	1.01000	1.01000	1.35167	1.35167
	1.00083	1.00083	0.77583	0.77583	1.21727	1.11583	1.41083	1.41083
Average[1] Dry Weight (mg)	**1.14814**		**0.80229** [b]		**1.25220**		**1.33826**	
Average Biomass[2] Weight (mg)		**1.09583**		**0.73521** [b]		**1.20062**		**1.31063**
20-Day Percent Survival	**95.8**		**93.8**		**95.8**		**97.9**	

[1] Average Ash-Free-Dry-Weight (AFDW) is the total ash-free-dry weight of surviving organisms

[2] Biomass weight is the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and emerged adults

[b] Significantly different ($p < 0.05$) from Laboratory Control Sediment and Laboratory Water

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test day 10 = 0.21100mg

TABLE 20. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] between the Laboratory Control Sediment with Laboratory Water and the Water Only Control, and between the Laboratory Control Sediment with Laboratory Water and the Laboratory Control Sediment with Emory River Water (ERM 9.0) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

REPLICATE #	Laboratory Control with Laboratory Water (LCS+GLW)		Water Only Control (GLW)		Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (GLC# 8981) (ERS+ERW)	
	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment	Number Emerged	Number live in Sediment
Random Replicate Numbers: Refer to Table 1.	12	0	10	0	12	0	9	0
	12	0	9	0	10	0	12	0
	9	0	9	0	8	0	10	0
	12	0	12	0	10	0	8	0
	9	0	10	0	12	0	6	0
	11	0	11	0	10	0	11	0
	8	0	11	0	9	1	10	0
	10	0	11	0	12	0	8	0
Partial Life Cycle[1] Survival (%)	86.5		86.5		87.5		77.1	
Percent Emergence[2] (%)	86.5		86.5		86.5		77.1	
Average Time (Days) to First Emergence	26		30		26		24	

[1] Total number of alive emerged plus total number alive found in the sediment at test termination, divided by the number of organisms at test initiation.

[2] Total number of alive emerged divided by the number of organisms at test initation.

TABLE 21. Summary of the Total Percent Cumulative Emergence of the Laboratory Control Sediment with Laboratory Water, Water Only Control, and the Laboratory Control Sediment with Emory River Water (ERM 9.0) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration			
Date of Emergence	**Test Day**	**Laboratory Control with Laboratory Water (LCS+GLW)**	**Water Only Control (GLW)**	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (GLC# 8981) (ERS+ERW)**
8/2/2011	18	0	0	0	0
8/3/2011	19	0	0	0	0
8/4/2011	20	0	0	0	0
8/5/2011	21	1	0	0	2
8/6/2011	22	1	0	0	6
8/7/2011	23	1	0	1	7
8/8/2011	24	2	0	3	12
8/9/2011	25	6	0	7	18
8/10/2011	26	7	2	9	21
8/11/2011	27	10	3	10	25
8/12/2011	28	19	4	22	35
8/13/2011	29	23	6	26	38
8/14/2011	30	24	7	29	40
8/15/2011	31	24	9	29	42
8/16/2011	32	25	11	31	45
8/17/2011	33	28	11	34	47
8/18/2011	34	34	16	39	49
8/19/2011	35	43	21	43	57
8/20/2011	36	49	28	47	57
8/21/2011	37	50	31	52	58
8/22/2011	38	55	31	56	61
8/23/2011	39	61	33	57	62
8/24/2011	40	64	34	60	62
8/25/2011	41	66	38	62	64
8/26/2011	42	70	41	66	71
8/27/2011	43	72	42	68	71
8/28/2011	44	75	46	69	71
8/29/2011	45	76	47	72	72
8/30/2011	46	79	56	74	74
8/31/2011	47	83	60	76	74
9/1/2011	48	83	66	80	74
9/2/2011	49	83	73	82	74
9/3/2011	50	83	76	82	74
9/4/2011	51	83	78	83	74
9/5/2011	52	83	82	83	74
9/6/2011	53	83	82	83	74
9/7/2011	54	83	83	83	74
9/8/2011	55	83	83	83	74
9/9/2011	56	83	83	83	74
9/10/2011	57	83	83	83	74
9/11/2011	58	83	83	83	74
9/12/2011	59	83	83	83	74
9/13/2011	60	83	83	83	74
9/14/2011	61	83	83	83	74
Total Number of Emerged		83	83	83	74
Total Percent Cumulative Emergence[1]		86.5	86.5	86.5	77.1

Note: Each test concentration was initiated with 96 organisms; 12 organisms per replicate.

[1] Total Percent Cumulative Emergence is the total number of emerged divided by the number of organisms used to initiate each concentration.

Table 22. **Summary Estimates of the No-Observed-Effect-Concentration (NOEC), Lowest-Obeserved-Effect-Concentration (LOEC), and IC_{25} for 20-Day Surivival, 20-Day Growth (as average Ash-Free-Dry-Weight (AFDW)), 20-Day Biomass (AFDW), Partial Life Cycle Survival, and Emergence for Investigative Sediment Samples ERM 0.5, ERM 1.0, ERM 2.5, and ERM 3.5 (Test Sediment Concentrations 10%, 20%, 40%, 60%, 80%, and 100%) for the Tennessee Valley Authority (TVA) Emory River *Chironomus dilutus* Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

Sample ID	20-Day Survival (percent sediment)			20-Day Growth (as average AFDW) (percent sediment)			20-Day Biomass (AFDW) (percent sediment)			Partial Life Cycle Survival (percent sediment)			Emergence (percent sediment)		
GLC Number	NOEC	LOEC	IC_{25}	NOEC	LOEC	IC_{25}	NOEC	LOEC	IC_{25}	NOEC	LOEC	IC_{25}	NOEC	LOEC	IC_{25}
ERM 0.5	100	>100	>100	60	80	83.2	80	100	82.8	80	100	70.6	60	80	64.2
GLC #8982															
ERM 1.0	100	>100	>100	60	80	90.3	60	80	84.9	60	80	66.6	60	80	65.4
GLC #8984															
ERM 2.5	80	100	86.8	10	20	43.9	10	20	40.5	40	60	46.0	40	60	45.4
GLC #8985															
ERM 3.5	100	>100	>100	40	60	46.9	40	60	49.9	40	60	48.5	40	60	46.9
GLC #8987															

NOEC: No-Observed-Effect-Concentration
LOEC: Lowest-Observed-Effect-Concentration
IC_{25}: Inhibition Concentration 25%

TABLE 23. **Summary of Mean Water Quality Parameters for Controls of Test Exposure Water Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Emory River *Chironomus dilutus* Partial Life-Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

Sample ID	Temperature (°C) (range)	pH (s.u.) (range)	Dissolved Oxygen (mg/L) (range)	Specific Conductivity (µmhos/cm) (range)	Alkalinity (CaCO3 mg/L) (range)	Hardness (CaCO3 mg/L) (range)	Ammonia (mg/L as N) (range)
Emory River Reference Control (ERS+ERW) (GLC# 8981)	**22.6** (22.0-23.7) n=102	**7.07** (6.80-7.46) n=48	**3.7** (2.1-5.1) n=92	**135** (88-254) n=20	**67** (32-100) n=4	**80** (36-124) n=4	**0.73** (0.08-1.90) n=3
LCS & ERW Laboratory Control Sediment with Emory River Water-ERM 9.0	**22.7** (22.0-23.9) n=112	**7.19** (6.28-7.63) n=52	**2.9** (1.0-5.7) n=104	**169** (108-266) n=22	**63** (40-102) n=4	**73** (52-116) n=4	**0.39** (0.17-0.77) n=4
LCS & GLW Laboratory Control Sediment with Laboratory Water	**22.9** (22.0-23.9) n=104	**7.51** (6.26-7.78) n=48	**3.5** (1.5-6.2) n=98	**311** (276-346) n=20	**116** (106-130) n=3	**133** (120-144) n=3	**0.21** (0.0-0.52) n=3
GLW Laboratory Water Only	**22.9** (22.0-23.9) n=119	**7.65** (7.19-8.12) n=55	**5.5** (2.5-8.2) n=109	**302** (291-306) n=23	**101** (98-106) n=3	**124** (108-136) n=3	**0.10** (0.00-0.15) n=3

TABLE 24. **Summary of Mean Water Quality Parameters for Sediment Samples ERM 0.5 (GLC# 8982) and ERM 1.0 (GLC# 8984) of Test Exposure Water Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Emory River *Chironomus dilutus* Partial Life-Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

Sample ID	Temperature (°C) (range)	pH (s.u.) (range)	Dissolved Oxygen (mg/L) (range)	Specific Conductivity (µmhos/cm) (range)	Alkalinity (CaCO3 mg/L) (range)	Hardness (CaCO3 mg/L) (range)	Ammonia (mg/L as N) (range)
ERM 0.5 10%	**22.9** (22.1-24.0) n=104	**7.15** (6.49-7.60) n=48	**3.7** (1.7-5.5) n=94	**135** (93-258) n=20	**51** (30-102) n=4	**58** (36-116) n=4	**0.48** (0.00-1.78) n=4
ERM 0.5 20%	**22.9** (22.2-23.9) n=112	**7.15** (6.51-7.49) n=52	**3.8** (2.0-5.4) n=102	**146** (90-266) n=22	**58** (32-100) n=3	**68** (36-120) n=3	**0.66** (0.08-1.80) n=3
ERM 0.5 40%	**22.9** (22.2-23.9) n=104	**7.13** (6.42-7.61) n=48	**4.0** (2.1-5.5) n=94	**137** (92-263) n=20	**57** (32-98) n=3	**73** (44-128) n=3	**0.62** (0.00-1.80) n=3
ERM 0.5 60%	**23.0** (22.3-23.9) n=112	**7.19** (6.50-7.58) n=52	**4.2** (2.2-5.8) n=102	**149** (90-262) n=22	**57** (32-100) n=3	**71** (48-116) n=3	**0.32** (0.02-0.90) n=3
ERM 0.5 80%	**23.0** (22.4-23.9) n=119	**7.25** (6.53-7.83) n=55	**4.3** (1.3-6.7) n=109	**155** (96-266) n=23	**63** (34-114) n=3	**71** (44-120) n=3	**0.60** (0.00-1.75) n=3
ERM 0.5 100%	**23.0** (22.3-23.9) n=119	**7.29** (6.62-7.79) n=55	**4.6** (1.5-6.6) n=109	**156** (96-270) n=23	**61** (34-108) n=3	**67** (40-120) n=3	**0.54** (0.00-1.59) n=3
ERM 1.0 10%	**22.9** (22.3-23.8) n=102	**7.08** (6.79-7.58) n=48	**3.7** (2.1-5.1) n=92	**135** (93-262) n=20	**57** (32-100) n=3	**69** (36-128) n=3	**0.69** (0.03-1.98) n=3
ERM 1.0 20%	**22.9** (22.3-23.8) n=102	**7.10** (6.88-7.59) n=48	**3.8** (2.1-5.0) n=92	**136** (91-261) n=20	**56** (30-100) n=3	**65** (36-116) n=3	**0.70** (0.02-2.01) n=3
ERM 1.0 40%	**22.9** (22.2-23.6) n=104	**7.14** (6.85-7.70) n=48	**3.8** (1.7-5.2) n=94	**141** (92-288) n=20	**71** (32-108) n=4	**91** (40-144) n=4	**0.49** (0.00-1.88) n=4
ERM 1.0 60%	**22.9** (22.2-23.6) n=112	**7.21** (6.90-7.66) n=52	**3.8** (2.2-5.2) n=102	**150** (91-272) n=22	**57** (30-98) n=3	**68** (40-120) n=3	**0.59** (0.00-1.71) n=3
ERM 1.0 80%	**22.9** (22.3-23.5) n=109	**7.25** (6.98-7.77) n=49	**4.1** (2.8-6.3) n=99	**148** (92-288) n=21	**59** (32-102) n=3	**71** (40-120) n=3	**0.46** (0.03-1.32) n=3
ERM 1.0 100%	**22.8** (22.3-23.5) n=119	**7.34** (7.04-7.86) n=55	**4.1** (2.3-6.7) n=109	**159** (96-284) n=23	**62** (34-108) n=3	**69** (44-116) n=3	**0.40** (0.00-1.16) n=3

TABLE 25. **Summary of Mean Water Quality Parameters for Sediment Samples ERM 2.5 (GLC# 8985) and ERM 3.5 (GLC# 8987) of Test Exposure Water Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Emory River *Chironomus dilutus* Partial Life-Cycle Whole Sediment Toxicity Tests Conducted July 15-September 14, 2011.**

Sample ID	Temperature (°C) (range)	pH (s.u.) (range)	Dissolved Oxygen (mg/L) (range)	Specific Conductivity (µmhos/cm) (range)	Alkalinity (CaCO3 mg/L) (range)	Hardness (CaCO3 mg/L) (range)	Ammonia (mg/L as N) (range)
ERM 2.5 10%	**22.6** (22.0-23.8) n=102	**7.10** (6.86-7.57) n=48	**3.8** (2.4-5.6) n=92	**135** (88-255) n=20	**58** (32-100) n=3	**68** (36-124) n=3	**0.64** (0.03-1.78) n=3
ERM 2.5 20%	**22.6** (22.0-23.8) n=109	**7.16** (6.87-7.70) n=49	**3.9** (2.2-6.2) n=99	**144** (94-262) n=21	**61** (34-102) n=3	**68** (40-120) n=3	**0.65** (0.01-1.84) n=3
ERM 2.5 40%	**22.7** (22.0-23.8) n=112	**7.26** (6.95-7.63) n=52	**4.2** (2.4-6.1) n=102	**151** (91-276) n=22	**61** (36-102) n=3	**76** (44-132) n=3	**0.57** (0.00-1.64) n=3
ERM 2.5 60%	**22.6** (22.0-23.8) n=109	**7.31** (6.97-7.75) n=49	**4.6** (3.2-6.8) n=99	**149** (94-265) n=21	**62** (36-102) n=3	**71** (44-120) n=3	**0.52** (0.01-1.51) n=3
ERM 2.5 80%	**22.6** (22.1-23.7) n=112	**7.34** (7.02-7.71) n=52	**4.8** (2.9-7.1) n=102	**152** (89-266) n=22	**62** (34-102) n=3	**72** (44-120) n=3	**0.39** (0.00-1.15) n=3
ERM 2.5 100%	**22.6** (22.0-23.8) n=103	**7.36** (7.11-7.78) n=48	**5.1** (3.4-7.5) n=94	**142** (89-266) n=20	**54** (32-100) n=4	**65** (40-124) n=4	**0.26** (0.00-0.98) n=4
ERM 3.5 10%	**23.0** (22.4-23.9) n=108	**7.11** (6.72-7.56) n=50	**3.9** (2.2-5.7) n=98	**148** (94-260) n=22	**60** (34-102) n=3	**69** (44-120) n=3	**0.65** (0.07-1.71) n=3
ERM 3.5 20%	**23.0** (22.4-23.8) n=124	**7.20** (6.86-7.74) n=56	**4.1** (2.2-5.7) n=114	**158** (96-269) n=24	**62** (34-108) n=3	**86** (40-132) n=4	**0.69** (0.07-1.91) n=3
ERM 3.5 40%	**23.0** (22.4-23.8) n=122	**7.25** (6.94-7.68) n=56	**4.4** (3.0-6.0) n=112	**159** (94-264) n=24	**38** (34-42) n=2	**42** (40-44) n=2	**0.62** (0.00-1.81) n=3
ERM 3.5 60%	**23.0** (22.5-23.9) n=102	**7.31** (7.03-7.75) n=48	**4.7** (2.5-6.2) n=92	**143** (91-268) n=20	**59** (34-102) n=3	**73** (44-132) n=3	**0.33** (0.03-1.23) n=4
ERM 3.5 80%	**23.0** (22.4-23.8) n=104	**7.34** (6.93-7.77) n=48	**4.8** (3.0-7.0) n=94	**142** (86-274) n=20	**59** (32-104) n=3	**69** (40-128) n=3	**0.29** (0.00-0.83) n=3
ERM 3.5 100%	**23.0** (22.4-23.8) n=104	**7.32** (7.07-7.74) n=48	**5.0** (3.4-7.5) n=94	**140** (85-267) n=20	**52** (30-100) n=4	**66** (36-128) n=4	**0.23** (0.00-0.45) n=4

TABLE 26. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 1.0 (GLC# 8984) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 1.0-10%**	**ERM 1.0-20%**	**ERM 1.0-40%**	**ERM 1.0-60%**	**ERM 1.0-80%**	**ERM 1.0-100%**
1	9	10	10	10	10	10	10	10
2	10	9	10	10	10	10	8	10
3	10	9	9	8	10	10	10	8
4	10	10	10	10	9	10	10	8
5	9	8	10	10	10	10	10	8
6	10	10	10	10	10	8	7	8
7	10	10	9	10	10	10	8	10
8	10	10	10	8	10	10	10	10
28-Day Percent Survival	**97.5**	**95.0**	**97.5**	**95.0**	**98.8**	**97.5**	**91.3**	**90.0**

[r] Replicates initiated with 10 organisms each

TABLE 27. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 1.0 (GLC# 8984) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.**

REPLICATE #	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 1.0-10%		ERM 1.0-20%		ERM 1.0-40%		ERM 1.0-60%		ERM 1.0-80%		ERM 1.0-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
1	0.55556	0.50000	0.37600	0.37600	0.41500	0.41500	0.37000	0.37000	0.30500	0.30500	0.30100	0.30100	0.29500	0.29500	0.22400	0.22400
2	0.45000	0.45000	0.43556	0.39200	0.41100	0.41100	0.36800	0.36800	0.33000	0.33000	0.26000	0.26000	0.44250	0.35400	0.27100	0.27100
3	0.36300	0.36300	0.39889	0.35900	0.39000	0.35100	0.43750	0.35000	0.27700	0.27700	0.30300	0.30300	0.19000	0.19000	0.26750	0.21400
4	0.52900	0.52900	0.35000	0.35000	0.33700	0.33700	0.41300	0.41300	0.53667	0.48300	0.36100	0.36100	0.26800	0.26800	0.32500	0.26000
5	0.42556	0.38300	0.54250	0.43400	0.32700	0.32700	0.25300	0.25300	0.58000	0.58000	0.35500	0.35500	0.27600	0.27600	0.27250	0.21800
6	0.48200	0.48200	0.39300	0.39300	0.41500	0.41500	0.35900	0.35900	0.31900	0.31900	0.40125	0.32100	0.29571	0.20700	0.36625	0.29300
7	0.49500	0.49500	0.43700	0.43700	0.45222	0.40700	0.36500	0.36500	0.43100	0.43100	0.39000	0.39000	0.35000	0.28000	0.30700	0.30700
8	0.60700	0.60700	0.26100	0.26100	0.38800	0.38800	0.39125	0.31300	0.31700	0.31700	0.38300	0.38300	0.33100	0.33100	0.28300	0.28300
Average[1] Dry Weight (mg)	**0.48839**		**0.39924**		**0.39190**		**0.36959**		**0.38696**		**0.34428**		**0.30603[a]**		**0.28953[a]**	
Average Biomass[2] Weight (mg)		**0.47613**		**0.37525**		**0.38138**		**0.34888**		**0.38025**		**0.33425**		**0.27513[a]**		**0.25875[a]**
28-Day Percent Survival	**97.5**		**95.0**		**97.5**		**95.0**		**98.8**		**97.5**		**91.3**		**90.0**	

[1] Average Dry Weight is the total dry weight of surviving organisms

[2] Biomass weight is the total Dry Weight of surviving organisms divided by the initial number of organisms

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01963 mg

TABLE 28. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 2.5 (GLC# 8985) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 2.5-10%**	**ERM 2.5-20%**	**ERM 2.5-40%**	**ERM 2.5-60%**	**ERM 2.5-80%**	**ERM 2.5-100%**
1	9	10	10	10	10	8	10	6
2	10	9	9	10	10	8	10	6
3	10	9	9	10	10	8	6	3
4	10	10	10	10	9	10	6	3
5	9	8	9	10	9	10	8	7
6	10	10	9	10	10	10	9	2
7	10	10	10	10	10	9	8	1
8	10	10	10	10	10	8	9	6
28-Day Percent Survival	**97.5**	**95.0**	**95.0**	**100.0**	**97.5**	**88.8**	**82.5**	**42.5** [a]

[r] Replicates initiated with 10 organisms each

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

TABLE 29. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 2.5 (GLC# 8985) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.**

REPLICATE #	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 2.5-10%		ERM 2.5-20%		ERM 2.5-40%		ERM 2.5-60%		ERM 2.5-80%		ERM 2.5-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
1	0.55556	0.50000	0.37600	0.37600	0.35400	0.35400	0.29500	0.29500	0.28100	0.28100	0.25500	0.20400	0.18800	0.18800	0.16333	0.09800
2	0.45000	0.45000	0.43556	0.39200	0.29444	0.26500	0.36200	0.36200	0.28600	0.28600	0.22750	0.18200	0.25000	0.25000	0.14500	0.08700
3	0.36300	0.36300	0.39889	0.35900	0.27556	0.24800	0.30900	0.30900	0.23800	0.23800	0.22125	0.17700	0.26833	0.16100	0.15667	0.04700
4	0.52900	0.52900	0.35000	0.35000	0.29800	0.29800	0.29100	0.29100	0.39889	0.35900	0.30100	0.30100	0.34000	0.20400	0.14000	0.04200
5	0.42556	0.38300	0.54250	0.43400	0.36667	0.33000	0.28400	0.28400	0.44667	0.40200	0.25000	0.25000	0.27625	0.22100	0.13143	0.09200
6	0.48200	0.48200	0.39300	0.39300	0.33333	0.30000	0.25200	0.25200	0.21900	0.21900	0.27900	0.27900	0.22000	0.19800	0.24000	0.04800
7	0.49500	0.49500	0.43700	0.43700	0.32700	0.32700	0.29100	0.29100	0.29200	0.29200	0.24667	0.22200	0.22250	0.17800	1.32000	0.13200
8	0.60700	0.60700	0.26100	0.26100	0.30900	0.30900	0.28600	0.28600	0.24300	0.24300	0.24500	0.19600	0.26111	0.23500	0.18833	0.11300
Average[1] Dry Weight (mg)	**0.48839**		**0.39924**		**0.31975**[a]		**0.29625**[a]		**0.30057**		**0.25318**[a]		**0.25327**[a]		**0.31060**[a]	
Average Biomass[2] Weight (mg)		**0.47613**		**0.37525**		**0.30388**[a]		**0.29625**[a]		**0.29000**[a]		**0.22638**[a]		**0.20438**[a]		**0.08238**[a]
28-Day Percent Survival	**97.5**		**95.0**		**95.0**		**100.0**		**97.5**		**88.8**		**82.5**		**42.5**[a]	

[1] Average Dry Weight is the total dry weight of surviving organisms

[2] Biomass weight is the total Dry Weight of surviving organisms divided by the initial number of organisms

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01963 mg

TABLE 30. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 3.5 (GLC# 8987) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 3.5-10%**	**ERM 3.5-20%**	**ERM 3.5-40%**	**ERM 3.5-60%**	**ERM 3.5-80%**	**ERM 3.5-100%**
1	9	10	9	8	10	9	9	5
2	10	9	10	10	10	9	10	6
3	10	9	10	10	10	8	10	6
4	10	10	10	10	10	8	8	5
5	9	8	10	10	9	9	8	6
6	10	10	10	9	9	9	9	7
7	10	10	7	10	8	9	10	7
8	10	10	10	10	6	10	10	5
28-Day Percent Survival	**97.5**	**95.0**	**95.0**	**96.3**	**90.0**	**88.8**	**92.5**	**58.8** [a]

[r] Replicates initiated with 10 organisms each

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

TABLE 31. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 3.5 (GLC# 8987) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.**

REPLICATE #	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 3.5-10%		ERM 3.5-20%		ERM 3.5-40%		ERM 3.5-60%		ERM 3.5-80%		ERM 3.5-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
1	0.55556	0.50000	0.37600	0.37600	0.57222	0.51500	0.33125	0.26500	0.26900	0.26900	0.26889	0.24200	0.23556	0.21200	0.32000	0.16000
2	0.45000	0.45000	0.43556	0.39200	0.41600	0.41600	0.29900	0.29900	0.37000	0.37000	0.21778	0.19600	0.20300	0.20300	0.26000	0.15600
3	0.36300	0.36300	0.39889	0.35900	0.44100	0.44100	0.25200	0.25200	0.35200	0.35200	0.32000	0.25600	0.24900	0.24900	0.25833	0.15500
4	0.52900	0.52900	0.35000	0.35000	0.39900	0.39900	0.27800	0.27800	0.25200	0.25200	0.25375	0.20300	0.28000	0.22400	0.17400	0.08700
5	0.42556	0.38300	0.54250	0.43400	0.32000	0.32000	0.34300	0.34300	0.36000	0.32400	0.22111	0.19900	0.23500	0.18800	0.18000	0.10800
6	0.48200	0.48200	0.39300	0.39300	0.31600	0.31600	0.35444	0.31900	0.29556	0.26600	0.20333	0.18300	0.21444	0.19300	0.27000	0.18900
7	0.49500	0.49500	0.43700	0.43700	0.41857	0.29300	0.41100	0.41100	0.36125	0.28900	0.25222	0.22700	0.21800	0.21800	0.27857	0.19500
8	0.60700	0.60700	0.26100	0.26100	0.34800	0.34800	0.35800	0.35800	0.19167	0.11500	0.09800	0.09800	0.22400	0.22400	0.32600	0.16300
Average[1] Dry Weight (mg)	**0.48839**		**0.39924**		**0.40385**		**0.32834**		**0.30644**[a]		**0.22939**[a]		**0.23238**[a]		**0.25836**[a]	
Average Biomass[2] Weight (mg)		**0.47613**		**0.37525**		**0.38100**		**0.31563**		**0.27963**[a]		**0.20050**[a]		**0.21388**[a]		**0.15163**[a]
28-Day Percent Survival	**97.5**		**95.0**		**95.0**		**96.3**		**90.0**		**88.8**		**92.5**		**58.8**[a]	

[1] Average Dry Weight is the total dry weight of surviving organisms

[2] Biomass weight is the total Dry Weight of surviving organisms divided by the initial number of organisms

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01963 mg

TABLE 32. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 5.5 (GLC# 8989) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (ERS+ERW)**	**ERM 5.5-10%**	**ERM 5.5-20%**	**ERM 5.5-40%**	**ERM 5.5-60%**	**ERM 5.5-80%**	**ERM 5.5-100%**
1	9	10	9	9	10	10	9	10
2	10	9	8	9	10	10	10	8
3	10	9	10	8	10	10	10	8
4	10	10	9	7	9	10	10	10
5	9	8	10	10	10	9	10	10
6	10	10	10	10	9	9	9	10
7	10	10	10	10	10	10	8	10
8	10	10	10	10	10	10	7	10
28-Day Percent Survival	**97.5**	**95.0**	**95.0**	**91.3**	**97.5**	**97.5**	**91.3**	**95.0**

[r] Replicates initiated with 10 organisms each

TABLE 33. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Emory River Reference Control Sediment Sample (GLC# 8981) and Investigative Sediment Sample ERM 5.5 (GLC# 8989) at Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100% for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.**

REPLICATE #	Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (ERS+ERW)		ERM 5.5-10%		ERM 5.5-20%		ERM 5.5-40%		ERM 5.5-60%		ERM 5.5-80%		ERM 5.5-100%	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
1	0.55556	0.50000	0.37600	0.37600	0.34000	0.30600	0.42556	0.38300	0.23200	0.23200	0.29500	0.29500	0.35111	0.31600	0.30600	0.30600
2	0.45000	0.45000	0.43556	0.39200	0.51000	0.40800	0.38444	0.34600	0.34000	0.34000	0.32100	0.32100	0.30400	0.30400	0.35000	0.28000
3	0.36300	0.36300	0.39889	0.35900	0.40000	0.40000	0.50000	0.40000	0.26100	0.26100	0.19800	0.19800	0.29200	0.29200	0.31875	0.25500
4	0.52900	0.52900	0.35000	0.35000	0.33000	0.29700	0.36286	0.25400	0.35222	0.31700	0.26900	0.26900	0.31500	0.31500	0.24900	0.24900
5	0.42556	0.38300	0.54250	0.43400	0.30200	0.30200	0.43000	0.43000	0.32700	0.32700	0.33000	0.29700	0.25900	0.25900	0.21600	0.21600
6	0.48200	0.48200	0.39300	0.39300	0.31500	0.31500	0.31700	0.31700	0.33667	0.30300	0.36222	0.32600	0.29333	0.26400	0.33300	0.33300
7	0.49500	0.49500	0.43700	0.43700	0.44900	0.44900	0.33300	0.33300	0.34100	0.34100	0.33500	0.33500	0.27250	0.21800	0.19900	0.19900
8	0.60700	0.60700	0.26100	0.26100	0.48600	0.48600	0.32600	0.32600	0.31700	0.31700	0.32000	0.32000	0.47857	0.33500	0.29200	0.29200
Average[1] Dry Weight (mg)	**0.48839**		**0.39924**		**0.39150**		**0.38486**		**0.31336**[a]		**0.30378**[a]		**0.32069**[a]		**0.28297**[a]	
Average Biomass[2] Weight (mg)		**0.47613**		**0.37525**		**0.37038**		**0.34863**		**0.30475**[a]		**0.29513**[a]		**0.28788**[a]		**0.26625**[a]
28-Day Percent Survival	**97.5**		**95.0**		**95.0**		**91.3**		**97.5**		**97.5**		**91.3**		**95.0**	

[1] Average Dry Weight is the total dry weight of surviving organisms

[2] Biomass weight is the total Dry Weight of surviving organisms divided by the initial number of organisms

[a] Significantly different ($p < 0.05$) from Emory River Reference Control Sediment (GLC# 8981)

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01963 mg

TABLE 34. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival between the Laboratory Control Sediment with Laboratory Water and the Water Only Control, and between the Laboratory Control Sediment with Laboratory Water and the Laboratory Control Sediment with Emory River Water (ERM 9.0) for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.

	Number Test Organisms Surviving per Replicate[r]			
Replicate Number	**Laboratory Control with Laboratory Water (LCS+GLW)**	**Water Only Control (GLW)**	**Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)**	**Emory River Reference Control (GLC# 8981) (ERS+ERW)**
1	8	10	9	10
2	10	10	10	9
3	10	10	10	9
4	10	7	10	10
5	10	10	9	8
6	10	8	10	10
7	10	10	10	10
8	10	10	10	10
28-Day Percent Survival	**97.5**	**93.8**	**97.5**	**95.0**

[r] Replicates initiated with 10 organisms each

TABLE 35. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Laboratory Control Sediment with Laboratory Water and the Water Only Control, and between the Laboratory Control Sediment with Laboratory Water and the Laboratory Control Sediment with Emory River Water (ERM 9.0) for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.**

REPLICATE #	Laboratory Control with Laboratory Water (LCS+GLW)		Water Only Control (GLW)		Laboratory Control with Emory River Water ERM 9.0 (LCS+ERW)		Emory River Reference Control (GLC# 8981) (ERS+ERW)	
	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)	Average[1] Weight (mg)	Biomass[2] Weight (mg)
1	0.60500	0.48400	0.32900	0.32900	0.55556	0.50000	0.37600	0.37600
2	0.73100	0.73100	0.35000	0.35000	0.45000	0.45000	0.43556	0.39200
3	0.67800	0.67800	0.28200	0.28200	0.36300	0.36300	0.39889	0.35900
4	0.62700	0.62700	0.35286	0.24700	0.52900	0.52900	0.35000	0.35000
5	0.37200	0.37200	0.26500	0.26500	0.42556	0.38300	0.54250	0.43400
6	0.54400	0.54400	0.42750	0.34200	0.48200	0.48200	0.39300	0.39300
7	0.45900	0.45900	0.23300	0.23300	0.49500	0.49500	0.43700	0.43700
8	0.49300	0.49300	0.30300	0.30300	0.60700	0.60700	0.26100	0.26100
Average[1] Dry Weight (mg)	**0.56363**		**0.31780** [b]		**0.48839**		**0.39924** [c]	
Average Biomass[2] Weight (mg)		**0.54850**		**0.29388** [b]		**0.47613**		**0.37525** [c]
28-Day Percent Survival	**97.5**		**93.8**		**97.5**		**95.0**	

[1] Average Dry Weight is the total dry weight of surviving organisms

[2] Biomass weight is the total Dry Weight of surviving organisms divided by the initial number of organisms

[b] Significantly different ($p < 0.05$) from Laboratory Control Sediment and Laboratory Water

[c] Significantly different ($p < 0.05$) from Laboratory Control Sediment and Emory River Water ERM 9.0

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01963 mg

TABLE 36.

Summary Estimates of the No-Observed-Effect-Concentration (NOEC), Lowest-Observed-Effect-Concentration (LOEC), and IC_{25} for Survival, Growth (as average Ash-Free-Dry-Weight (AFDW)) and Biomass (AFDW) for the Emory River Reference Control Sediment Sample and the Investigative Sediment Samples ERM 1.0, ERM 2.5, ERM 3.5, and ERM 5.5 (Test Sediment Concentrations of 10%, 20%, 40%, 60%, 80%, and 100%) for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.

Sample ID	Survival (percent sediment)				Growth (as average AFDW) (percent sediment)				Biomass (AFDW) (percent sediment)		
GLC Number	NOEC	LOEC	IC_{25}		NOEC	LOEC	IC_{25}		NOEC	LOEC	IC_{25}
ERM 1.0	100	>100	>100		60	80	88.0		60	80	77.1
GLC #8984											
ERM 2.5	80	100	84.9		<10	10	19.5		<10	10	42.7
GLC #8985											
ERM 3.5	80	100	91.9		20	40	41.6		20	40	37.8
GLC #8987											
ERM 5.5	100	>100	>100		20	40	88.7		20	40	86.0
GLC #8989											

NOEC: No-Observed-Effect-Concentration
LOEC: Lowest-Observed-Effect-Concentration
IC_{25}: Inhibition Concentration 25%

TABLE 37. Summary of Mean Water Quality Parameters of Overlying Water Samples for all Controls Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Emory River *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.

Sample ID	Temperature (°C) (range)	pH (s.u.) (range)	Dissolved Oxygen (mg/L) (range)	Specific Conductivity (µmhos/cm) (range)	Alkalinity (CaCO3 mg/L) (range)	Hardness (CaCO3 mg/L) (range)	Ammonia (mg/L as N) (range)
Emory River Reference Control (ERS+ERW) (GLC# 8981)	**23.1** (22.1-24.1)	**7.10** (6.93-7.59)	**4.9** (3.8-6.2)	**119** (90-218)	**47** (30-80)	**64** (48-96)	**0.82** (0.04-1.59)
	n=60	n=28	n=30	n=12	n=3	n=3	n=2
LCS & ERW Laboratory Control Sediment with Emory River Water-ERM 9.0	**23.0** (22.0-24.3)	**7.26** (6.98-7.65)	**4.3** (3.2-5.3)	**152** (108-283)	**77** (48-106)	**112** (88-136)	**0.36** (0.05-0.66)
	n=60	n=28	n=30	n=12	n=2	n=2	n=2
LCS & GLW Laboratory Control Sediment with Laboratory Water	**23.1** (22.4-23.7)	**7.73** (7.57-8.05)	**4.7** (3.6-7.1)	**325** (298-359)	**124** (114-134)	**154** (140-168)	**0.30** (0.00-0.59)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
GLW Laboratory Water Only	**23.1** (22.4-23.7)	**7.88** (7.66-8.22)	**6.7** (4.3-8.2)	**301** (285-315)	**105** (104-106)	**136** (136-136)	**0.03 U** (0.01-0.04)
	n=58	n=28	n=32	n=12	n=2	n=2	n=2

U = Below MDL (0.04) (non-detect)

TABLE 38. **Summary of Mean Water Quality Parameters of Overlying Water Samples for Test Sediment Samples ERM 1.0 (GLC# 8984) and ERM 2.5 (GLC# 8985) Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Emory River *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.**

Sample ID	Temperature (°C) (range)	pH (s.u.) (range)	Dissolved Oxygen (mg/L) (range)	Specific Conductivity (µmhos/cm) (range)	Alkalinity (CaCO3 mg/L) (range)	Hardness (CaCO3 mg/L) (range)	Ammonia (mg/L as N) (range)
ERM 1.0 10%	**23.1** (22.1-24.1)	**7.08** (6.83-7.59)	**4.8** (3.8-5.6)	**103** (87-130)	**46** (34-58)	**54** (44-64)	**0.72** (0.03-1.40)
	n=60	n=28	n=30	n=12	n=2	n=2	n=2
ERM 1.0 20%	**23.1** (22.1-24.1)	**7.15** (6.86-7.81)	**5.0** (3.9-6.6)	**115** (92-237)	**30** (28-32)	**52** (44-60)	**0.72** (0.01-1.43)
	n=60	n=28	n=30	n=12	n=2	n=2	n=2
ERM 1.0 40%	**23.1** (22.1-24.2)	**7.20** (6.93-7.63)	**5.2** (4.0-6.5)	**116** (93-293)	**47** (38-56)	**64** (48-80)	**0.97** (0.02-1.45)
	n=60	n=28	n=30	n=12	n=2	n=2	n=3
ERM 1.0 60%	**23.1** (22.1-24.1)	**7.25** (6.94-7.85)	**5.1** (3.8-6.3)	**108** (94-125)	**46** (42-50)	**52** (48-56)	**0.80** (0.01-1.59)
	n=59	n=28	n=30	n=12	n=2	n=2	n=2
ERM 1.0 80%	**23.0** (22.0-23.9)	**7.32** (6.98-7.86)	**5.2** (3.9-6.2)	**111** (97-127)	**47** (42-52)	**56** (56-56)	**0.73** (0.46-1.00)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 1.0 100%	**23.0** (22.0-23.9)	**7.44** (6.97-7.82)	**5.1** (4.0-6.0)	**120** (97-155)	**51** (46-56)	**60** (56-64)	**0.53** (0.02-1.04)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 2.5 10%	**23.0** (22.1-23.8)	**7.21** (7.01-8.07)	**5.0** (3.9-5.7)	**109** (93-148)	**46** (34-58)	**54** (48-60)	**0.69** (0.04-1.34)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 2.5 20%	**23.0** (22.1-24.0)	**7.28** (6.94-7.90)	**5.0** (4.0-6.2)	**111** (94-140)	**47** (38-56)	**52** (48-56)	**0.78** (0.00-1.56)
	n=59	n=28	n=30	n=12	n=2	n=2	n=2
ERM 2.5 40%	**23.0** (22.1-23.9)	**7.32** (6.99-7.96)	**5.2** (3.9-6.3)	**113** (99-135)	**45** (38-52)	**50** (48-52)	**0.81** (0.00-1.61)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 2.5 60%	**23.0** (22.1-24.1)	**7.39** (7.13-7.83)	**5.6** (4.3-6.3)	**114** (100-139)	**48** (40-56)	**58** (56-60)	**0.57** (0.00-1.13)
	n=59	n=28	n=30	n=12	n=2	n=2	n=2
ERM 2.5 80%	**23.0** (22.1-23.9)	**7.47** (7.20-7.71)	**6.1** (4.6-6.9)	**115** (104-162)	**54** (40-62)	**65** (56-72)	**0.58** (0.00-0.89)
	n=58	n=28	n=30	n=12	n=3	n=3	n=3
ERM 2.5 100%	**23.0** (22.1-24.0)	**7.48** (7.25-7.94)	**6.3** (4.6-7.0)	**111** (99-146)	**45** (36-54)	**60** (48-72)	**0.32** (0.00-0.63)
	n=59	n=28	n=32	n=12	n=2	n=2	n=2

TABLE 39. **Summary of Mean Water Quality Parameters of Overlying Water Samples for Test Sediment Samples ERM 3.5 (GLC# 8987) and ERM 5.5 (GLC# 8989) Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Emory River *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted July 12-August 9, 2011.**

Sample ID	Temperature (°C) (range) n=58	pH (s.u.) (range) n=28	Dissolved Oxygen (mg/L) (range) n=30	Specific Conductivity (µmhos/cm) (range) n=12	Alkalinity (CaCO3 mg/L) (range) n=2	Hardness (CaCO3 mg/L) (range) n=2	Ammonia (mg/L as N) (range) n=2
ERM 3.5 10%	**23.1** (22.4-23.7)	**7.24** (6.99-7.88)	**5.0** (3.7-5.9)	**105** (90-141)	**38** (32-44)	**52** (52-52)	**0.69** (0.00-1.38)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 3.5 20%	**23.1** (22.4-23.8)	**7.23** (6.98-7.86)	**5.2** (4.0-6.3)	**103** (92-130)	**38** (36-40)	**50** (44-56)	**0.78** (0.00-1.21)
	n=58	n=28	n=32	n=12	n=2	n=2	n=3
ERM 3.5 40%	**23.1** (22.4-23.8)	**7.31** (7.01-8.00)	**5.5** (4.5-6.5)	**108** (96-135)	**38** (36-40)	**74** (48-100)	**0.54** (0.00-1.07)
	n=58	n=28	n=32	n=12	n=2	n=2	n=2
ERM 3.5 60%	**23.1** (22.5-23.8)	**7.38** (7.04-7.89)	**5.7** (4.7-7.0)	**110** (93-131)	**40** (40-40)	**48** (48-48)	**0.43** (0.00-0.86)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 3.5 80%	**23.1** (22.4-23.8)	**7.41** (7.09-7.62)	**6.1** (5.2-6.7)	**109** (99-120)	**39** (38-40)	**48** (44-52)	**0.32** (0.00-0.63)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 3.5 100%	**23.1** (22.4-23.8)	**7.41** (7.21-7.69)	**6.4** (5.5-7.4)	**105** (98-118)	**38** (36-40)	**54** (52-56)	**0.18** (0.00-0.35)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 5.5 10%	**23.1** (22.6-23.8)	**7.17** (6.80-7.82)	**4.8** (4.0-6.0)	**105** (92-140)	**35** (34-36)	**45** (40-48)	**1.24** (0.00-2.48)
	n=58	n=28	n=32	n=12	n=3	n=3	n=2
ERM 5.5 20%	**23.1** (22.5-23.8)	**7.13** (6.79-7.61)	**5.0** (3.7-6.3)	**102** (90-126)	**35** (34-36)	**40** (32-48)	**1.41** (0.00-2.82)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 5.5 40%	**23.1** (22.4-23.8)	**7.24** (6.80-7.80)	**5.2** (4.3-6.0)	**103** (93-131)	**34** (32-36)	**42** (36-48)	**1.42** (0.00-2.83)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 5.5 60%	**23.1** (22.4-23.9)	**7.31** (6.95-8.04)	**5.4** (4.2-6.4)	**105** (93-134)	**36** (36-36)	**51** (40-60)	**1.24** (0.00-2.47)
	n=58	n=28	n=30	n=12	n=3	n=3	n=2
ERM 5.5 80%	**23.1** (22.4-23.9)	**7.29** (6.92-8.06)	**5.3** (4.1-6.3)	**106** (90-133)	**34** (32-36)	**46** (40-52)	**1.04** (0.00-2.08)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2
ERM 5.5 100%	**23.1** (22.5-23.9)	**7.31** (6.96-7.91)	**5.3** (4.2-5.8)	**106** (90-120)	**33** (32-34)	**48** (40-56)	**1.00** (0.00-1.99)
	n=58	n=28	n=30	n=12	n=2	n=2	n=2

TABLE 40. **Summary of Mean Water Quality Parameters of Waters; ERM 9.0 and GLW (GLEC Laboratory Water) Used for Overlying Water Renewals at the Begining of Each Batch and Near Depletion for the Tennessee Valley Authority (TVA) Emory River Whole Sediment Toxicity Tests Conducted July 12-September 14, 2011.**

Sample ID	**Temperature (°C)** (range) n=175	**pH (s.u.)** (range) n=84	**Dissolved Oxygen (mg/L)** (range) n=175	**Specific Conductivity (µmhos/cm)** (range) n=81	**Alkalinity (CaCO3 mg/L)** (range) n=20	**Hardness (CaCO3 mg/L)** (range) n=20	**Ammonia (mg/L as N)** (range) n=20
Emory River Water-ERM 9.0	**22.9** (21.7-24.6)	**7.74** (6.99-8.35)	**8.3** (5.8-9.5)	**140** (74-264)	**106** (14-106)	**132** (28-140)	**0.11** (0.0-0.70)
GLW GLEC Laboratory Water	**23.0** (22.1-24.3)	**8.08** (7.40-8.63)	**8.1** (6.9-9.0)	**297** (260-310)	**110** (106-114)	**126** (124-128)	**0.02 U** (0.00-0.10)
	n=181	n=70	n=181	n=63	n=2	n=2	n=3

U = Below MDL (0.04) (non-detect)

Appendix A
Chain of Custodies

RECORD COPY

BIOMONITORING CHAIN OF CUSTODY RECORD

COC No. BULKSED-052711-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Dates of Sample Collection: 052311, 052411, 052511

Location: Emory River (ERM0.5, ERM0.8, ERM1.0, ERM2.5, ERM3.0, ERM3.5, ERM4.0, ERM5.5, ERM8.0, ERM10.0)

Collected By: R. Josefczyk/RSI, L. Burton/RSI, D. Mathis/RSI, A. Johnson/RSI, T. Walls/RSI, G. Frye/RSI

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):
FedEx UPS Bus Client (Courier) Access America
Other (specify):_

General Comments:
Homogenized sediment from the Emory River.
Samples are in 5 gallon buckets filled with approximately 3 gallons in each bucket.
"EMORYREFERENCE" is a composite sample of ERM8.0 and ERM10.0.
Logbook:TVA-KIF-NTC-TOX-001,002,004

Field Identification / Sample Description	Grab/ Comp	Collection Date/Time		Number of Containers &	Depth (ft)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
Example: BULKSED-ERM0.0-GLEC-052311	----	Date	Time	----	----	Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSED-ERM0.5-GLEC-052311	C	05/23/2011	0950	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8982	5.7-5.9	DS	10:00	Good
BULKSED-ERM0.8-GLEC-052311	C	05/23/2011	~~1042~~ 1145	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8983	5.1 5.9	DS	10:00	Good
BULKSED-ERM1.0-GLEC-052311	C	05/23/2011	0850	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8984	5.6 5.8	DS	10:00	Good
BULKSED-ERM2.5-GLEC-052311	C	05/23/2011	~~1145~~ 1042	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8985	5.4 5.7	DS	10:00	Good
BULKSED-ERM3.0-GLEC-052411	C	05/24/2011	0813	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8986	5.2 5.7	DS	10:00	Good
BULKSED-ERM3.5-GLEC-052411	C	05/24/2011	1111	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8987	5.0 5.1	DS	10:00	Good
BULKSED-ERM4.0-GLEC-052311	C	05/23/2011	1440	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8988	7.0-7.0	DS	10:00	out of Range
BULKSED-ERM5.5-GLEC-052411	C	05/24/2011	0955	(2) 3 gallon	0.0-0.5	NA	NA	X	NA	8989	6.3-6.7	DS	10:00	out of Range
BULKSED-EMORYREFERENCE-GLEC-052511	C	05/25/2011	0855 ~~0915~~ 1500 052411	(5) 3 gallon	0.0-0.5	NA	NA	X	NA	8981	4.8-5.5	DS	12:00	Good

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/ Affiliation:	Date/Time
Ramona Dobak / RSI	05/31/11 0810 ~~0851 / 05/31/11~~	Jesse Morris / RSI	05/31/11 / 0810
Jesse Morris / RSI	06/02/11 / 1218	[illegible] GLEC	06/03/11 10:00

Associated UPS Tracking #s (if applicable):
TVA custody lock: 0011778. Intact

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-060211-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 06/02/2011

Location: ERM9.0

Collected By: R. Josefczyk (RSI), G. Schwartz (RSI), M. Greer (RSI), R. Vance (RSI), G. Frye (RSI), E. Arnold (RSI), J. Ross (Jacobs) Amber Stojak (Arcadis) A Johnson (RSI) T Walls (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):
FedEx UPS Bus Client Courier
Other (specify): Access America

General Comments:

Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Logbook:
Batch A TVA-KIF-NTC-TOX-004

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
	---	Date	Time	---	---	Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-060211	G	06/02/2011	0911	(50) 10L cubitainers	9.04	NA	NA	X	NA	8980	4.4-8.4	DS	1010	good
														temp outer Ranges 21-50
			rj 060211											

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk/RSI	060211/1100	Jesse Morris/RSI	060211/1100
Jesse Morris/RSI	060211/1218	[illegible] GLEC	06/03/11 1010

Associated UPS Tracking #s (if applicable):
TVA custody lock: 0011778 Intact

GLEC
"Great Lakes Environmental Center"

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-00

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	6/3/11	6/3/11	6/3/11	6/3/11	DS
SAMPLE ID	ERM 9.0 Glac 06/07/11	~~ERM 0.5~~ DS ~~ERM Reference~~	ERM 0.5	ERM 0.8	DS
TYPE (W=water, SED=sediment, M=material)	W	SED	Sed	Sed	DS
COLLECTION (G=grab, C=composite)	G				DS
GLC NUMBER	8980	8981	8982	8983	DS
COLLECTION DATE (Time Interval)	6/2/11 9:11	05/25/11 8:55	05/23/11 9:50	05/23/11 11:45	DS
TEMPERATURE (≤6 degrees Celsius[1])	4.4-8.4 *	4.8-5.5	5.7-5.9	5.1-5.9	DS
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Clear, odorless *SEE TVA log Book new 21 cubes out of temp range				DS

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

GLEC
Great Lakes Environmental Center

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-00

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	6/3/11	6/3/11	6/3/11	DS	
SAMPLE ID	ERM 1.0	2.5 ERM	3.0 ERM		
TYPE (W=water, SED=sediment, M=material)	Sed	Sed	Sed		
COLLECTION (G=grab, C=composite)					
GLC NUMBER	8984	8985	8986		
COLLECTION DATE (Time Interval)	5/23/11 8:50	5/23/11 10:42	5/24/11 8:13		
TEMPERATURE (≤6 degrees Celsius[1])	5.6-5.8	5.4 5.7	5.2 5.7		
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)					

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

GLEC
The Great Lakes Environmental Center

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-00

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	6/3/11	6/3/11	6/3/11	DS	
SAMPLE ID	ERM 3.5	ERM 4.0	ERM 5.5		
TYPE (W=water, SED=sediment, M=material)	Sed	Sed	Sed		
COLLECTION (G=grab, C=composite)					
GLC NUMBER	8987	8988	8989		
COLLECTION DATE (Time Interval)	5/24/11 11:10	5/23/11 1440	5/24/11 9:55		
TEMPERATURE (≤6 degrees Celsius[1])	5.0-5.1	*7.0-7.0	*6.7-6.3		
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)		Out of RANGE TVA contacted *See TVA log book	out of RANGE TVA contacts *See TVA log book		

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

Sample Check-In Discrepancy/Comment Form

Project Name: TVA Emory River
Project Number: 5069-00 GLC Number: 8980
Date: 06/03/11 Date Sampled: 06/02/11
Technician Initials DS
Project Manager: MWO

Discrepancy: Please mark one or more of the following in the box below. Anomalies other than what is listed below can be described in the Comment Section.

Any questions associated with the samples (i.e., damaged containers, improper preservation, unlabeled/illegible sample labels, document discrepancies, insufficient sample volume) must be corrected prior to analysis by contacting the project manager, client and/or state authority. All correspondence shall be documented and discrepancies will be solved as quickly as possible.

Cooler Condition:

- ☐ Samples were not received on wet ice
- ☐ No temperature blank submitted
- ☒ Temperature of samples outside of acceptable range, or samples show evidence of freezing.

Container Label Condition:

- ☐ Not the same ID/info. as on COC
- ☐ Incomplete or missing information: sample ID, collection date/time
- ☐ Other: label smeared, torn, or otherwise illegible

Chain of Custody Discrepancies:

- ☐ No custody seal
- ☐ Custody seal not intact
- ☐ No relinquish signature or name
- ☐ No date/time relinquished
- ☐ No signature
- ☐ Incomplete information

Container Condition:

- ☐ Leaking
- ☐ Broken
- ☐ Loose caps, or without labels

Sample Documentation Discrepancies:

- ☐ Samples not received, but listed on COC
- ☐ Samples received, but not listed on COC
- ☐ Mislabeled toxicology tests, preservatives, etc.
- ☐ Holding time expired
- ☐ Insufficient quantity for analysis

Comments:

2 of 50 2.5 gal cubitainers outside 0-6°C Range
Outside range 6.1-8.4°C - See TVA logbook - MWO

Corrective Actions: *(please use include dates and names when documenting)*
Emailed Rick Sherrard/TVA all samples are being held in the refrigerator. - all cubes and of temp are clearly labeled and kept separate. - will wait for further instruction from Rick. - MWO 6/3/11 E-mail from Rick were approved use of the samples; will note the deviations in report. - MWO 6/3/11

Laboratory Technician Signature: [signature] Date: 6/03/11

Project Manager/Laboratory Supervisor Signature: [signature] Date: 6/3/11

Sample Check-In Discrepancy/Comment Form

Project Name: TVA
Project Number: 5069-00 GLC Number: 8989, 8988
Date: 6/03/11 Date Sampled: 5/23/11 5/29/11
Technician Initials DS
Project Manager: [illegible]

Discrepancy: Please mark one or more of the following in the box below. Anomalies other than what is listed below can be described in the Comment Section.

Any questions associated with the samples (i.e., damaged containers, improper preservation, unlabeled/illegible sample labels, document discrepancies, insufficient sample volume) must be corrected prior to analysis by contacting the project manager, client and/or state authority. All correspondence shall be documented and discrepancies will be solved as quickly as possible.

Cooler Condition:

- ☐ Samples were not received on wet ice
- ☐ No temperature blank submitted
- ☒ Temperature of samples outside of acceptable range, or samples show evidence of freezing.

Container Label Condition:

- ☐ Not the same ID/info. as on COC
- ☐ Incomplete or missing information: sample ID, collection date/time
- ☐ Other: label smeared, torn, or otherwise illegible

Chain of Custody Discrepancies:

- ☐ No custody seal
- ☐ Custody seal not intact
- ☐ No relinquish signature or name
- ☐ No date/time relinquished
- ☐ No signature
- ☐ Incomplete information

Container Condition:

- ☐ Leaking
- ☐ Broken
- ☐ Loose caps, or without labels

Sample Documentation Discrepancies:

- ☐ Samples not received, but listed on COC
- ☐ Samples received, but not listed on COC
- ☐ Mislabeled toxicology tests, preservatives, etc.
- ☐ Holding time expired
- ☐ Insufficient quantity for analysis

Comments:

Both Buckets of 8988, & 8989 (ERM 4.0 & ERM5.5) were out of range 0-6°C
See TVA logbook - [illegible]

Corrective Actions: (*please use include dates and names when documenting*)

Emailed Rick Sherrad @ TVA - all samples are being held in refrigerator until further instruction. 6/3/2011 - [illegible]

Email from Rick; were approved use of samples; will note the deviations in report [illegible] 6/3/11

Laboratory Technician Signature: [illegible] Date: 06/03/11

Project Manager/Laboratory Supervisor Signature: [illegible] Date: 06/03/11

COURIER TRANSPORT DOCUMENTATION

DATE: 06/02/2011

COURIER COMPANY:

Access America Transport

From:	To:
TVA c/o Jesse Morris 189 Lakeshore Drive Harriman, TN 37748 865-685-8364	Dennis McCauley dmccauley@glec.com Great Lakes Environmental Center (GLEC) 739 Hastings St. Traverse City, MI 49686 231.941.2230 Cell 231.649.3740

No. of Items:	Description:
71	50- 2.5-gal cubes of water (in 25 crates) 21- 5-gal buckets of sediment

Shippers Name/Company: Jesse Morris/RSI

Date / Time: 060211/1327

Courier Signature/Company: Robert Hulland Express 1

Date / Time: 6/2/11 13:27

Receipt Signature/Company: [illegible]

Date / Time: 6/3/11 10:00

Corresponding Chains of Custody:

BULKSED-052711-GLEC page 1 of 1	
BULKSW-060211-GLEC page 1 of 1	

TVA custody lock: 0011778

PRO# 785564 Robert Hubbard
Express-1 6-2-11 TRUCK# 21852704

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	6/2/2011	Bill of Lading Number	154055
Customer PO		Carrier Name	ACCESS AMERICA TRANSPORT
	Origin		Destination
From Shipper	Tennessee Valley Authority	To Consignee	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	Street	739 Hastings Street
City-St-Zip	Harriman TN 37748	City-St-Zip	Traverse City MI 49686
Phone	865-207-2335	Phone	231-941-2230
Contact Name	Adam Johnson	Contact Name	Dennis McCauley
Bill Freight to:		Special Instructions	Pickup 6/2 per Jason Brown's instructions, deliver 6/3 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
		Units	25.00	25				Total Wgt	835

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges

PrePaid

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY. THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER

SUBJECT TO SECTION 7 OF THE CONDITIONS. IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) | Emergency Response # | (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		Carrier	
Jesse Morris / RSI		Express 1	
Per	Date	Per	Date
TVA	06/02/11 / 1327	Robert Hubbard	6/2/11 13:27

Glec 10:00

:: Tennessee Valley Authority
189 Lakeshore Drive
Harriman TN 37748

SHIP TO: **Great Lakes Enviromental Center**
739 Hastings Street
Traverse City MI 49686
Contact: **Dennis McCauley** **231-941-2230**

----------FOLD HERE----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
154055				Water Samples	

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-070611-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 07/06/2011

Location: ERM9.0

Collected By: R. Josefczyk (RSI), E. Burton (RSI), M. Greer (RSI), G. Schwartz (RSI), B. Beasley (RSI), J. Morris (RSI), G. Frye (RSI), T. Walls (RSI), A. Johnson (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

TVA-KIF-NTC-TOX-004

Delivered By (Circle One):
FedEx UPS Bus Client Courier

Other (specify):_

General Comments: TVA-KIF-NTC-TOX-004

Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch C Turbidity Range 6.4-9.9 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-070611	G	07/06/2011	0946	(160) 10L cubitainers	9.24	~~[illegible]~~ 070611		X	~~[illegible]~~ 070611	9002	3.8-4.9	DS	8:15	Good

[illegible] 070611

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk / RSI	070611/1335	RSI	070611/1335
RSI	070711/0819	GLEC	07/08/11 8:20

Associated UPS Tracking #s (if applicable): TVA Padlock #0011499 Intact Custody Seals intact DS

COURIER TRANSPORT DOCUMENTATION

DATE: 07/07/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
163	160-2.5 gallon cubitainers of Clinch River Water packaged in 80 plastic "milk crates". Three coolers containing sample jars, COCs, and packaging/shipping materials for GLEC use.

Shippers Name/Company: David Mathis / RSI

Date / Time: 070711 / 0820

Courier Signature/Company: Express 1

Date / Time: 070711 / 0820

Receipt Signature/Company: GLEC Daniel Smith

Date / Time: 7/8/11 8:20

Corresponding Chains of Custody:

BULKSW-070711-GLEC Page 1 of 1	
TVA PADLOCK # 0011499	

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	7/7/2011	**Bill of Lading Number**	156379
Customer PO		**Carrier Name**	ACCESS AMERICA TRANSPORT
	Origin		**Destination**
From Shipper	Tennessee Valley Authority	**To Consignee**	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	**Street**	739 Hastings Street
City-St-Zip	Harriman TN 37748	**City-St-Zip**	Traverse City MI 49686
Phone	865-207-2335	**Phone**	231-941-2230
Contact Name	Adam Johnson	**Contact Name**	Dennis McCauley
Bill Freight to:			

Special Instructions

Pickup 7/7 per Jason Brown's instructions, deliver 7/8 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
		Units	25.00	25				Total Wgt	835

Freight Charges

PrePaid

RECEIVED. SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN). MARKED, CONSIGNED. AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE. OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF. SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY. THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED. DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		**Carrier**	
David Maths/251		Express-2	
Per	**Date**	**Per**	**Date**
	070711/0820		070711/0820

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

DATE RECEIVED	7/8/11			DS	INITIALS
SAMPLE ID	BUR SW-EFM9.0 GRC-M0011				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9002				
COLLECTION DATE (Time Interval)	9:46				
TEMPERATURE (≤6 degrees Celsius[1])	3.8-4.9				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Clear, Good				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

GLC NUMBER					INITIALS
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-071311-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 07/13/2011

Location: ERM9.0

Collected By: E. Burton (RSI), C.L. Jackson (TVA) M. Greer (RSI), R. Josefczyk (RSI), J. Kerr (RSI), T. Walls (RSI), E. Hickey (RSI), J. Morris (RSI), A. Johnson (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

TVA-KIF-NTC-TOX-004

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify):_

General Comments:

Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch D Turbidity Range 8.2-18.5 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-071311	G	07/13/2011	0817	(160) 10L cubitainers	10.00	~~[illegible]~~ 071311		X	~~[illegible]~~ 071311	9009	1.6-4.7	DS	12:30	Good ~~[illegible]~~ DS 7/15

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
[signature] / RSI	071311 / 1255	[signature] RSI	071311 / 1255
[signature] / RSI	071411 / 0620	[signature] GLEC	7/15/11 / 12:30

Associated UPS Tracking #s (if applicable): TVA Padlock #0011852 Intact ~~[illegible]~~ 7/15 DS Custody Seals Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 07/14/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
160	160-2.5 gallon cubitainers of Emory River Water packaged in 80 plastic "milk crates". 1 Data Logger packaged for return delivery. Please return ASAP. Thanks!

Shippers Name/Company: David Mathis / RSI

Date / Time: 071411 / 0950

Courier Signature/Company: Randy McLellan RKI

Date / Time: 7/14/2011 0950

Receipt Signature/Company: [signature] Glec Daniel Smith

Date / Time: 7/15/11 12:00

Corresponding Chains of Custody:

BULKSW-071311-GLEC Page 1 of 1	
TVA PADLOCK # 0011852	

Intact

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	7/14/2011	**Bill of Lading Number**	156666
Customer PO		**Carrier Name**	ACCESS AMERICA TRANSPORT
	Origin		**Destination**
From Shipper	Tennessee Valley Authority	**To Consignee**	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	**Street**	739 Hastings Street
City-St-Zip	Harriman TN 37748	**City-St-Zip**	Traverse City MI 49686
Phone	865-207-2335	**Phone**	231-941-2230
Contact Name	Adam Johnson	**Contact Name**	Dennis McCauley
Bill Freight to:		**Special Instructions**	Pickup 7/14 per Jason Brown's instructions, deliver 7/15 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
		Units	25.00	25				Total Wgt	835

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF. SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges

PrePaid

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER

SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper David Mathis /RSI

Carrier RKI

Per **Date** 071411 / 0950

Per Randy McLellan **Date** 7/14/2011

Glen 7/15/11

Rig

From: Tennessee Valley Authority
189 Lakeshore Drive
Harriman TN 37748

SHIP TO:	**Great Lakes Enviromental Center**	
	739 Hastings Street	
	Traverse City MI 49686	
Contact:	**Dennis McCauley**	**231-941-2230**

----------**FOLD HERE**----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
156666				Water Samples	

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

DATE RECEIVED	7/15/11			DS	INITIALS
SAMPLE ID DS 9/23	~~Bulksw-Glec ERM 9.0 07131~~	Bulksw-Glec ERM 9.0 07131			
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9009				
COLLECTION DATE (Time Interval)	7/13/11 8:17				
TEMPERATURE (≤6 degrees Celsius[1])	1.6-4.7				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Custody Seal & padlock intact				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

GLC NUMBER					INITIALS
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-071811-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 07/18/2011

Location: ERM9.0

Collected By: M. Greer (RSI), E. Hickey (RSI), J. Kerr (RSI), B. Beasley (RSI), G. Frye (RSI), C. L. Jackson (TVA), R. Josefczyk (RSI), A. Johnson (RSI), J. Morris (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):
FedEx UPS Bus Client Courier
Other (specify): Express 1

General Comments:
TVA-KIF-NTC-TOX-004 : Logbook
Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch E Turbidity Range 18.8-26.5 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-071811	G	07/18/2011	1002	(80) 10L cubitainers	9.29			X		9016	1.0-2.4 See TVA log book	NW	0846	Clear pale yellow

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
RSI	071811/1252	RSI	071811/1252
RSI	071911/0714	GLEC	07/20/11 0846

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011911 intact upon arrival; all custody seals intact

COURIER TRANSPORT DOCUMENTATION

DATE: 07/18/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
80	80-2.5 gallon cubitainers of Emory River Water packaged in 40 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 071911 / 0824

Courier Signature/Company: Express-1 Tom Fritherst SLC

Date / Time: 7-19-11 / 0824

Receipt Signature/Company: Marlen W Horton

Date / Time: 7/20/11 0846

Corresponding Chains of Custody:

BULKSW-071811-GLEC Page 1 of 1	
TVA PADLOCK # 0011911 ✓	

intact now
all custody seals
intact.

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	7/19/2011	**Bill of Lading Number**	156667
Customer PO		**Carrier Name**	ACCESS AMERICA TRANSPORT
	Origin		**Destination**
From Shipper	Tennessee Valley Authority	**To Consignee**	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	**Street**	739 Hastings Street
City-St-Zip	Harriman TN 37748	**City-St-Zip**	Traverse City MI 49686
Phone	865-207-2335	**Phone**	231-941-2230
Contact Name	Adam Johnson	**Contact Name**	Dennis McCauley
Bill Freight to:			

Special Instructions

Pickup 7/19 per Jason Brown's instructions, deliver 7/20 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
		Units	25.00	25				Total Wgt	835

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges

PrePaid

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		Carrier	
TVA-RS1		Express. 1	
Per	Date	Per	Date
David Mathis		John Pritchett SLC	7-19-11

m: Tennessee Valley Authority
189 Lakeshore Drive
Harriman TN 37748

SHIP TO:	**Great Lakes Enviromental Center**	
	739 Hastings Street	
	Traverse City MI 49686	
Contact:	**Dennis McCauley**	**231-941-2230**

----------FOLD HERE----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
156667				Water Samples	

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	7/20/11			NMS	
SAMPLE ID	Bulk SW-ERM9.0-GLEC-071811				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9016				
COLLECTION DATE (Time Interval)	7/18/2011 1002				
TEMPERATURE (≤6 degrees Celsius[1])	1.0 - 2.4 - see TVA logbook				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	pale yellow color Clear odorless				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-072011-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 07/20/2011

Location: ERM9.0

Collected By: M. Greer (RSI), E. Hickey (RSI), J. Kerr (RSI), B. Beasley (RSI), G. Frye (RSI), C. L. Jackson (TVA), R. Josefczyk (RSI), A. Johnson (RSI), E. Burton (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):
FedEx UPS Bus Client Courier

Other (specify):_

General Comments: Log book # TVA-KIF-NTC-TOX-004

Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch F Turbidity Range 16.9 – 21.5 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-072011	G	07/20/2011	0911	(80) 10L cubitainers	9.77	~~[illegible]~~ 072011		X	~~[illegible]~~ 072011	9023	2.8-3.9	[illegible]	1237	Pale yellow clear

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
[illegible] / RSI	072011 / 1128	[illegible] RSI	072011 / 1128
[illegible] RSI	072111 / 0711	[illegible] / GLEC	07/21/11 1237

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011889 ✓ intact all custody seals intact

COURIER TRANSPORT DOCUMENTATION

DATE: 07/21/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
80	80-2.5 gallon cubitainers of Emory River Water packaged in 40 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 072111 / 0840

Courier Signature/Company: EXPRESS-1 Roy [illegible]

Date / Time: 072111 / 0840

Receipt Signature/Company: [illegible]

Date / Time: 7/22/11 1237

Corresponding Chains of Custody:

BULKSW-072011-GLEC Page 1 of 1	
TVA PADLOCK # 0011889 ✓ intact	

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

Shipment Date	7/21/2011	Bill of Lading Number	156669
Customer PO		Carrier Name	ACCESS AMERICA TRANSPORT
	Origin		Destination
From Shipper	Tennessee Valley Authority	To Consignee	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	Street	739 Hastings Street
City-St-Zip	Harriman TN 37748	City-St-Zip	Traverse City MI 49686
Phone	865-207-2335	Phone	231-941-2230
Contact Name	Adam Johnson	Contact Name	Dennis McCauley
Bill Freight to:			

Special Instructions

Pickup 7/21 per Jason Brown's instructions, deliver 7/22 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
		Units	25.00	25				Total Wgt	835
								Freight Charges	
								PrePaid	

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY. THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY. THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		Carrier	
TVA-RSI		EXPRESS-1	
Per David Mathis	Date 07/21/11	Per	Date 07-21-11

Sample
CHECK-IN FORM

CLIENT: TVA - Emory River PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

DATE RECEIVED	7/22/11			nur	INITIALS
SAMPLE ID	BULKSW-ERM9.0-GLEC-07.2011				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9023				
COLLECTION DATE (Time Interval)	7/20/11 0911				
TEMPERATURE (≤6 degrees Celsius[1])	2.8-3.9				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	pale yellow Clear				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

GLC NUMBER					INITIALS
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-072711-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 07/27/2011

Location: ERM9.0

Collected By: M. Greer (RSI), R. Josefczyk (RSI), D. Mathis (RSI), C.L. Jackson (TVA), T. Walls (RSI), ~~E. Hickey (RSI), B. Beasley (RSI),~~ S. Bunkley (RSI), A. Johnson (RSI), R. Vance (RSI), Eddie Arnold (RSI), & Josh Kerr (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Express 1

General Comments:
Logbook TVA-KIF-NTC-TOX-004
Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch G Turbidity Range 9.2-15.9 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-072711	G	07/27/2011	0842	(160) 10L cubitainers	9.32	072711		X	072711	9031	3.2-4.9	DS	10:05	Good

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
RSI	072711 / 1432	RSI	072711 / 1432
RSI	072811 / 0717	Glec	07/29/11 / 10:05

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011787 Intact Custody Seals intact

GLEC

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

DATE RECEIVED	~~8~~ 7/29/11			DS	INITIALS
SAMPLE ID	BULRSW-ERM9.0 -GLEC-072711				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9031				
COLLECTION DATE (Time Interval)	7/27/11 8:42				
TEMPERATURE (≤6 degrees Celsius[1])	3.2-4.9				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	clear Odorless				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

GLC NUMBER					INITIALS
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

COURIER TRANSPORT DOCUMENTATION

DATE: 07/28/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
160	160-2.5 gallon cubitainers of Emory River Water packaged in 80 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 072811/0805

Courier Signature/Company: Russell Craven Express-1

Russell CRAVEN

Date / Time: 7/28/11 8:05 AM

Receipt Signature/Company: David Smith Glec David Smith

Date / Time: 7/29/11 10:05

Corresponding Chains of Custody:

BULKSW-072711-GLEC Page 1 of 1	
TVA PADLOCK # 0011787 Intact	

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	7/28/2011	**Bill of Lading Number**	157236
Customer PO		**Carrier Name**	ACCESS AMERICA TRANSPORT
	Origin		**Destination**
From Shipper	Tennessee Valley Authority	**To Consignee**	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	**Street**	739 Hastings Street
City-St-Zip	Harriman TN 37748	**City-St-Zip**	Traverse City MI 49686
Phone	865-207-2335	**Phone**	231-941-2230
Contact Name	Adam Johnson	**Contact Name**	Dennis McCauley
Bill Freight to:		**Special Instructions**	Pickup 7/28 per Jason Brown's instructions, deliver 7/29 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples 3200lbs		835
		Units	25.00	25				Total Wgt	835

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges

PrePaid

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATESUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREEDRECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOTTHE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES EXCEEDING.PER

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper TVA-RSI

Per David Mathis **Date** 07-28-11

Daniel Smith 7/29/11
Glec 10:05

Carrier Express-1

Per **Date** 7/28/11

From: Tennessee Valley Authority
189 Lakeshore Drive
Harriman TN 37748

SHIP TO:	**Great Lakes Enviromental Center**	
	739 Hastings Street	
	Traverse City MI 49686	
Contact:	**Dennis McCauley**	**231-941-2230**

----------FOLD HERE----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
157236				Water Samples	

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-080211-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 08/02/2011

Location: ERM9.0

Collected By: M. Greer (RSI), R. Josefczyk (RSI), G. Frye (RSI), E. Arnold (RSI), T. Walls (RSI), C.L. Jackson (TVA), B. Beasley (RSI), S. Bunkley (RSI), A. Johnson (RSI), R. Vance (RSI), B. Bunch (RSI), T. Davis (RSI), ~~D. Craze (RSI)~~ DM 080211

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):

FedEx UPS Bus Client (Courier)

Other (specify): ~~Express 7~~ DM080211 K.M. Newhouse + Sons Trucking

General Comments:
Logbook: TVA-KIF-NTC-TOX-004
Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch H Turbidity Range 5.6 - 9.3 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-080211	G	08/02/2011	0821	(240) 10L cubitainers	9.72	~~080211~~		X	~~080211~~	9032	2.5-7.8	DS	10:00	Clear Good
														12 Cubes Out of Range

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
[signature] / RSI	080211 / 1302	[signature] RSI ~~1302~~ DM080211	080211/1302
[signature] / RSI	080211 / 1315	[signature] GLEC	08/03/11 1000

Associated UPS Tracking #s (if applicable): TVA Padlock #0011658 Intact Custody Seals intact

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	8/3/11			DS	
SAMPLE ID	Bulksw-ckm00 Glec 080211				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9032				
COLLECTION DATE (Time Interval)	8/02/11				
TEMPERATURE (≤6 degrees Celsius[1])	2.5-7.8				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Clear, 12 cubes above 6.0°C				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

Sample Check-In Discrepancy/Comment Form

Project Name: TVA
Project Number: 5069-03 GLC Number: 9032
Date: 8/3/11 Date Sampled: 8/2/11
Technician Initials DS
Project Manager: MW

Discrepancy: Please mark one or more of the following in the box below. Anomalies other than what is listed below can be described in the Comment Section.

Any questions associated with the samples (i.e., damaged containers, improper preservation, unlabeled/illegible sample labels, document discrepancies, insufficient sample volume) must be corrected prior to analysis by contacting the project manager, client and/or state authority. All correspondence shall be documented and discrepancies will be solved as quickly as possible.

Cooler Condition:

- ☐ Samples were not received on wet ice
- ☐ No temperature blank submitted
- ☑ Temperature of samples outside of acceptable range, or samples show evidence of freezing.

Container Label Condition:

- ☐ Not the same ID/info. as on COC
- ☐ Incomplete or missing information: sample ID, collection date/time
- ☐ Other: label smeared, torn, or otherwise illegible

Chain of Custody Discrepancies:

- ☐ No custody seal
- ☐ Custody seal not intact
- ☐ No relinquish signature or name
- ☐ No date/time relinquished
- ☐ No signature
- ☐ Incomplete information

Container Condition:

- ☐ Leaking
- ☐ Broken
- ☐ Loose caps, or without labels

Sample Documentation Discrepancies:

- ☐ Samples not received, but listed on COC
- ☐ Samples received, but not listed on COC
- ☐ Mislabeled toxicology tests, preservatives, etc.
- ☐ Holding time expired
- ☐ Insufficient quantity for analysis

Comments: 12 of 240 Cubes fell out of Range Due to a fracture in the floor weld of Delivery TRUCK 6.2 - 7.8°C

Corrective Actions: (*please use include dates and names when documenting*)

Contact Mailee who emailed Rick ~~Stefano~~ DS 8/3/11 at TVA

MW 8/3/11 Told via email Rick of 12 cubes w/ temps greater than 6°C and the highest being 7.8°C.

Laboratory Technician Signature: [signature] Date: 8/3/11

Project Manager/Laboratory Supervisor Signature: Mailee W. [signature] Date: 8/3/11

COURIER TRANSPORT DOCUMENTATION

DATE: 08/02/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
240	240-2.5 gallon cubitainers of Emory River Water packaged in 120 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 080211 / 1444

Courier Signature/Company: Ken Newhouse / Kirk Johnson

Date / Time: 080211 / 1444

Receipt Signature/Company: [signature] 10:00 Daniel Smith

Date / Time: 8/3/11 10:00

Corresponding Chains of Custody:

BULKSW-080211-GLEC Page 1 of 1	
TVA PADLOCK # 0011658	

Intact

Custod Seals Intact

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

Shipment Date	8/2/2011	Bill of Lading Number	157671
Customer PO		Carrier Name	ACCESS AMERICA TRANSPORT
	Origin		Destination
From Shipper	Tennessee Valley Authority	To Consignee	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	Street	739 Hastings Street
City-St-Zip	Harriman TN 37748	City-St-Zip	Traverse City MI 49686
Phone	865-207-2335	Phone	231-941-2230
Contact Name	Adam Johnson	Contact Name	Dennis McCauley

Bill Freight to:

Special Instructions

Pickup 8/2/11 per Jason Brown's instructions, deliver 8/3/11. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
							Approx. 4800 lbs.		
		Units	25.00	25				Total Wgt	835
								Freight Charges	
								PrePaid	

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREED RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES EXCEEDING.PER

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		Carrier	
TVA-RSI		Tom Newhouse	
Per	Date	Per	Date
David Mathis	080211	[illegible]	8-2-11

David [illegible] 8/3/11
10:00

From: Tennessee Valley Authority
189 Lakeshore Drive
Harriman TN 37748

SHIP TO:	**Great Lakes Enviromental Center**	
	739 Hastings Street	
	Traverse City MI 49686	
Contact:	**Dennis McCauley**	**231-941-2230**

----------FOLD HERE----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
157671				Water Samples	

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-081011-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 08/10/2011

Location: ERM9.0

Collected By: R.C. Josefczyk (RSI), E. Burton (RSI), C.L. Jackson (TVA), J. Kerr (RSI), T. Walls (RSI), E. Hickey (RSI), M. Greer (RSI), R. Vance (RSI), A. Johnson (RSI), E. Arnold (RSI) Bobby Beasley (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

TVA-KIF-NTC-TOX-004

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Express 1

General Comments:

Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch I Turb(NTU) = 12.1 NTU - 19.9 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-081011	G	08/10/2011	0850	(100) 10L cubitainers	10.05	NA	NA	X	NA	GLC#9037	3.3-4.8 See TVA logbook	[illegible]	945	clear yellow odorless

CJ 081011

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona [illegible] / RSI	081011 / 1200	[illegible] RSI	081011 / 1200
[illegible] RSI	081111 / 0657	[illegible] / GLEC	8/12/11 - 0945

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011814 intact all custody seals intact

COURIER TRANSPORT DOCUMENTATION

DATE: 08/11/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
100	100-2.5 gallon cubitainers of Emory River Water packaged in 50 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 081111 / 0744

Courier Signature/Company: Express-1 M. Sutton

Date / Time: 08/11/11 0744

Receipt Signature/Company: Marilu W. Martin / GLEC

Date / Time: 8/12/11 0945

Corresponding Chains of Custody: Temp 32.5

BULKSW-081111-GLEC Page 1 of 1	
TVA PADLOCK # 0011814 ✓ Intact	

BIC #9037

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	8/11/2011	**Bill of Lading Number**	157925
Customer PO		**Carrier Name**	ACCESS AMERICA TRANSPORT
	Origin		**Destination**
From Shipper	Tennessee Valley Authority	**To Consignee**	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	**Street**	739 Hastings Street
City-St-Zip	Harriman TN 37748	**City-St-Zip**	Traverse City MI 49686
Phone	865-207-2335	**Phone**	231-941-2230
Contact Name	Adam Johnson	**Contact Name**	Dennis McCauley
Bill Freight to:		**Special Instructions**	Pickup 8/11/11 per Jason Brown's instructions, deliver 8/12/11. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
							Approx: 2,100 lbs		
		Units	25.00	25				Total Wgt	835

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges

PrePaid

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER

SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		Carrier	
TVA-RSI		Express-1	
Per	Date	Per	Date
David Maths	08.11.11	Mike Suntken	8-11-11

From: Tennessee Valley Authority
189 Lakeshore Drive
Harriman TN 37748

SHIP TO:	**Great Lakes Enviromental Center**	
	739 Hastings Street	
	Traverse City MI 49686	
Contact:	**Dennis McCauley**	**231-941-2230**

----------**FOLD HERE**----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
157925				Water Samples	

Sample
CHECK-IN FORM

CLIENT: TVA - Emory PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	8/12/11			MWG	
SAMPLE ID	BULKSW-Emmg.0-BLEC-08101L				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9037				
COLLECTION DATE (Time Interval)	8/10/11 850				
TEMPERATURE (≤6 degrees Celsius[1])	3.3-4.8 see TVA logbook				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Clear particulate yellow color odorless.				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

RECORD COPY

CHAIN OF CUSTODY RECORD

COC No. BULKSW-081711-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 08/17/2011

Location: ERM9.0

Collected By: M. Greer (RSI), E. Burton (RSI), J. Kerr (RSI), T. Walls (RSI), E. Hickey (RSI), G. Frye (RSI), R. Vance (RSI), A. Johnson (RSI), E. Arnold (RSI), D. Mathis (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Express 1

General Comments:
Logbook: TVA-KIF-NTC-Tox-004
Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch J Turbidity Range 7.8-20.6 NTU

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-081711	G	08/17/2011	0903	(120) 10L cubitainers	9.97	NA	NA	X	NA	9049	6.8-3.8	DS	8:25	Good clear

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
[signature] /RSI	081711/1202	[signature] RSI	081711/1202
[signature] RSI	081811/0708	[signature]	8/19/11 8:25

Associated UPS Tracking #s (if applicable): TVA Padlock # ~~0011726~~ 0011703 All custody Seals intact
DM081811 Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 08/18/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
120	120-2.5 gallon cubitainers of Emory River Water packaged in 60 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 081811 / 0743

Courier Signature/Company: Sharon Guthrie / Express-1

Date / Time: 08/18/11 - 07:43

Receipt Signature/Company: [signature] Glec Daniel Smith

Date / Time: 8/19/11 8:25

Corresponding Chains of Custody:

BULKSW-081711-GLEC Page 1 of 1	
TVA PADLOCK # ~~0011726~~ 0011703 DM08/18/11	

Intact

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	8/18/2011	**Bill of Lading Number**	158256
Customer PO		**Carrier Name**	ACCESS AMERICA TRANSPORT
	Origin		**Destination**
From Shipper	Tennessee Valley Authority	**To Consignee**	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	**Street**	739 Hastings Street
City-St-Zip	Harriman TN 37748	**City-St-Zip**	Traverse City MI 49686
Phone	865-207-2335	**Phone**	231-941-2230
Contact Name	David Mathis	**Contact Name**	Mailee Garton
Bill Freight to:		**Special Instructions**	Pickup 8/18/11 per Jason Brown's instructions, deliver 8/19/11. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
		Units	25.00	25				Total Wgt	835

Express-1
Pro# 824239
Sharon Guthrie
Sharon Guthrie
2703
08/18/11

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges

PrePaid

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER

SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		Carrier	
TVA-RSI		Express-1	
Per	Date	Per	Date
David Mathis	08/8/11	Sharon Guthrie	08/18/11
			8/19/11
			8:25

From: Tennessee Valley Authority
189 Lakeshore Drive
Harriman TN 37748

SHIP TO:	**Great Lakes Enviromental Center**	
	739 Hastings Street	
	Traverse City MI 49686	
Contact:	**Mailee Garton**	**231-941-2230**

----------**FOLD HERE**----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
158256				Water Samples	

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	8/19/11			DS	
SAMPLE ID	BulkSW-081711-GLEC				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9049				
COLLECTION DATE (Time Interval)	8/17/11				
TEMPERATURE (≤6 degrees Celsius[1])	1.8 - 3.8				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	clear No odor				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-082411-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 08/24/2011

Location: ERM9.0

Collected By: R. Josefczyk (RSI), E. Burton (RSI), J. Morris (RSI), J. Kerr (RSI), G. Frye (RSI), G. Schwartz (RSI), R. Vance (RSI), M. Greer (RSI), A. Johnson (RSI), E. Arnold (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

TVA-KIF-NTC-TOX-004

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Express 1

General Comments:

Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch K Turbidity (NTU) = 8.7 - 11.7

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
	----	Date	Time	----	----	Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-082411	G	08/24/2011	0901	(120) 10L cubitainers	9.36	NA	NA	X	NA	9059	2.1-3.2	DS	8:30	Good Clear

KJ 082411

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk / RSI	082411/1210	RSI	082411/1210
RSI	082511/0713	Anita Glec	8/26/11 8:30

Associated UPS Tracking #s (if applicable): **TVA Padlock # 0011805** Intact custody seals good

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	8/25/2011	**Bill of Lading Number**	158652
Customer PO		**Carrier Name**	ACCESS AMERICA TRANSPORT
	Origin		**Destination**
From Shipper	Tennessee Valley Authority	**To Consignee**	Great Lakes Enviromental Center
Street	189 Lakeshore Drive	**Street**	739 Hastings Street
City-St-Zip	Harriman TN 37748	**City-St-Zip**	Traverse City MI 49686
Phone	865-207-2335	**Phone**	231-941-2230
Contact Name	David Mathis	**Contact Name**	Mailee Garton
Bill Freight to:		**Special Instructions**	

Pickup 8/25/11 per Jason Brown's instructions, deliver 8/26/11. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 2 to 4 degress C for the extent of the trip.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			Water Samples		835
		Units	25.00	25				Total Wgt	835

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges

Collect

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY, THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER

SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) | Emergency Response # | (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper		Carrier	
TVA-RS1		EXPRESS-1	
Per	Date	Per	Date
David Mathis	082511	Ron Dailey	8·25·11
		David Mathis	8/26/11

COURIER TRANSPORT DOCUMENTATION

DATE: 08/25/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
120	120-2.5 gallon cubitainers of Emory River Water packaged in 60 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 082511 / 0820

Courier Signature/Company: Ray Daily - EXPRESS-1

Date / Time: 8-25-11 - 0820

Receipt Signature/Company: GLEC

Date / Time: 8/26/11 8:30

Corresponding Chains of Custody:

BULKSW-082411-GLEC Page 1 of 1	
TVA PADLOCK # 0011805 Intact	

GLEC
Great Lakes Environmental Center

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	8/26/11			DS	
SAMPLE ID	Bulk SW-EEM90-GLEC-082411				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9059				
COLLECTION DATE (Time Interval)	8/24/11				
TEMPERATURE (≤6 degrees Celsius[1])	2.1-3.2				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Clear No odor				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

CHAIN OF CUSTODY RECORD | **Page 1 of 1** | **COC No. BULKSW-083111-GLEC**

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 08/31/2011

Location: ERM9.0

Collected By: R. Josefczyk (RSI), E. Burton (RSI), J. Morris (RSI), J. Kerr (RSI), G. Frye (RSI), G. Schwartz (RSI), M. Greer (RSI), E. Hickey (RSI) A. Johnson (RSI), E. Arnold (RSI), D. Mathis (RSI)

Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
Attn: Dennis McCauley
dmccauley@glec.com
231.941.2230
Cell 231.649.3740

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify):_

General Comments:
Logbook TVA-KIF-NTC-TOX-004
Bulk Emory River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.

Batch L Turbidity Range is 15.4 to ~~19.6~~ 21.9 NTU
083111

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth (m)	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
		Date	Time			Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-ERM9.0-GLEC-083111	G	08/31/2011	0901	(80) 10L cubitainers	9.35	NA	NA	X	NA	9062	1.0-2.9	DS	9:00	Good

083111

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
RSI	090111/0838	Glec	9/2/11 9:00

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011757 Intact Custody Seals Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 09/01/11

COURIER COMPANY:

Access America Transport Subcontractor

From:	To:
TVA c/o David Mathis 189 Lakeshore Drive Harriman, TN 37748 865-202-8313	Great Lakes Environmental Center Attn: Dennis McCauley 739 Hastings Street Traverse City, MI 49686 231.941.2230 Cell: 231.649.3740 dmccauley@glec.com

No. of Items:	Description:
80	80-2.5 gallon cubitainers of Emory River Water packaged in 40 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 090111 / 0919

Courier Signature/Company: [illegible] EXPRESS-1

Date / Time: 09-01-11 09:19

Receipt Signature/Company: [illegible] Glec Daniel Smith

Date / Time: 9/2/11 9:00

Corresponding Chains of Custody:

BULKSW-083111-GLEC Page 1 of 1	
TVA PADLOCK # 0011757 Intact	

STRAIGHT BILL OF LADING NOT NEGOTIABLE

Bill of Lading Number	158863		
Shipment Date	09/01/2011		
Customer PO/WO		Carrier Name	ACCESS AMERICA TRANSPORT
	Origin		Destination
From Shipper	TENNESSEE VALLEY AUTHORITY	To Consignee	GREAT LAKES ENVIROMENTAL CENTER
Street	189 LAKESHORE DRIVE	Street	739 HASTINGS STREET
City-St-Zip	HARRIMAN, TN 37748	City-St-Zip	TRAVERSE CITY, MI 49686
Phone	865-207-2335	Phone	231-941-2230
Contact Name	DAVID MATHIS	Contact Name	MAILEE GARTON
Bill Freight to:			Special Instructions

PICKUP 9/1/11 PER JASON BROWN'S INSTRUCTIONS. DELIVER 9/2/11. THERE IS A GATE AT THE SHIPPERS. CALL ADAM JOHNSON AT 865-207-2335 TO OPEN GATE. REEFER MUST MAINTAIN 2 TO 4 DEGRESS C FOR THE EXTENT OF THE TRIP.

Hazmat	HAZ Class	UN Number	Handling Units	Pallets	Package Type	Packing Group	Kind of packaging, descriptions of articles, special marks and exceptions list hazardous materials first	Class	Weight Lbs. (subject to corrections)
			25.00	25			WATER SAMPLES		835

1600 lbs.

Units 25 25

Total Wgt 835

RECEIVED, SUBJECT TO THE CLASSIFICATIONS AND TARIFFS IN AFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.THE PROPERTY DESCRIBED ABOVE IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF PACKAGE UNKNOWN), MARKED, CONSIGNED, AND DESTINED AS INDICATED ABOVE WHICH SAID CARRIER (BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON, CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION. IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION.IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF, SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION ON THE DATE OF THE SHIPMENT.SHIPPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH ALL THE BILL OF LADING TERMS AND CONDITIONS IN THE GOVERNING CLASSIFICATION AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER.

Freight Charges
PrePaid

NOTE:WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY. THE AGREED OR DECLARED VALUE IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING.PER

SUBJECT TO SECTION 7 OF THE CONDITIONS, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNOR WITHOUT RECOURSE THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT THE CARRIER SHALL NOT MAKE DELIVERY OF THE SHIPMENT WITHOUT PAYMENT OF FRIEGHT AND ALL OTHER LAWFUL CHARGES

Units (skids,ctns,bundle,etc.) Emergency Response # (Signature of Consignor)

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

Shipper TVA-RST

Per David Mathis Date 090111

Carrier EXPRESS-1

Per Date 09-01-11

Glec 9/2/11 9:00

From: TENNESSEE VALLEY AUTHORITY
189 LAKESHORE DRIVE
HARRIMAN, TN 37748

SHIP TO: **GREAT LAKES ENVIROMENTAL CENTER**
739 HASTINGS STREET
TRAVERSE CITY, MI 49686
Contact:

----------**FOLD HERE**----------

TSR Number	Reserve#	Material Request#	Work Order#	Item Type	Order Comments
158863				WATER SAMPLES	

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	9/2/11			DS	
SAMPLE ID	BulkSW				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	9062				
COLLECTION DATE (Time Interval)	8/31/11 0901				
TEMPERATURE (≤6 degrees Celsius[1])	1.0-2.9				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	clear odorless				

[1] If out of range see project manager

SAMPLE CHEMISTRY AT TEST TEMPERATURES

					INITIALS
GLC NUMBER					
TEMPERATURE (°C)					
pH (s.u.)					
DISSOLVED OXYGEN (mg/L)					
CONDUCTIVITY (μmhos/cm)					
HARDNESS (mg/L)					
ALKALINITY (mg/L)					
TOTAL CHLORINE (mg/L)*					
TOTAL AMMONIA (mg/L)* as N					

*Check with project manager to see if necessary.
NM: Not Measured, ND: Non-detect

Hardness: GLC#	Hardness: GLC#	Hardness: GLC#	Alkalinity: GLC#	Alkalinity: GLC#	Alkalinity: GLC#
End mL:	End mL:	End mL:	End mL:	End mL:	End mL:
Start mL:	Start mL:	Start mL:	Start mL:	Start mL:	Start mL:
mL used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

Appendix B
Sediment Density Weigh Sheets

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: ~~July~~ 11- Aug 9, 2011 July MWS 9/7/11

Project Number: 5069-03

Test Type: 28-Day Definitive-Whole Sediment ~~Toxicity~~ Test; Survival and Growth Toxicity MWS 9/7/11

Sample ID: EPA 8981 / LCS

Scale: Ohaus PJ400

Test Species: *Hyalella azteca*

Initials MWS

Sediment Denisty and Dilution Chart reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	GLC* 8981 Actual Weight of ERS		Acutal Weight of LCS
1	100 ml	137		170
2	100 ml	140		174
3	100 ml	143		177
Mean		140		173.7
grams/ml		1.40		1.74
grams/100ml		140		173.7

Sediment Dilution Chart										
Test Control Samples	Total Sediment Volume per Concentration (mL)	ERS Control and Laboratory Control						Sediment per replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)		Actual Weight (g)	Weight Based on Density (g)			Volume (mL)
ERS +ERW	1000	1000		1400				100	140	175
LCS + ERW	1000	1000		1740				100	~~140~~ 174	175
LCS + GLW	1000	1000		1740				100	174 MWS 9/7/11	175
GLW	0	0						100	0	175
										175
										175

ERW=Emory River Water
LCS=Laboratory Control Sediment
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Replicate						
	Test Concentration					
Replicate Number						
1						
2						
3						

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: ~~Hy~~ July 11-Aug 9, 2011 MW 9/7/11

Project Number: 5069-03

Test Type: 28-Day Definitive-Whole Sediment ~~Toxicitt~~ Toxicity Test; Survival and Growth MW 9/7/11

Hyalella azteca

Sample ID: ERM 1.0 GLC# 8984

Scale: OHAUS RJ400

Initials MW/DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	ERM 1.0		
1	100 ml	143		
2	100 ml	150		
3	100 ml	148		
Mean		147		
grams/ml		1.47		
grams/100ml		147		

Sediment Dilution Chart

Test Concentratrions	Total Sediment Volume per Sample/Test Organisms	ERM 1.0 GLC No: 8984			ERS Dilution Sediment- GLC No: 8981			Total Weight (g) of Sediment	Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight based on density	Volume (mL)	Actual Weight (g)	Weight based on density		Volume (mL)	Weight (g)	Volume (mL)
10%	1000	100	147	147	900	1260	1260	1407	100	140.7	175
20%	1000	200	294	294	800	1120	1120	1414	100	141.4	175
40%	1000	400	588	588	600	840	840	1428	100	142.8	175
60%	1000	600	882	882	400	560	560	1442	100	144.2	175
80%	1000	800	1176	1176	200	280	280	1456	100	145.6	175
100%	1000	1000	1470	1470	0	~~0~~	~~0~~	1470	100	147.0	175

* Two Overlying Water Renewals with CRW 7.0 in a 24 hour period; 175 mls every 12 hours

ERS=Emory River Sediment

ERW=Emory River Water

LCS=Laboratory Control Sediment

GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Replicate

Replicate Number	Test Concentrations ERM 1.0 10%	20%	40%	60%	80%	100%
1	140	146	131	146.53	138.59	143
2	135	140	133	132.13	137.10	150
3	138	139	139	126.53	140.97	148

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: ~~Jly~~ July 11-Aug 9, 2011 mw 9/7/11

Test Type: 28-Day Definitive-Whole Sediment ~~Toxicitt~~ Toxicity Test; Survival and Growth mw 9/7/11

Project Number: 5069-03

Hyalella azteca

Sample ID: ERM 2.5 GLC# 8985

Scale: OHaus PT400

Initials MW/DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	ERM 2.5		
1	100 ml	153		
2	100 ml	147		
3	100 ml	152		
Mean		150.7		
grams/ml		1.51		
grams/100ml		150.7		

Sediment Dilution Chart

Test Concentratrions	**Total Sediment Volume per Sample/Test Organisms**	ERM 2.5 GLC No: 8985			**Dilution Sediment-GLC No:**			**Total Weight (g) of Sediment**	**Sediment per Replicate**		**Volume of Overlying Water per Renewal***
		Volume (mL)	Actual Weight (g)	Weight based on density	**Volume (mL)**	Actual Weight (g)	Weight based on density		**Volume (mL)**	Weight (g)	**Volume (mL)**
10%	1000	100	151	151	900	1260	1260	1411	100	141.1	175
20%	1000	200	302	302	800	1120	1120	1422	100	142.2	175
40%	1000	400	604	604	600	840	840	1444	100	144.4	175
60%	1000	600	906	906	400	560	560	1466	100	146.6	175
80%	1000	800	1208	1208	200	280	280	1488	100	148.8	175
100%	1000	1000	1510	1510	0	0	0	1510	100	151.0	175

* Two Overlying Water Renewals with CRW 7.0 in a 24 hour period; 175 mls every 12 hours

ERS=Emory River Sediment

ERW=Emory River Water

LCS=Laboratory Control Sediment

GLW=GLEC Laboratory Water

mw 9/7/11

Actual Weight of Sediment Added to Replicate						
	Test Concentrations					
Replicate Number	10%	20%	40%	60%	80%	100%
1	142	153	148	146	150	153
2	141	156	147	151	145	147
3	135	145	141	143	148	152

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: ~~Hy~~ July 11-Aug 9, 2011 NW 9/7/11

Project Number: 5069-03

Test Type: 28-Day Definitive-Whole Sediment ~~Toxicitt~~ Toxicity Test; Survival and Growth NW 9/7/11

Sample ID: ERM 3.5

Scale: Ohaus PJ 400

Hyalella azteca

Initials NW/DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	ERM 3.5 GLC #8987		
1	100 ml	158		
2	100 ml	162		
3	100 ml	166		
Mean		162		
grams/ml		1.62		
grams/100ml		162		

Sediment Dilution Chart											
Test Concentratrions	Total Sediment Volume per Sample/Test Organisms	ERM 3.5 GLC No: 8987			Dilution Sediment-GLC No:			Total Weight (g) of Sediment	Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight based on density	Volume (mL)	Actual Weight (g)	Weight based on density		Volume (mL)	Weight (g)	Volume (mL)
10%	1000	100	162	162	900	1260	1260	1422	100	142.2	175
20%	1000	200	324	324	800	1120	1120	1444	100	144.4	175
40%	1000	400	648	648	600	840	840	1488	100	148.8	175
60%	1000	600	972	972	400	560	560	1532	100	153.2	175
80%	1000	800	1296	1296	200	280	280	1576	100	157.6	175
100%	1000	1000	1620	1620	0	0	0	1620	100	162	175

* Two Overlying Water Renewals with CRW 7.0 in a 24 hour period; 175 mls every 12 hours

ERS=Emory River Sediment

ERW=Emory River Water

LCS=Laboratory Control Sediment

GLW=GLEC Laboratory Water

NW 9/7/11

Actual Weight of Sediment Added to Replicate						
	Test Concentrations					
Replicate Number	10%	20%	40%	60%	80%	100%
1	154	145	144	152	166	158
2	137	142	145	154	169	162
3	140	138	145	151	160	166

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: ~~Jy~~ July 11-Aug 9, 2011 NWS 9/7/11

Test Type: 28-Day Definitive-Whole Sediment ~~Toxicitt~~ Test; Survival and Growth Toxicity NWS 9/7/11

Hyalella azteca

Initials NWS/DS

Project Number: 5069-03

Sample ID: ERM 5.5 GLC# 8989

Scale: OHaus PJ400

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	ERM 5.5 GLC# 8989		
1	100 ml	130		
2	100 ml	135		
3	100 ml	132		
Mean		132.3		
grams/ml		1.32		
grams/100ml		132.3		

Sediment Dilution Chart

Test Concentratrions	Total Sediment Volume per Sample/Test Organisms	ERM 5.5 GLC No: 8989			Dilution Sediment-GLC No:			Total Weight (g) of Sediment	Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight based on density	Volume (mL)	Actual Weight (g)	Weight based on density		Volume (mL)	Weight (g)	Volume (mL)
10%	1000	100	132	132	900	1260	1260	1392	100	139.2	175
20%	1000	200	265	265	800	1120	1120	1385	100	138.5	175
40%	1000	400	529	529	600	840	840	1369	100	136.9	175
60%	1000	600	794	794	400	560	560	1354	100	135.4	175
80%	1000	800	1058	1058	200	280	280	1338	100	133.8	175
100%	1000	1000	1323	1323	0	0	0	1323	100	132.3	175

* Two Overlying Water Renewals with CRW 7.0 in a 24 hour period; 175 mls every 12 hours
ERS=Emory River Sediment
ERW=Emory River Water
LCS=Laboratory Control Sediment
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Replicate

Replicate Number	Test Concentrations 10%	20%	40%	60%	80%	100%
1	137	143	135	137	134	130
2	143	142	139	137	137	135
3	144	146	140	135	137	132

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: July 15, 2011

Test Type: Definitive Whole Sediment ~~Toxicitt~~ Toxicity Test; Survival, Growth, and Emergence

Project Number: 5069-03

Sample ID: ERM / LCS
Scale: OHause PJ400

Test Species: *Chironomus dilutus*
Initials [illegible]

Sediment Denisty and Dilution Chart reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	GLC #8981 ERM Actual Weight of ERS		Acutal Weight of LCS
1	100 ml	137		170
2	100 ml	140		174
3	100 ml	143		177
Mean		140		173.7
grams/ml		1.40		1.74
grams/100ml		140		174

Sediment Dilution Chart										
Test Control Samples	Total Sediment Volume per Concentration (mL)	ERS Control and Laboratory Control						Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)		Actual Weight (g)	Weight Based on Density (g)			Volume (mL)
ERS +ERW	1200	1200	1680	1680				100	140	175
LCS + ERW	1200	1200	2088	2088				100	174	175
LCS + GLW	1200	1200	2088	2088				100	174	175
GLW	0	0						0		175
										175
										175

ERW=Emory River Water
LCS=Laboratory Control Sediment
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Replicate						
	Test Concentration					
Replicate Number						
1						
2						
3						

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: July 15, 2011

Toxicity [illegible] 9/7/11

Test Type: Definitve Whole Sediment ~~Toxicitt~~ Test; Survival, Growth, emergence

Project Number: 5069-03

Sample ID: ERm 0.5 GLC# 8982
Scale: OHaus PJ400

Test Species: *Chironomus dilutus*
Initials [illegible]/DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	ERm 0.5 GLC# 8982		
1	100 ml	130.80 [illegible]		
2	100 ml	135.0		
3	100 ml	140.0		
Mean		137.7		
grams/ml		1.376		
grams/100ml		137.7		

Sediment Dilution Chart

Test Concentratrions	Total Sediment Volume per Sample/Test Organisms	[illegible] 9/7/11 ERm 0.5 GLC No: 8982			Dilution Sediment-ERM GLC No:			Total Weight (g) of Sediment	Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight based on density	Volume (mL)	Actual Weight (g)	Weight based on density		Volume (mL)	Weight (g)	Volume (mL)
10%	1200	120	165.0	165.2	1080	1512	1512	1677	100	167.7	175
20%	1200	240	331	330.5	960	1344	1344	1675	100	167.5	175
40%	1200	480	661	660.9	720	1008	1008	1669	100	166.9	175
60%	1200	720	991	991.4	480	672	672	1663	100	166.3	175
80%	1200	960	1322	1321.9	240	336	336	1658	100	165.8	175
100%	1200	1200	1652	1652.4	~~0~~ 1200 [illegible]	0	0	1652	100	165.2	175

* Two Overlying Water Renewals with in a 24 hour period; 175 mls every 12 hours

QC: [illegible]

ERS=Emory River Sediment
ERW=Emory River Water
LCS=Laboratory Control Sediment
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Repluicate

Replicate Number	Test Concentrations 10%	20%	40%	60%	80%	100%
	127	137	130	130	136	138
	132	130	136	134	136	135
	128	132	133	132	136	~~137~~ 140

[illegible] 9/7/11
141
140

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: July 15, 2011

Test Type: Definitve Whole Sediment ~~Toxicitt~~ Toxicity Test; Survival, Growth, emergence

Project Number: 5069-03

Sample ID: ERM 1.0 GLC# 8984

Scale: Ohaus AF400

Test Species: *Chironomus dilutus*

Initials DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	ERM 1.0		
1	100 ml	143		
2	100 ml	150		
3	100 ml	148		
Mean		147		
grams/ml		1.47		
grams/100ml		147		

Sediment Dilution Chart

Test Concentratrions	Total Sediment Volume per Sample/Test Organisms	ERM 1.0 GLC No: 8984			Dilution Sediment-ERM GLC No:			Total Weight (g) of Sediment	Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight based on density	Volume (mL)	Actual Weight (g)	Weight based on density		Volume (mL)	Weight (g)	Volume (mL)
10%	1200	120	176.	176.4	1080	1512	1512	1688	100	168.8	175
20%	1200	240	352	352.8	960	1344	1344	1696	100	169.6	175
40%	1200	480	706	705.6	720	1008	1008	1714	100	171.4	175
60%	1200	720	1058	1058.4	480	672	672	1730	100	173.0	175
80%	1200	960	1411	1411.2	240	336	336	1747	100	174.7	175
100%	1200	1200	1764	1764	0 ~~1200~~	0	0	1764	100	176.4	175

* Two Overlying Water Renewals with in a 24 hour period; 175 mls every 12 hours
ERS=Emory River Sediment
ERW=Emory River Water
LCS=Laboratory Control Sediment
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Repluicate							
	Test Concentrations						
Replicate Number	10%	20%	40%	60%	80%	100%	
	140	137	145	138	143	143	147
	141	143	140	140	141	150	147
	140	138	143	141	139	148	149

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: July 15, 2011

Test Type: Definitve Whole Sediment ~~Toxicitt~~ Toxicity Test; Survival, Growth, emergence

NW 9/7/11

Project Number: 5069-03

Sample ID: ERM 2.5 GLC#8985 ~~1500.4~~

Scale: Ohaus 05400

Test Species: *Chironomus dilutus*

Initials DS / NW

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	ERM 2.5		
1	100 ml	153		
2	100 ml	147		
3	100 ml	152		
Mean		150.7		
grams/ml		1.507		
grams/100ml		150.7		

Sediment Dilution Chart

Test Concentratrions	Total Sediment Volume per Sample/Test Organisms	ERM 2.5 GLC No: 8985			Dilution Sediment-ERM GLC No:			Total Weight (g) of Sediment	Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight based on density	Volume (mL)	Actual Weight (g)	Weight based on density		Volume (mL)	Weight (g)	Volume (mL)
10%	1200	120	181	181	1080	1512	1512	1693	100	169.3	175
20%	1200	240	362	362	960	1344	1344	1706	100	170.6	175
40%	1200	480	724	723.36	720	1008	1008	1732	100	173.2	175
60%	1200	720	1085	1085	480	672	672	1757	100	175.7	175
80%	1200	960	1447	1447	240	336	336	1783	100	178.3	175
100%	1200	1200	1808	1808.4	0 ~~1200~~	Ø	0	1808	100	180.8	175

* Two Overlying Water Renewals with in a 24 hour period; 175 mls every 12 hours

ERS=Emory River Sediment

ERW=Emory River Water

LCS=Laboratory Control Sediment

GLW=GLEC Laboratory Water

QC- NW

Actual Weight of Sediment Added to Repluicate						
	Test Concentrations					
Replicate Number	10%	20%	40%	60%	80%	100%
	147	145	139	145	150	149
	145	148	145	148	148	149
	148	148	145	147	148	147

Project Name: Tennesse Valley Authority (TVA)-Emory River

Test Dates: July 15, 2011

Toxicity mw 9/7/11

Test Type: Definitve Whole Sediment ~~Toxicity~~ Test; Survival, Growth, emergence

Project Number: 5069-03

Sample ID: ERM 3.5 GLC# 8987

Scale: OHaus PA400

Test Species: *Chironomus dilutus*

Initials MW / DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	ERM 3.5		
1	100 ml	158		
2	100 ml	162		
3	100 ml	166		
Mean		162		
grams/ml		1.62		
grams/100ml		162		

Sediment Dilution Chart											
Test Concentratrions	Total Sediment Volume per Sample/Test Organisms	ERM 3.5 GLC No: 8987			Dilution Sediment- ERM GLC No:			Total Weight (g) of Sediment	Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight based on density	Volume (mL)	Actual Weight (g)	Weight based on density		Volume (mL)	Weight (g)	Volume (mL)
10%	1200	120	194	194.4	1080	1512	1512	1706	100	170.6	175
20%	1200	240	389	388.8	960	1344	1344	1733	100	173.3	175
40%	1200	480	778	777.6	720	1008	1008	1786	100	178.6	175
60%	1200	720	1166	1166.4	480	672	672	1838	100	183.8	175
80%	1200	960	1555	1555.2	240	336	336	1891	100	189.1	175
100%	1200	1200	1944	1944	1200	0	0	1944	100	194.4	175

* Two Overlying Water Renewals with in a 24 hour period; 175 mls every 12 hours
ERS=Emory River Sediment
ERW=Emory River Water
LCS=Laboratory Control Sediment
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Repluicate						
	Test Concentrations					
Replicate Number	10%	20%	40%	60%	80%	100%
	152	152	152	158	160	162
	160	152	152	160	160	162
	155	160	152	157	161	162

Appendix C
Overlying Water Quality Summaries

- *Chironomus dilutus*
- *Hyalella azteca*
- Emory River Water

Appendix C 1
Overlying Water Quality Summaries

- *Chironomus dilutus*

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Data Entry

Date	Initials	Data Entry
7/20/11	NS	days 0-5
8/1/2011	DS	day 6-12
8/9/11	DS	Day 13-17 Survival weight replicate #
8/10/2011	DS	Day 18-20
8/16/11	KN	Day 21-30
8/18/2011	TB	Day 31-33
8/23/11	KN	Day 34-38
8/25/2011	KN	Day 39-40
9/7/11	DS	day 41-42
9/13/2011	DS	day 42-45
9/15/11	DS	day 45-52 non end days
9/21/2011	DS	day 52-61 all emergence and end days

100% QC data

8/16/11	MLL	Day 0-7
8/23/2011	KN	Day 8-10
8/25/11	KN	Day 11-20
8/25/2011	KN	Day 20 Survival, Weight, Biomass
9/6/2011	DS	Day 21-30
9/7/2011	DS	Day 31-40
9/16/2011	NS	days 45-52 non end days
9/21/2011	AS	day 52-61 all emergence and end days

10% QC

9/23/2011	eb	all

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: GLW- Water Only Exposure

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.8	8.10	8.1	301.0	100	128	0.14		
		22.9	8.12	8.2	291.0					
16-Jul-11	1	23.1								
		23.2								
17-Jul-11	2	23.1								
		23.1								
18-Jul-11	3	23.2	7.68	6.7	300.0					
		23.2	7.82	6.6	299.8					
19-Jul-11	4	22.9		5.1						
		23.0		4.9						
20-Jul-11	5	22.7	7.58	4.5						
		22.7	7.65	5.0						
21-Jul-11	6	23.0								
		23.2								
22-Jul-11	7	22.7	7.48	5.0						
		22.7	7.39	4.7						
23-Jul-11	8	22.9								
		22.9								
24-Jul-11	9	23.0								
		23.0								
25-Jul-11	10	22.8	7.19	3.9	305.0					
		22.9	7.20	4.3	306.0					
26-Jul-11	11	23.0		3.6						
		23.0		4.3						
27-Jul-01	12	22.8	7.55	4.9						
		22.8	7.61	4.7						
28-Jul-11	13	22.8		5.8						
		22.9		5.9						
29-Jul-11	14	23.0	7.56	5.5						
		23.1	7.59	5.2						
30-Jul-11	15	22.6		5.1						
		22.7		5.2						
31-Jul-11	16	23.4		7.3						
		23.5		7.1						
1-Aug-11	17	23.9	7.38	2.5	301.0					
		23.9	7.52	3.4	304.0					
2-Aug-11	18	22.0		2.7						
		22.0		3.0						
3-Aug-11	19	22.6	7.86	6.6						
		22.6	7.78	6.2						
4-Aug-11	20	22.3	7.72	6.0	305.0	106	136	0.15		
		22.3	7.76	6.1	303.0					
5-Aug-11	21	22.7	7.78	6.2						
		22.7	7.85	6.4						
6-Aug-11	22	22.5		4.2						
		22.6		4.6						
7-Aug-11	23	22.6		6.5						
		22.6		6.5						
8-Aug-11	24	22.6	7.51	5.6	305.0					
		22.6	7.78	5.9	303.0					
9-Aug-11	25	22.6		7.0						
		22.6		7.2						
10-Aug-11	26	22.5	7.48	5.4						
		22.4	7.56	5.8						
11-Aug-11	27	22.7		6.4						
		22.7		6.6						
12-Aug-11	28	22.7	7.48	2.7						
		22.8	7.61	2.9						
13-Aug-11	29	22.7		5.8						
		22.7		5.9						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: GLW- Water Only Exposure

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
14-Aug-11	30	22.8		6.0						
		22.8		6.6						
15-Aug-11	31	22.5	7.92	6.3	302.0					
		22.5	7.98	6.6	302.0					
16-Aug-11	32	22.6		7.0						
		22.8		6.6						
17-Aug-11	33	22.6	7.66	5.8						
		22.6	7.69	6.5						
18-Aug-11	34	22.7		6.5						
		22.6		6.5						
19-Aug-11	35	22.7	7.47	5.0						
		22.6	7.66	5.8						
20-Aug-11	36	22.7		4.7						
		22.7		5.0						
21-Aug-11	37	22.7		5.9						
		22.8		5.6						
22-Aug-11	38	23.1	7.92	7.1	303.0					
		23.1	7.63	6.9	302.0					
23-Aug-11	39	23.3		6.0						
		23.3		6.1						
24-Aug-11	40	22.8	7.54	5.0						
		22.8	7.65	5.8						
25-Aug-11	41	23.2		5.5						
		23.2		5.8						
26-Aug-11	42	23.1	7.73	5.6						
		23.1	7.57	4.6						
27-Aug-11	43	23.2		6.2						
		23.2		5.6						
28-Aug-11	44	23.0		3.1						
		23.1		3.4						
29-Aug-11	45	23.6	7.46	3.5	306.0					
		23.6	7.56	4.5	303.0					
30-Aug-11	46	23.1		4.2						
		23.2		4.4						
31-Aug-11	47	23.1	7.73	5.4						
		23.0	7.66	4.6						
1-Sep-11	48	23.4		6.1						
		23.4		5.7						
2-Sep-11	49	23.1	7.56	5.7						
		23.1	7.54	5.9						
3-Sep-11	50	23.0		6.0						
		23.2		6.2						
4-Sep-11	51	22.9		5.1						
		23.0		5.4						
5-Sep-11	52	23.1	7.65	5.0	304.0					
		23.1	7.66	5.0	303.0					
6-Sep-11	53	23.2		5.3						
		23.2		5.5						
7-Sep-11	54	23.1	7.64	5.9						
		23.0	7.67	5.6						
8-Sep-11	55	23.0		6.5						
		23.0		6.9						
9-Sep-11	56	22.8	7.67	6.0						
		22.7	7.82	6.5						
10-Sep-11	57	23.2		6.0						
		23.2		6.5						
11-Sep-11	58	23.1	7.98	7.0	301.0	98	108	0.00	U	
Sediment Ended		23.0	7.60	5.4	304.0					
		23.0	7.81	5.0	302.0					

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: GLW- Water Only Exposure

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.65**	**5.5**	**302**	**101**	**124**	**0.10**		
Number		**119**	**55**	**109**	**23**	**3**	**3**	**3**		
Max #		**23.9**	**8.12**	**8.2**	**306**	**106**	**136**	**0.15**		
Min#		**22.0**	**7.19**	**2.5**	**291**	**98**	**108**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: LCS+GLW Lab Control Sediment

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.0	7.68	5.6	346.0	130	120	0.52		
		23.0	7.60	5.4	276.0					
16-Jul-11	1	23.1								
		23.2								
17-Jul-11	2	23.0								
		23.0								
18-Jul-11	3	23.2	7.58	4.7	316.0					
		23.2	7.64	5.2	323.0					
19-Jul-11	4	23.1		3.9						
		23.1		4.1						
20-Jul-11	5	22.7	7.58	4.2						
		22.7	7.65	3.9						
21-Jul-11	6	23.1								
		23.1								
22-Jul-11	7	22.7	7.61	3.6						
		22.7	7.62	3.7						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	23.1								
		23.1								
25-Jul-11	10	22.9	7.14	2.6	331.0					
		22.9	7.19	3.3	324.0					
26-Jul-11	11	23.0		2.2						
		23.0		2.5						
27-Jul-01	12	22.8	7.51	3.1						
		22.8	7.50	2.5						
28-Jul-11	13	22.9		2.3						
		22.9		2.0						
29-Jul-11	14	23.1	7.50	3.5						
		22.7	7.55	4.0						
30-Jul-11	15	22.3		2.8						
		22.2		2.2						
31-Jul-11	16	23.5		3.4						
		23.6		3.0						
1-Aug-11	17	23.9	7.45	4.5	310.0					
		23.8	7.69	2.6	314.0					
2-Aug-11	18	22.0		1.6						
		22.1		1.5						
3-Aug-11	19	22.6	7.54	3.5						
		22.5	7.50	1.9						
4-Aug-11	20	22.3	7.44	3.0	300.0	112	136	0.12		
		22.4	7.46	2.7	308.0					
5-Aug-11	21	22.7	7.73	3.0						
		22.7	7.43	3.4						
6-Aug-11	22	22.6		2.9						
		22.6		2.0						
7-Aug-11	23	22.6		3.5						
		22.6		3.2						
8-Aug-11	24	22.5	7.38	2.5	305.0					
		22.4	7.45	2.4	307.0					
9-Aug-11	25	22.6		4.8						
		22.6		2.6						
10-Aug-11	26	22.3	7.43	2.5						
		22.3	7.46	2.3						
				3.2						D.O. checked twice due to low reading
				3.1						
11-Aug-11	27	22.3		2.9						
		22.3		3.6						
12-Aug-11	28	22.7	7.71	6.2						
		22.7	7.78	5.9						
13-Aug-11	29	22.7		3.0						
		22.8		3.3						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: LCS+GLW Lab Control Sediment

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
14-Aug-11	30	22.8		4.9						
		22.8		3.5						
15-Aug-11	31	22.5	7.59	3.6	300.0					
		22.6	7.64	4.2	305.0					
16-Aug-11	32	22.7		3.3						
		22.8		4.2						
17-Aug-11	33	22.6	7.43	3.5						
		22.6	7.45	4.1						
18-Aug-11	34	22.5		4.1						
		22.5		4.0						
19-Aug-11	35	22.6	7.40	2.9						
		22.6	6.26	2.6						
20-Aug-11	36	22.7		3.5						
		22.7		3.5						
21-Aug-11	37	22.8		4.1						
		22.8		3.8						
22-Aug-11	38	23.1	7.62	5.6	302.0					
		23.1	7.61	5.0	305.0					
23-Aug-11	39	23.3		3.0						
		23.3		3.4						
24-Aug-11	40	22.8	7.51	4.0						
		22.8	7.51	4.3						
25-Aug-11	41	23.3		3.0						
		23.3		3.6						
26-Aug-11	42	23.0	7.69	4.3						
		23.1	7.68	4.0						
				3.7						
				3.9						
27-Aug-11	43	23.2		4.3						
		23.2		3.0						
28-Aug-11	44	23.0		2.5						
		23.0		2.6						
29-Aug-11	45	23.6	7.55	3.1	315.0					
		23.6	7.56	3.2	313.0					
30-Aug-11	46	23.2		3.5						
		23.2		3.3						
31-Aug-11	47	23.1	7.66	3.9						
		23.1	7.51	3.3						
1-Sep-11	48	23.3		3.1						
		23.3		3.2						
2-Sep-11	49	22.8	7.44	3.2						
		22.9	7.49	3.3						
3-Sep-11	50	23.3		4.2						
		23.2		4.3						
4-Sep-11	51	22.9	7.43	3.1	312.0	106	144	0.00	U	
Sediment Ended		22.9	7.54	3.3	307.0					
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: LCS+GLW Lab Control Sediment

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.51**	**3.5**	**311**	**116**	**133**	**0.21**		
Number		**104**	**48**	**98**	**20**	**3**	**3**	**3**		
Max #		**23.9**	**7.78**	**6.2**	**346**	**130**	**144**	**0.52**		
Min#		**22.0**	**6.26**	**1.5**	**276**	**106**	**120**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

TE = Technician Error

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: LCS+ERW

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.2	7.48	5.7	167.6	64	68	0.77		
		22.5	7.50	5.7	158.0					
16-Jul-11	1	23.6								
		23.6								
17-Jul-11	2	22.7								
		22.8								
18-Jul-11	3	23.0	7.08	3.9	127.0					
		22.9	7.16	4.6	120.1					
19-Jul-11	4	22.7		3.8						
		22.7		3.7						
20-Jul-11	5	22.2	7.31	2.8						
		22.2	7.30	3.0						
21-Jul-11	6	22.6								
		22.7								
22-Jul-11	7	22.7	7.63	3.4						
		22.7	7.59	4.0						
23-Jul-11	8	23.0								
		22.9								
24-Jul-11	9	22.8								
		22.9								
25-Jul-11	10	22.5	7.12	2.6	139.4					
		22.5	7.19	3.6	144.5					
26-Jul-11	11	22.8		2.1						
		22.8		3.0						
27-Jul-01	12	22.5	7.07	2.2						
		22.5	7.06	2.1						
28-Jul-11	13	22.7		2.6						
		22.8		2.5						
29-Jul-11	14	22.8	7.08	2.8						
		22.8	7.10	2.7						
30-Jul-11	15	23.1		2.3						
		23.3		2.2						
31-Jul-11	16	23.2		3.0						
		22.9		2.8						
1-Aug-11	17	23.7	7.12	2.6	149.1					
		23.6	7.19	2.8	158.4					
2-Aug-11	18	23.7		2.0						
		23.6		2.5						
3-Aug-11	19	22.8	7.22	2.5						
		22.8	7.15	1.9						
4-Aug-11	20	22.8	7.09	2.7	112.0	46	52	0.37		
		22.7	7.14	2.5	117.4	40	56	0.23		
5-Aug-11	21	22.5	7.08	2.5						
		22.5	7.15	2.7						
6-Aug-11	22	22.3		2.0						
		22.4		1.5						
7-Aug-11	23	22.5		3.5						
		22.6		3.4						
8-Aug-11	24	22.6	7.06	2.2	122.2					
		22.6	7.11	2.4	121.8					
9-Aug-11	25	22.3		2.0						
		22.4		2.2						
10-Aug-11	26	22.4	7.08	1.9						
		22.4	7.15	2.5						
				2.6						D.O.
				3.2						checked
11-Aug-11	27	22.3		3.8						
		22.3		4.0						
12-Aug-11	28	22.4	7.09	2.6						
		22.3	7.18	2.4						
13-Aug-11	29	22.7		2.6						
		22.7		3.0						
14-Aug-11	30	22.5		1.3						
		22.4		1.7						
15-Aug-11	31	22.8	6.81	4.0	107.8					
		22.3	6.89	2.4	116.3					
16-Aug-11	32	22.3		2.6						
		22.3		2.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: LCS+ERW

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
17-Aug-11	33	22.4	7.17	3.8						
		22.6	7.21	3.1						
18-Aug-11	34	22.3		3.2						
		22.2		3.3						
19-Aug-11	35	22.5	7.23	2.1						
		22.5	7.24	2.5						
20-Aug-11	36	22.7		3.2						
		22.6		3.1						
21-Aug-11	37	22.6		3.3						
		22.6		4.0						
22-Aug-11	38	22.3	7.12	3.1	155.8					
		22.4	7.19	2.8	152.6					
23-Aug-11	39	22.6		3.2						
		22.6		3.3						
24-Aug-11	40	22.4	7.27	3.5						
		22.5	7.25	3.4						
25-Aug-11	41	22.6		3.4						
		22.6		3.6						
26-Aug-11	42	22.3	6.28	3.1						
		22.4	6.28	2.7						
27-Aug-11	43	22.5		2.9						
		22.5		3.7						
28-Aug-11	44	22.5		1.4						
		22.5		2.1						
29-Aug-11	45	22.6	7.26	3.1	266.1					
		22.6	7.26	2.8	257.8					
30-Aug-11	46	22.6		2.6						
		22.6		1.6						
31-Aug-11	47	22.0	7.33	1.9						
		22.0	7.45	2.6						
1-Sep-11	48	22.8		1.0						
		22.8		2.6						
2-Sep-11	49	23.1	7.44	4.0						
		23.1	7.47	4.5						
3-Sep-11	50	22.8		3.1						
		22.8		3.4						
4-Sep-11	51	22.8		3.4						
		22.9		3.7						
5-Sep-11	52	22.8	7.46	2.7	258.9					
		22.8	7.43	2.7	256.8					
6-Sep-11	53	23.2		3.0						
		23.9		3.4						
7-Sep-11	54	22.8	7.32	3.1						
		22.9	7.39	3.5						
8-Sep-11	55	23.1	7.29	3.3	250.6	102	116	0.17		
Sediment Ended		23.1	7.40	4.1	250.5					
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: LCS+ERW

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.7**	**7.19**	**2.9**	**169**	**63**	**73**	**0.39**		
Number		**112**	**52**	**104**	**22**	**4**	**4**	**4**		
Max #		**23.9**	**7.63**	**5.7**	**266**	**102**	**116**	**0.77**		
Min#		**22.0**	**6.28**	**1.0**	**108**	**40**	**52**	**0.17**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: ERS(8981)+ERW

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.5	6.82	5.0	112.1	36	36	1.90		
		22.5	6.82	5.1	110.1					
16-Jul-11	1	23.6								
		23.5								
17-Jul-11	2	22.8								
		22.8								
18-Jul-11	3	22.9	6.95	4.6	98.5					
		22.9	6.96	4.9	98.6					
19-Jul-11	4	22.7		4.2						
		22.7		4.3						
20-Jul-11	5	22.3	7.04	3.4						
		22.3	7.00	3.2						
21-Jul-11	6	22.7								
		22.7								
22-Jul-11	7	22.6	7.18	4.4						
		22.6	7.20	4.4						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	22.8								
		22.9								
25-Jul-11	10	22.5	6.93	2.1	111.1					
		22.5	6.97	4.1	103.6					
26-Jul-11	11	22.9		4.4						
		22.9		4.2						
27-Jul-01	12	22.6	6.85	2.7						
		22.6	6.80	2.3						
28-Jul-11	13	22.7		4.0						
		22.8		4.1						
29-Jul-11	14	22.8	6.95	4.0						
		22.8	6.91	3.7						
30-Jul-11	15	23.2		3.7						
		23.2		3.6						
31-Jul-11	16	23.2		4.1						
		23.2		3.9						
1-Aug-11	17	23.7	6.87	2.8	88.4					
		23.7	6.96	2.5	123.4					
2-Aug-11	18	23.2		2.7						
		23.2		3.0						
3-Aug-11	19	22.7	7.03	3.6						
		22.8	7.06	3.5						
4-Aug-11	20	22.7	7.00	2.8	95.6	32	40	0.20		
		22.6	7.03	2.7	96.6					
5-Aug-11	21	22.5	6.97	2.9						
		22.5	7.04	3.0						
6-Aug-11	22	22.3		2.5						
		22.3		2.4						
7-Aug-11	23	22.6		3.7						
		22.5		3.6						
8-Aug-11	24	22.6	6.92	2.7	100.5					
		22.5	6.90	2.7	98.1					
9-Aug-11	25	22.3		4.9						
		22.4		4.5						
10-Aug-11	26	22.4	6.94	3.1						
		22.4	6.95	3.0						
11-Aug-11	27	22.7		4.0						
		22.6		4.1						
12-Aug-11	28	22.4	7.15	2.9						
		22.3	7.08	2.7						
13-Aug-11	29	22.3		3.0						
		22.3		3.4						
14-Aug-11	30	22.4		3.3						
		22.4		3.8						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: ERS(8981)+ERW

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Aug-11	31	22.3	6.80	3.8	93.1					
		22.3	6.84	3.6	93.7					
16-Aug-11	32	22.3		3.9						
		22.3		4.2						
17-Aug-11	33	22.5	7.09	4.0						
		22.6	7.14	4.5						
18-Aug-11	34	22.3		3.8						
		22.2		3.9						
19-Aug-11	35	22.5	7.16	3.0						
		22.5	7.15	3.4						
20-Aug-11	36	22.6		3.4						
		22.6		3.4						
21-Aug-11	37	22.6		3.6						
		22.5		3.4						
22-Aug-11	38	22.3	7.21	4.1	141.8					
		22.3	7.21	4.8	138.4					
23-Aug-11	39	22.6		4.4						
		22.6		4.0						
24-Aug-11	40	22.5	7.26	3.7						
		22.5	7.25	4.7						
25-Aug-11	41	22.5		4.4						
		22.6		3.9						
26-Aug-11	42	22.3	7.07	4.1						
		22.4	7.09	4.4						
27-Aug-11	43	22.5		3.7						
		22.5		4.5						
28-Aug-11	44	22.4		3.3						
		22.3		3.1						
29-Aug-11	45	22.6	7.30	4.0	252.1					
		22.6	7.33	3.6	254.4					
30-Aug-11	46	22.5		4.1						
		22.5		2.9						
31-Aug-11	47	22.0	7.40	3.2						
		22.0	7.46	3.6						
1-Sep-11	48	22.8		3.8						
		22.8		4.3						
2-Sep-11	49	23.0	7.44	4.7						
		23.0	7.40	4.7						
3-Sep-11	50	22.9	7.29	4.0	250.5	100	120	0.08		
Sediment Ended		22.8	7.34	3.7	248.1	100	124			
4-Sep-11	51									
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERS(8981)+ERW

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.6**	**7.07**	**3.7**	**135**	**67**	**80**	**0.73**		
Number		**102**	**48**	**92**	**20**	**4**	**4**	**3**		
Max #		**23.7**	**7.46**	**5.1**	**254**	**100**	**124**	**1.90**		
Min#		**22.0**	**6.80**	**2.1**	**88**	**32**	**36**	**0.08**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.1	7.08	5.4	108.1	40	40	1.78		
		23.1	7.03	5.5	119.6					
16-Jul-11	1	23.2								
		23.2								
17-Jul-11	2	23.1								
		23.1								
18-Jul-11	3	23.2	6.99	4.7	95.8					
		23.2	6.99	5.2	97.5					
19-Jul-11	4	23.1		3.5						
		23.1		4.1						
20-Jul-11	5	22.8	7.08	3.5						
		22.8	7.02	3.6						
21-Jul-11	6	23.1								
		23.1								
22-Jul-11	7	22.7	6.92	3.7						
		22.7	6.97	4.1						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	23.2								
		23.2								
25-Jul-11	10	23.0	6.60	2.8	109.9					
		23.0	6.49	2.2	103.3					
26-Jul-11	11	23.1		2.3						
		23.3		3.9						
27-Jul-01	12	22.9	6.91	2.1						
		22.8	6.99	3.1						
28-Jul-11	13	23.2		3.0						
		23.2		3.0						
29-Jul-11	14	23.1	7.37	4.2						
		22.8	7.54	4.7						
30-Jul-11	15	22.7		3.9						
		22.7		3.3						
31-Jul-11	16	23.3		4.6						
		23.3		4.9						
1-Aug-11	17	24.0	6.98	2.6	98.1					
		23.8	6.99	2.9	100.0					
2-Aug-11	18	22.1		1.7						
		22.1		2.8						
3-Aug-11	19	22.6	7.25	2.8						
		22.6	7.10	2.9						
4-Aug-11	20	22.4	7.01	2.9	96.8	32	36	0.08	J	
		22.4	6.92	2.9	97.3	30	40	0.07	J	
5-Aug-11	21	22.7	6.99	4.2						
		22.6	7.01	3.8						
6-Aug-11	22	22.5		2.8						
		22.6		3.0						
7-Aug-11	23	22.6		3.6						
		22.6		3.4						
8-Aug-11	24	22.4	7.00	3.7	96.3					
		22.4	6.95	3.4	93.1					
9-Aug-11	25	22.6		3.8						
		22.6		4.6						
10-Aug-11	26	22.3	7.04	3.8						
		22.4	7.00	3.9						
11-Aug-11	27	22.7		4.6						
		22.6		4.5						
12-Aug-11	28	22.7	7.54	3.2						
		22.7	7.39	3.2						
13-Aug-11	29	22.7		3.9						
		22.7		3.4						
14-Aug-11	30	22.7		3.3						
		22.7		4.2						
15-Aug-11	31	22.5	7.23	4.3	96.2					
		22.6	7.18	4.4	93.9					
16-Aug-11	32	22.8		4.4						
		22.8		4.2						
17-Aug-11	33	22.4	7.15	4.3						
		22.6	7.14	4.4						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.6		4.5						
		22.6		4.6						
19-Aug-11	35	22.6	7.14	4.1						
		22.6	7.21	3.9						
20-Aug-11	36	22.7		4.0						
		22.7		3.6						
21-Aug-11	37	22.8		4.6						
		22.8		4.3						
22-Aug-11	38	23.1	7.28	4.8	138.4					
		23.1	7.31	5.2	140.2					
23-Aug-11	39	23.3		4.3						
		23.3		4.1						
24-Aug-11	40	22.8	7.34	4.0						
		22.8	7.34	3.8						
25-Aug-11	41	23.1		4.1						
		23.2		4.2						
26-Aug-11	42	23.0	7.42	3.5						
		23.1	7.48	4.4						
27-Aug-11	43	23.1		3.2						
		23.0		2.8						
28-Aug-11	44	23.1		2.8						
		23.1		3.0						
29-Aug-11	45	23.6	7.44	3.9	258.4					
		23.6	7.40	3.1	257.4					
30-Aug-11	46	23.3		3.0						
		23.3		2.6						
31-Aug-11	47	23.0	7.60	5.1						
		23.0	7.48	3.3						
1-Sep-11	48	23.3		4.0						
		23.3		2.0						
2-Sep-11	49	22.8	7.31	3.7						
		22.8	7.35	3.8						
3-Sep-11	50	23.2		4.0						
		23.2		4.3						
4-Sep-11	51	23.0	7.16	3.0	251.3	102	116	0.00	U	
Sediment Ended		23.0	7.19	2.9	253.2					
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.15**	**3.7**	**135**	**51**	**58**	**0.48**		
Number		**104**	**48**	**94**	**20**	**4**	**4**	**4**		
Max #		**24.0**	**7.60**	**5.5**	**258**	**102**	**116**	**1.78**		
Min#		**22.1**	**6.49**	**1.7**	**93**	**30**	**36**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.1	6.99	5.4	107.6	42	36	1.80		
		23.1	6.92	5.4	99.6					
16-Jul-11	1	23.2								
		23.2								
17-Jul-11	2	23.1								
		23.0								
18-Jul-11	3	23.2	6.94	4.4	95.8					
		23.2	6.98	5.0	104.8					
19-Jul-11	4	23.1		4.0						
		23.1		3.7						
20-Jul-11	5	22.9	7.06	4.0						
		22.9	7.11	4.4						
21-Jul-11	6	23.1								
		23.2								
22-Jul-11	7	22.8	6.90	4.0						
		22.7	6.96	3.6						
23-Jul-11	8	23.0								
		23.1								
24-Jul-11	9	23.2								
		23.2								
25-Jul-11	10	23.0	6.56	3.3	100.7					
		23.0	6.51	3.6	116.1					
26-Jul-11	11	23.2		3.1						
		23.5		4.0						
27-Jul-01	12	22.8	6.99	3.8						
		22.8	7.09	3.4						
28-Jul-11	13	23.3		3.0						
		23.3		3.4						
29-Jul-11	14	23.2	7.21	4.6						
		22.8	7.33	4.4						
30-Jul-11	15	22.8		2.8						
		22.8		2.6						
31-Jul-11	16	23.3		4.4						
		23.4		4.2						
1-Aug-11	17	23.9	6.97	2.5	102.3					
		23.9	6.98	2.6	96.6					
2-Aug-11	18	22.2		2.4						
		22.2		2.0						
3-Aug-11	19	22.6	7.15	3.4						
		22.6	7.01	3.3						
4-Aug-11	20	22.5	6.88	4.2	90.3	32	48	0.08	J	
		22.5	6.94	3.3	96.4					
5-Aug-11	21	22.6	6.97	3.6						
		22.7	6.94	4.2						
6-Aug-11	22	22.6		3.0						
		22.6		2.9						
7-Aug-11	23	22.6		4.0						
		22.6		3.7						
8-Aug-11	24	22.4	7.03	3.9	100.0					
		22.4	6.96	3.7	95.2					
9-Aug-11	25	22.6		4.4						
		22.6		4.2						
10-Aug-11	26	22.4	7.06	4.2						
		22.4	7.01	3.0						
11-Aug-11	27	22.7		4.3						
		22.7		4.6						
12-Aug-11	28	22.7	7.12	3.4						
		22.8	7.06	3.8						
13-Aug-11	29	22.8		3.1						
		22.7		3.9						
14-Aug-11	30	22.8		3.5						
		22.8		3.6						
15-Aug-11	31	22.6	7.11	3.5	95.1					
		22.4	7.10	4.5	94.0					
16-Aug-11	32	22.8		3.9						
		22.8		4.2						
17-Aug-11	33	22.5	7.06	3.3						
		22.5	7.11	3.6						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.6		4.3						
		22.5		4.6						
19-Aug-11	35	22.6	7.05	3.3						
		22.6	7.10	3.3						
20-Aug-11	36	22.7		4.0						
		22.7		3.9						
21-Aug-11	37	22.8		4.1						
		22.9		4.3						
22-Aug-11	38	23.1	7.20	4.2	140.2					
		23.1	7.30	4.8	142.6					
23-Aug-11	39	23.3		4.2						
		23.3		4.5						
24-Aug-11	40	22.6	7.34	4.0						
		22.7	7.28	3.6						
25-Aug-11	41	23.1		4.5						
		23.1		4.5						
26-Aug-11	42	22.7	7.44	4.4						
		23.0	7.49	3.7						
27-Aug-11	43	23.1		4.0						
		23.1		3.5						
28-Aug-11	44	23.1		2.6						
		23.1		2.5						
29-Aug-11	45	23.6	7.40	3.3	260.2					
		23.6	7.44	3.5	266.4					
30-Aug-11	46	23.3		3.2						
		23.3		2.9						
31-Aug-11	47	23.0	7.47	3.5						
		23.1	7.42	3.0						
1-Sep-11	48	23.3		4.0						
		23.3		4.2						
2-Sep-11	49	22.8	7.48	3.7						
		22.9	7.45	4.2						
3-Sep-11	50	23.2		4.0						
		23.2		3.7						
4-Sep-11	51	23.0		4.0						
		23.0		3.4						
5-Sep-11	52	23.1	7.46	4.0	251.3					
		23.1	7.47	3.7	254.9					
6-Sep-11	53	23.1		3.4						
		23.1		3.9						
7-Sep-11	54	22.9	7.45	4.2						
		22.9	7.41	4.1						
8-Sep-11	55	22.8	7.45	4.2	248.7	100	120	0.10		
Sediment Ended		23.0	7.48	4.1	252.4					
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.15**	**3.8**	**146**	**58**	**68**	**0.66**		
Number		**112**	**52**	**102**	**22**	**3**	**3**	**3**		
Max #		**23.9**	**7.49**	**5.4**	**266**	**100**	**120**	**1.80**		
Min#		**22.2**	**6.51**	**2.0**	**90**	**32**	**36**	**0.08**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.2	6.93	5.4	109.5	42	44	1.80		
		23.2	6.95	5.5	108.3					
16-Jul-11	1	23.2								
		23.2								
17-Jul-11	2	23.0								
		23.1								
18-Jul-11	3	23.2	6.97	5.2	97.9					
		23.2	6.95	4.4	103.4					
19-Jul-11	4	23.1		4.2						
		23.1		4.2						
20-Jul-11	5	23.0	7.13	4.1						
		22.9	7.02	3.5						
21-Jul-11	6	23.2								
		23.2								
22-Jul-11	7	22.8	6.93	3.7						
		22.8	7.00	3.4						
23-Jul-11	8	23.1								
		23.1								
24-Jul-11	9	23.2								
		23.3								
25-Jul-11	10	23.0	6.42	2.6	108.2					
		23.0	6.54	3.2	110.9					
26-Jul-11	11	23.2		2.1						
		23.5		2.2						
27-Jul-01	12	22.8	7.10	4.2						
		22.9	6.91	3.2						
28-Jul-11	13	23.3		3.4						
		23.3		4.0						
29-Jul-11	14	23.2	7.05	4.5						
		23.0	7.08	4.9						
30-Jul-11	15	23.0		3.4						
		23.0		2.7						
31-Jul-11	16	23.3		4.1						
		23.5		4.0						
1-Aug-11	17	23.9	7.03	3.3	93.5					
		23.9	7.04	2.8	102.8					
2-Aug-11	18	22.2		2.2						
		22.3		2.4						
3-Aug-11	19	22.7	7.07	3.5						
		22.7	7.06	3.1						
4-Aug-11	20	22.6	6.84	3.8	91.7	32	48	0.07	J	
		22.6	6.94	3.6	94.0					
5-Aug-11	21	22.6	6.98	3.7						
		22.6	7.04	3.5						
6-Aug-11	22	22.6		3.4						
		22.6		3.5						
7-Aug-11	23	22.6		4.0						
		22.6		4.0						
8-Aug-11	24	22.4	6.96	3.9	96.8					
		22.4	7.01	4.4	96.6					
9-Aug-11	25	22.6		5.3						
		22.5		5.0						
10-Aug-11	26	22.4	7.12	4.0						
		22.4	7.08	4.3						
11-Aug-11	27	22.7		4.9						
		22.7		4.9						
12-Aug-11	28	22.7	7.06	4.0						
		22.8	7.02	4.2						
13-Aug-11	29	22.7		3.5						
		22.7		4.0						
14-Aug-11	30	22.8		4.5						
		22.8		4.6						
15-Aug-11	31	22.3	7.10	4.3	95.1					
		22.3	7.08	4.3	94.9					
16-Aug-11	32	22.8		4.5						
		22.9		4.8						
17-Aug-11	33	22.5	7.12	3.9						
		22.5	7.14	4.3						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.6		4.7						
		22.6		4.4						
19-Aug-11	35	22.6	7.11	3.0						
		22.6	7.17	2.9						
20-Aug-11	36	22.7		3.6						
		22.7		3.7						
21-Aug-11	37	22.8		4.1						
		22.8		4.4						
22-Aug-11	38	23.1	7.29	5.3	146.1					
		23.1	7.41	5.1	148.2					
23-Aug-11	39	23.3		4.8						
		23.3		4.2						
24-Aug-11	40	22.5	7.35	4.5						
		22.6	7.34	4.4						
25-Aug-11	41	23.2		4.2						
		23.2		4.7						
26-Aug-11	42	23.2	7.61	5.3						
		23.2	7.55	4.8						
27-Aug-11	43	23.1		3.7						
		23.1		4.0						
28-Aug-11	44	23.1		3.4						
		23.1		2.6						
29-Aug-11	45	23.6	7.51	4.2	260.2					
		23.6	7.45	3.5	259.4					
30-Aug-11	46	23.3		3.3						
		23.3		3.8						
31-Aug-11	47	23.1	7.50	3.9						
		23.1	7.44	3.3						
1-Sep-11	48	23.3		4.3						
		23.3		4.7						
2-Sep-11	49	22.9	7.53	4.2						
		23.0	7.47	4.3						
3-Sep-11	50	23.2		4.6						
		23.2		4.4						
4-Sep-11	51	23.0	7.45	4.4	257.4	98	128	0.00	U	
Sediment Ended		23.0	7.48	4.4	263.4					
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.13**	**4.0**	**137**	**57**	**73**	**0.62**		
Number		**104**	**48**	**94**	**20**	**3**	**3**	**3**		
Max #		**23.9**	**7.61**	**5.5**	**263**	**98**	**128**	**1.80**		
Min#		**22.2**	**6.42**	**2.1**	**92**	**32**	**44**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.2	7.00	5.7	112.3	44	48	1.75		
		23.2	7.05	5.8	115.2	DUP=44	DUP=44	DUP=1.77		
16-Jul-11	1	23.2								
		23.2								
17-Jul-11	2	23.1								
		23.2								
18-Jul-11	3	23.2	6.99	5.2	96.5					
		23.3	6.99	5.0	100.0					
19-Jul-11	4	23.1		4.2						
		23.1		4.4						
20-Jul-11	5	23.0	7.00	3.7						
		23.0	7.06	3.6						
21-Jul-11	6	23.2								
		23.2								
22-Jul-11	7	22.8	7.07	3.9						
		22.8	7.10	3.7						
23-Jul-11	8	23.1								
		23.1								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	23.0	6.57	3.5	112.4					
		23.0	6.50	2.6	109.0					
26-Jul-11	11	23.2		2.2						
		23.4		5.6						
27-Jul-01	12	22.9	6.98	2.9						
		23.0	6.99	2.8						
28-Jul-11	13	23.3		3.5						
		23.3		3.5						
29-Jul-11	14	23.2	7.07	4.5						
		23.0	7.00	4.6						
30-Jul-11	15	23.0		3.1						
		23.0		3.6						
31-Jul-11	16	23.4		4.9						
		23.6		4.5						
1-Aug-11	17	23.9	7.15	2.9	108.0					
		23.9	7.20	3.1	110.9					
2-Aug-11	18	22.3		2.5						
		22.3		2.7						
3-Aug-11	19	22.6	7.11	3.9						
		22.7	7.14	4.0						
4-Aug-11	20	22.6	7.02	4.1	90.3	32	48	0.05	J	
		22.6	7.15	4.5	92.5					
5-Aug-11	21	22.6	7.05	4.6						
		22.7	7.04	5.0						
6-Aug-11	22	22.7		3.7						
		22.7		3.2						
7-Aug-11	23	22.6		5.0						
		22.6		4.7						
8-Aug-11	24	22.4	7.03	4.5	97.4					
		22.4	7.12	4.5	101.1					
9-Aug-11	25	22.6		5.5						
		22.6		4.4						
10-Aug-11	26	22.4	7.10	4.4						
		22.4	7.18	4.6						
11-Aug-11	27	22.7		5.1						
		22.7		5.3						
12-Aug-11	28	22.7	7.04	3.9						
		22.8	7.04	4.4						
13-Aug-11	29	22.8		4.2						
		22.8		4.2						
14-Aug-11	30	22.9		5.1						
		22.8		4.3						
15-Aug-11	31	22.4	7.09	4.4	95.7					
		22.5	7.08	4.5	95.6					
16-Aug-11	32	22.8		4.7						
		22.9		4.6						
17-Aug-11	33	22.5	7.11	3.6						
		22.6	7.17	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.7		4.4						
		22.7		4.5						
19-Aug-11	35	22.6	7.24	3.5						
		22.6	7.22	3.7						
20-Aug-11	36	22.7		3.6						
		22.7		3.9						
21-Aug-11	37	22.9		4.4						
		22.9		4.6						
22-Aug-11	38	23.1	7.18	5.2	144.5					
		23.1	7.16	4.4	142.9					
23-Aug-11	39	23.3		4.5						
		23.3		4.4						
24-Aug-11	40	23.1	7.38	4.2						
		23.2	7.42	4.5						
25-Aug-11	41	23.1		5.1						
		23.1		4.6						
26-Aug-11	42	23.2	7.58	4.8						
		23.2	7.56	4.9						
27-Aug-11	43	23.1		3.5						
		23.1		4.5						
28-Aug-11	44	23.1		2.9						
		23.2		2.5						
29-Aug-11	45	23.6	7.41	3.5	261.7					
		23.6	7.41	3.6	258.2					
30-Aug-11	46	23.3		3.1						
		23.3		3.0						
31-Aug-11	47	23.1	7.52	4.1						
		23.1	7.52	4.5						
1-Sep-11	48	23.3		4.8						
		23.3		4.6						
2-Sep-11	49	22.8	7.52	4.7						
		22.8	7.56	4.9						
3-Sep-11	50	23.2		4.7						
		23.2		4.7						
4-Sep-11	51	22.8		4.0						
		22.8		4.0						
5-Sep-11	52	23.1	7.53	4.2	262.3					
		23.1	7.57	4.2	258.0					
6-Sep-11	53	23.2		3.6						
		23.2		4.5						
7-Sep-11	54	22.8	7.54	5.1						
		22.8	7.50	4.8						
8-Sep-11	55	23.0	7.48	4.3	254.4	100	116	0.02	U	
Sediment Ended		23.0	7.49	4.4	251.9					
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.19**	**4.2**	**149**	**57**	**71**	**0.32**		
Number		**112**	**52**	**102**	**22**	**3**	**3**	**3**		
Max #		**23.9**	**7.58**	**5.8**	**262**	**100**	**116**	**0.90**		
Min#		**22.3**	**6.50**	**2.2**	**90**	**32**	**48**	**0.02**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.2	7.09	5.9	115.4	40	44	1.75		
		23.2	7.10	5.9	119.1					
16-Jul-11	1	23.2								
		23.2								
17-Jul-11	2	23.2								
		23.2								
18-Jul-11	3	23.3	7.00	5.4	99.4					
		23.2	7.01	5.0	99.0					
19-Jul-11	4	23.1		4.5						
		23.1		4.3						
20-Jul-11	5	23.0	7.10	3.7						
		23.0	7.08	4.2						
21-Jul-11	6	23.2								
		23.1								
22-Jul-11	7	22.8	7.04	3.6						
		22.8	7.10	3.9						
23-Jul-11	8	23.2								
		23.2								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	23.1	6.53	3.6	102.4					
		23.1	6.70	4.0	110.1					
26-Jul-11	11	23.2		2.9						
		23.3		3.6						
27-Jul-01	12	22.9	7.12	4.3						
		22.9	6.90	2.9						
28-Jul-11	13	23.1		3.7						
		23.1		3.5						
29-Jul-11	14	23.2	7.03	5.1						
		23.0	7.12	5.3						
30-Jul-11	15	23.1		3.6						
		23.1		3.8						
31-Jul-11	16	23.3		5.2						
		23.5		5.3						
1-Aug-11	17	23.9	7.25	3.1	104.3					
		23.9	7.30	3.8	103.2					
2-Aug-11	18	22.4		2.7						
		22.4		2.9						
3-Aug-11	19	22.8	7.15	4.2						
		22.8	7.16	4.7						
4-Aug-11	20	22.6	7.11	4.0	96.3	34	48	0.04	J	
		22.5	7.17	4.4	96.7					
5-Aug-11	21	22.6	7.09	4.5						
		22.6	7.06	4.6						
6-Aug-11	22	22.7		4.2						
		22.6		4.0						
7-Aug-11	23	22.6		5.4						
		22.6		5.1						
8-Aug-11	24	22.4	7.14	4.7	100.5					
		22.4	7.10	4.6	99.3					
9-Aug-11	25	22.5		5.3						
		22.6		5.2						
10-Aug-11	26	22.4	6.91	3.9						
		22.4	6.95	3.7						
11-Aug-11	27	22.7		5.0						
		22.7		4.9						
12-Aug-11	28	22.7	7.07	4.6						
		22.7	7.07	4.4						
13-Aug-11	29	22.8		4.2						
		22.7		4.6						
14-Aug-11	30	22.8		4.5						
		22.8		4.1						
15-Aug-11	31	22.4	7.17	4.9	99.0					
		22.4	7.21	4.5	102.5					
16-Aug-11	32	22.8		4.7						
		22.8		4.9						
17-Aug-11	33	22.4	7.22	4.9						
		22.6	7.21	4.7						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.7		4.2						
		22.8		4.6						
19-Aug-11	35	22.6	7.28	4.5						
		22.6	7.23	3.5						
20-Aug-11	36	22.7		4.0						
		22.7		4.1						
21-Aug-11	37	22.9		4.4						
		22.8		4.2						
22-Aug-11	38	23.1	7.35	5.5	143.1					
		23.1	7.28	5.1	147.9					
23-Aug-11	39	23.3		4.8						
		23.3		4.6						
24-Aug-11	40	23.1	7.27	4.6						
		23.2	7.35	4.4						
25-Aug-11	41	23.1		5.2						
		23.2		5.8						
26-Aug-11	42	23.1	7.54	4.5						
		23.2	7.51	3.8						
27-Aug-11	43	23.1		4.1						
		23.0		4.2						
28-Aug-11	44	23.2		1.3						
		23.2		2.5						
29-Aug-11	45	23.7	7.56	4.2	266.0					
		23.7	7.53	4.2	261.5					
30-Aug-11	46	23.3		2.6						
		23.3		3.4						
31-Aug-11	47	23.1	7.53	3.4						
		23.1	7.52	3.6						
1-Sep-11	48	23.3		4.1						
		23.3		4.0						
2-Sep-11	49	23.0	7.54	4.7						
		22.9	7.54	4.5						
3-Sep-11	50	23.2		4.6						
		23.2		5.0						
4-Sep-11	51	22.8		4.0						
		22.8		3.9						
5-Sep-11	52	23.0	7.54	4.4	262.7					
		23.1	7.53	4.7	262.9					
6-Sep-11	53	23.1		2.7						
		23.2		4.2						
7-Sep-11	54	22.4	7.51	4.1						
		22.7	7.48	4.0						
8-Sep-11	55	22.8		3.4						
		22.9		5.2						
9-Sep-11	56	22.6	7.62	4.5						
		22.7	7.66	4.2						
10-Sep-11	57	22.8		4.3						
		22.8		3.9						
11-Sep-11	58	23.1	7.83	6.7	259.0	114	120	0.00	U	
Sediment Ended		22.9	7.57	3.8	253.0					
		23.0	7.64	4.5	259.0					

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.25**	**4.3**	**155**	**63**	**71**	**0.60**		
Number		**119**	**55**	**109**	**23**	**3**	**3**	**3**		
Max #		**23.9**	**7.83**	**6.7**	**266**	**114**	**120**	**1.75**		
Min#		**22.4**	**6.53**	**1.3**	**96**	**34**	**44**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.2	7.18	6.0	115.1	42	40	1.59		
		23.2	7.18	6.1	118.3					
16-Jul-11	1	23.2								
		23.2								
17-Jul-11	2	23.1								
		23.1								
18-Jul-11	3	23.2	7.05	5.2	95.7					
		23.2	7.03	5.2	97.7					
19-Jul-11	4	23.1		4.4						
		23.1		4.3						
20-Jul-11	5	22.8	7.11	4.2						
		22.7	7.06	3.8						
21-Jul-11	6	23.2								
		23.2								
22-Jul-11	7	22.8	7.16	3.6						
		22.8	7.07	3.6						
23-Jul-11	8	23.2								
		23.2								
24-Jul-11	9	23.2								
		23.2								
25-Jul-11	10	23.1	6.63	2.5	109.7					
		23.0	6.62	2.2	110.8					
26-Jul-11	11	23.2		3.0						
		23.3		3.0						
27-Jul-01	12	22.8	7.02	4.0						
		22.8	7.15	4.2						
28-Jul-11	13	23.1		4.0						
		23.2		4.0						
29-Jul-11	14	23.2	7.13	5.0						
		23.0	7.11	5.0						
30-Jul-11	15	23.1		5.0						
		23.1		4.8						
31-Jul-11	16	23.3		5.5						
		23.4		5.5						
1-Aug-11	17	23.9	7.42	4.2	107.1					
		23.9	7.26	3.7	102.1					
2-Aug-11	18	22.4		3.4						
		22.5		3.1						
3-Aug-11	19	22.8	7.18	4.2						
		22.8	7.18	4.7						
4-Aug-11	20	22.6	7.33	4.6	101.7	34	40	0.02	U	
		22.6	7.24	4.9	96.0					
5-Aug-11	21	22.7	7.15	4.7						
		22.7	7.12	4.5						
6-Aug-11	22	22.6		4.3						
		22.5		4.5						
7-Aug-11	23	22.6		5.6						
		22.6		5.5						
8-Aug-11	24	22.4	7.22	4.6	105.0					
		22.4	7.21	5.2	100.1					
9-Aug-11	25	22.6		5.6						
		22.6		5.7						
10-Aug-11	26	22.4	7.17	4.6						
		22.4	7.16	4.8						
11-Aug-11	27	22.7		5.5						
		22.7		5.1						
12-Aug-11	28	22.7	7.08	4.5						
		22.6	7.03	4.7						
13-Aug-11	29	22.7		4.4						
		22.7		4.1						
14-Aug-11	30	22.8		4.9						
		22.8		5.0						
15-Aug-11	31	22.3	6.88	4.9	97.6					
		22.6	6.95	4.5	98.2					
16-Aug-11	32	22.8		5.0						
		22.8		4.9						
17-Aug-11	33	22.7	6.98	4.5						
		22.7	7.08	4.2						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.8		4.7						
		22.7		4.5						
19-Aug-11	35	22.6	7.29	4.3						
		22.6	7.35	3.8						
20-Aug-11	36	22.7		4.1						
		22.8		4.2						
21-Aug-11	37	22.9		4.8						
		22.8		4.5						
22-Aug-11	38	23.1	7.43	6.0	147.4					
		23.1	7.36	5.5	144.6					
23-Aug-11	39	23.2		4.8						
		23.2		4.6						
24-Aug-11	40	23.2	7.43	5.0						
		23.2	7.45	4.6						
25-Aug-11	41	23.2		5.1						
		23.2		5.4						
26-Aug-11	42	23.1	7.63	5.1						
		23.2	7.53	4.8						
27-Aug-11	43	23.1		4.9						
		23.0		4.2						
28-Aug-11	44	23.2		1.9						
		23.1		1.5						
29-Aug-11	45	23.7	7.59	4.6	264.9					
		23.7	7.58	4.0	266.1					
30-Aug-11	46	23.3		3.4						
		23.3		2.8						
31-Aug-11	47	23.1	7.50	3.0						
		23.1	7.50	3.3						
1-Sep-11	48	23.3		5.1						
		23.3		5.4						
2-Sep-11	49	22.9	7.64	5.0						
		23.0	7.60	4.9						
3-Sep-11	50	23.2		4.7						
		23.1		4.9						
4-Sep-11	51	22.8		4.4						
		22.8		4.1						
5-Sep-11	52	23.1	7.56	4.5	269.9					
		23.1	7.58	4.7	262.3					
6-Sep-11	53	23.1		6.5						
		23.2		5.0						
7-Sep-11	54	22.8	7.47	4.9						
		22.9	7.63	5.2						
8-Sep-11	55	23.0		5.3						
		23.0		6.1						
9-Sep-11	56	22.5	7.66	5.0						
		22.7	7.66	4.6						
10-Sep-11	57	22.8		4.5						
		22.9		5.0						
11-Sep-11	58	23.2	7.79	6.6	259.0	108	120	0.00	U	
Sediment Ended		22.8	7.64	3.8	261.0					
		23.0	7.67	4.3	258.0					

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 0.5 (GLC No. 8982) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.29**	**4.6**	**156**	**61**	**67**	**0.54**		
Number		**119**	**55**	**109**	**23**	**3**	**3**	**3**		
Max #		**23.9**	**7.79**	**6.6**	**270**	**108**	**120**	**1.59**		
Min#		**22.3**	**6.62**	**1.5**	**96**	**34**	**40**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.0	6.92	5.1	109.3	38	36	1.98		
		23.1	6.88	4.9	110.4					
16-Jul-11	1	23.1								
		23.1								
17-Jul-11	2	23.2								
		23.2								
18-Jul-11	3	23.1	6.88	4.6	95.3					
		23.1	6.90	4.6	94.6					
19-Jul-11	4	23.1		4.1						
		23.1		4.2						
20-Jul-11	5	22.7	6.83	3.4						
		22.7	6.88	3.4						
21-Jul-11	6	23.2								
		23.2								
22-Jul-11	7	22.8	7.00	3.7						
		22.8	7.01	3.6						
23-Jul-11	8	23.2								
		23.2								
24-Jul-11	9	23.2								
		23.2								
25-Jul-11	10	22.9	6.94	3.0	103.0					
		22.9	6.88	2.4	108.0					
26-Jul-11	11	23.2		4.5						
		23.2		2.2						
27-Jul-01	12	22.7	6.79	2.6						
		22.8	6.97	3.1						
28-Jul-11	13	23.0		4.0						
		22.9		2.6						
29-Jul-11	14	23.2	6.87	4.1						
		23.0	6.91	4.4						
30-Jul-11	15	23.1		3.4						
		23.1		4.1						
31-Jul-11	16	23.3		4.4						
		23.4		4.5						
1-Aug-11	17	23.7	6.91	2.7	101.4					
		23.8	6.98	2.8	97.4					
2-Aug-11	18	22.8		2.7						
		22.6		2.1						
3-Aug-11	19	22.7	6.99	3.2						
		22.9	6.88	3.1						
4-Aug-11	20	22.6	6.89	2.9	93.2	32	44	0.07	J	
		22.6	6.95	2.7	96.1					
5-Aug-11	21	22.5	6.85	3.0						
		22.6	6.80	3.1						
6-Aug-11	22	22.5		2.7						
		22.6		2.4						
7-Aug-11	23	22.8		4.0						
		22.7		3.9						
8-Aug-11	24	22.3	6.91	3.8	92.8					
		22.3	6.94	3.2	97.6					
9-Aug-11	25	22.5		4.2						
		22.6		3.8						
10-Aug-11	26	22.4	6.97	3.7						
		22.4	6.97	3.9						
11-Aug-11	27	22.6		3.9						
		22.6		3.9						
12-Aug-11	28	22.6	6.91	3.0						
		22.6	6.85	3.1						
13-Aug-11	29	22.7		3.3						
		22.7		3.8						
14-Aug-11	30	22.7		3.8						
		22.8		3.5						
15-Aug-11	31	22.4	6.87	4.2	94.6					
		22.5	6.93	4.0	97.2					
16-Aug-11	32	22.8		4.9						
		22.8		4.6						
17-Aug-11	33	22.6	7.06	3.9						
		22.7	7.11	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.7		4.0						
		22.7		4.1						
19-Aug-11	35	22.6	7.15	3.4						
		22.6	7.20	3.6						
20-Aug-11	36	22.7		3.4						
		22.7		3.5						
21-Aug-11	37	22.7		3.9						
		22.8		3.6						
22-Aug-11	38	23.1	7.30	4.0	145.9					
		23.1	7.27	5.0	142.7					
23-Aug-11	39	23.2		4.4						
		23.2		4.6						
24-Aug-11	40	23.1	7.43	3.7						
		23.2	7.36	4.0						
25-Aug-11	41	23.1		4.6						
		23.2		4.8						
26-Aug-11	42	23.2	7.52	5.0						
		23.2	7.43	4.0						
27-Aug-11	43	23.0		3.5						
		23.1		3.4						
28-Aug-11	44	23.1		2.5						
		23.1		2.5						
29-Aug-11	45	23.6	7.30	4.2	262.2					
		23.6	7.27	4.4	260.2					
30-Aug-11	46	23.2		2.8						
		23.2		2.5						
31-Aug-11	47	22.8	7.46	3.2						
		22.8	7.46	3.0						
1-Sep-11	48	23.3		4.1						
		23.3		4.7						
2-Sep-11	49	23.1	7.58	4.5						
		23.1	7.52	5.0						
3-Sep-11	50	23.3	7.56	4.0	250.6	100	128	0.03	U	
Sediment Ended		23.2	7.49	3.9	256.2					
4-Sep-11	51									
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.08**	**3.7**	**135**	**57**	**69**	**0.69**		
Number		**102**	**48**	**92**	**20**	**3**	**3**	**3**		
Max #		**23.8**	**7.58**	**5.1**	**262**	**100**	**128**	**1.98**		
Min#		**22.3**	**6.79**	**2.1**	**93**	**32**	**36**	**0.03**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.0	6.88	4.9	111.8	38	36	2.01		
		23.1	6.92	4.8	114.3					
16-Jul-11	1	23.1								
		23.1								
17-Jul-11	2	23.2								
		23.1								
18-Jul-11	3	23.1	6.92	4.6	99.7					
		23.1	6.90	4.4	97.0					
19-Jul-11	4	23.1		3.9						
		23.0		3.8						
20-Jul-11	5	22.7	6.92	3.4						
		22.8	6.95	3.2						
21-Jul-11	6	23.2								
		23.2								
22-Jul-11	7	22.8	7.01	4.0						
		22.8	7.04	4.1						
23-Jul-11	8	23.2								
		23.2								
24-Jul-11	9	23.2								
		23.2								
25-Jul-11	10	22.9	6.95	3.4	104.1					
		22.9	6.98	3.6	104.7					
26-Jul-11	11	23.2		2.2						
		23.2		2.1						
27-Jul-01	12	22.8	7.02	3.3						
		22.8	6.89	3.4						
28-Jul-11	13	22.8		4.1						
		22.9		2.7						
29-Jul-11	14	23.1	6.92	4.0						
		22.9	6.90	3.9						
30-Jul-11	15	23.0		3.3						
		22.9		2.8						
31-Jul-11	16	23.3		4.2						
		23.4		4.5						
1-Aug-11	17	23.7	6.97	2.5	96.6					
		23.8	6.95	3.0	98.8					
2-Aug-11	18	22.6		3.1						
		22.5		2.4						
3-Aug-11	19	22.8	6.92	3.2						
		22.8	7.00	3.1						
4-Aug-11	20	22.7	6.93	3.0	90.7	30	44	0.07	J	
		22.6	6.98	3.4	92.4					
5-Aug-11	21	22.6	6.92	3.4						
		22.6	6.88	3.2						
6-Aug-11	22	22.5		2.4						
		22.5		3.5						
7-Aug-11	23	22.7		4.0						
		22.7		4.2						
8-Aug-11	24	22.3	6.96	3.7	97.0					
		22.3	6.95	3.8	95.0					
9-Aug-11	25	22.6		4.1						
		22.5		4.2						
10-Aug-11	26	22.4	6.99	3.2						
		22.4	6.98	3.6						
11-Aug-11	27	22.5		4.5						
		22.5		4.1						
12-Aug-11	28	22.6	6.92	3.0						
		22.6	6.93	3.2						
13-Aug-11	29	22.7		4.2						
		22.7		3.8						
14-Aug-11	30	22.8		3.4						
		22.8		3.5						
15-Aug-11	31	22.4	6.95	4.3	96.1					
		22.6	6.96	4.1	95.2					
16-Aug-11	32	22.7		4.2						
		22.7		4.4						
17-Aug-11	33	22.6	7.09	3.8						
		22.6	7.12	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.6		4.2						
		22.7		4.1						
19-Aug-11	35	22.6	7.08	3.0						
		22.6	6.99	3.5						
20-Aug-11	36	22.7		3.7						
		22.8		3.5						
21-Aug-11	37	22.7		4.2						
		22.8		3.5						
22-Aug-11	38	23.1	7.29	4.6	146.0					
		23.1	7.33	4.6	143.0					
23-Aug-11	39	23.2		4.0						
		23.2		4.4						
24-Aug-11	40	23.1	7.27	4.0						
		23.1	7.32	3.9						
25-Aug-11	41	23.0		4.2						
		23.1		5.0						
26-Aug-11	42	23.2	7.50	4.3						
		23.2	7.44	4.0						
27-Aug-11	43	23.1		3.6						
		23.1		2.8						
28-Aug-11	44	23.1		4.3						
		23.1		3.7						
29-Aug-11	45	23.6	7.39	3.9	260.5					
		23.6	7.41	3.8	257.7					
30-Aug-11	46	23.2		4.2						
		23.2		4.4						
31-Aug-11	47	22.8	7.55	4.3						
		22.8	7.47	3.7						
1-Sep-11	48	23.3		3.2						
		23.3		3.2						
2-Sep-11	49	23.1	7.59	5.0						
		23.1	7.56	4.7						
3-Sep-11	50	23.1	7.49	4.7	261.1	100	116	0.02	U	
Sediment Ended		23.2	7.51	4.1	259.4					
4-Sep-11	51									
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.10**	**3.8**	**136**	**56**	**65**	**0.70**		
Number		**102**	**48**	**92**	**20**	**3**	**3**	**3**		
Max #		**23.8**	**7.59**	**5.0**	**261**	**100**	**116**	**2.01**		
Min#		**22.3**	**6.88**	**2.1**	**91**	**30**	**36**	**0.02**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.1	6.94	4.8	114.9	40	40	1.88		
		23.1	7.01	5.2	114.8					
16-Jul-11	1	23.1								
		23.0								
17-Jul-11	2	23.1								
		23.0								
18-Jul-11	3	23.1	6.93	4.4	100.0					
		23.1	6.96	4.2	102.2					
19-Jul-11	4	23.0		3.8						
		23.0		3.8						
20-Jul-11	5	22.7	7.00	3.4						
		22.7	7.02	3.4						
21-Jul-11	6	23.0								
		23.0								
22-Jul-11	7	22.8	7.08	4.1						
		22.8	7.05	4.0						
23-Jul-11	8	23.2								
		23.1								
24-Jul-11	9	23.2								
		23.2								
25-Jul-11	10	22.9	7.11	2.4	124.0					
		22.9	7.03	3.4	106.4					
26-Jul-11	11	23.2		2.5						
		23.2		3.0						
27-Jul-01	12	22.8	7.00	3.3						
		22.8	7.04	3.8						
28-Jul-11	13	22.9		3.9						
		23.0		3.2						
29-Jul-11	14	23.1	6.94	4.2						
		22.9	6.92	4.0						
30-Jul-11	15	22.9		3.4						
		22.8		3.5						
31-Jul-11	16	23.3		4.8						
		23.4		4.7						
1-Aug-11	17	23.6	6.97	3.1	99.7					
		23.6	6.85	3.1	91.9					
2-Aug-11	18	22.5		1.7						
		22.4		2.7						
3-Aug-11	19	22.8	7.01	3.3						
		22.8	6.94	3.7						
4-Aug-11	20	22.6	6.96	3.3	93.3	32	40	0.06	J	
		22.5	6.92	3.4	91.6					
5-Aug-11	21	22.5	6.92	3.2						
		22.6	6.93	3.4						
6-Aug-11	22	22.5		2.7						
		22.5		3.1						
7-Aug-11	23	22.7		4.4						
		22.7		4.3						
8-Aug-11	24	22.2	6.96	4.0	96.2					
		22.3	6.98	3.6	95.8					
9-Aug-11	25	22.5		4.2						
		22.5		3.7						
10-Aug-11	26	22.4	7.03	3.9						
		22.4	7.01	3.8						
11-Aug-11	27	22.5		4.1						
		22.5		4.2						
12-Aug-11	28	22.8	6.91	3.2						
		22.7	6.96	3.6						
13-Aug-11	29	22.7		3.6						
		22.6		3.6						
14-Aug-11	30	22.8		4.0						
		22.8		3.3						
15-Aug-11	31	22.4	6.99	4.3	97.2					
		22.5	7.07	4.1	102.7					
16-Aug-11	32	22.7		5.0						
		22.7		4.6						
17-Aug-11	33	22.5	7.17	4.3						
		22.6	7.10	4.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.5		4.3						
		22.5		4.2						
19-Aug-11	35	22.4	7.20	3.4						
		22.4	7.19	3.5						
20-Aug-11	36	22.8		3.8						
		22.8		3.9						
21-Aug-11	37	22.7		4.1						
		22.7		3.9						
22-Aug-11	38	23.1	7.13	4.0	145.2					
		23.1	7.23	4.6	153.7					
23-Aug-11	39	23.1		4.2						
		23.2		4.4						
24-Aug-11	40	23.0	7.25	4.0						
		23.1	7.31	3.9						
25-Aug-11	41	23.1		4.7						
		23.2		3.3						
26-Aug-11	42	23.2	7.64	4.0						
		23.1	7.49	4.7						
27-Aug-11	43	23.1		3.5						
		23.1		4.2						
28-Aug-11	44	23.1		3.9						
		23.1		1.9						
29-Aug-11	45	23.6	7.53	3.5	270.5					
		23.6	7.53	3.0	265.5					
30-Aug-11	46	23.2		4.4						
		23.2		4.0						
31-Aug-11	47	22.8	7.64	4.2						
		22.8	7.43	2.5						
1-Sep-11	48	23.3		4.6						
		23.3		4.1						
2-Sep-11	49	23.1	7.70	4.4						
		23.1	7.69	4.7						
3-Sep-11	50	23.1		3.4						
		23.1		3.9						
4-Sep-11	51	22.9	7.63	3.1	271.6	108	144	0.00	U	
Sediment Ended		22.8	7.60	3.1	287.8	104	140	0.00	U	
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.14**	**3.8**	**141**	**71**	**91**	**0.49**		
Number		**104**	**48**	**94**	**20**	**4**	**4**	**4**		
Max #		**23.6**	**7.70**	**5.2**	**288**	**108**	**144**	**1.88**		
Min#		**22.2**	**6.85**	**1.7**	**92**	**32**	**40**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.1	7.05	5.2	115.2	42	40	1.71		
		23.1	7.03	5.1	114.1					
16-Jul-11	1	22.9								
		23.0								
17-Jul-11	2	23.0								
		23.0								
18-Jul-11	3	23.1	6.99	4.4	99.0					
		23.0	7.01	4.6	98.7					
19-Jul-11	4	23.0		4.2						
		23.0		3.6						
20-Jul-11	5	22.8	7.04	3.0						
		22.7	7.05	3.4						
21-Jul-11	6	22.9								
		22.8								
22-Jul-11	7	22.8	7.16	3.7						
		22.8	7.18	4.1						
23-Jul-11	8	23.1								
		23.0								
24-Jul-11	9	23.1								
		23.2								
25-Jul-11	10	22.9	7.10	3.4	117.3					
		22.8	7.04	2.8	110.6					
26-Jul-11	11	23.2		2.2						
		23.2		2.3						
27-Jul-01	12	22.7	7.02	3.3						
		22.8	7.00	3.6						
28-Jul-11	13	23.2		3.4						
		23.2		2.8						
29-Jul-11	14	23.0	6.99	4.2						
		22.8	7.01	4.2						
30-Jul-11	15	22.8		3.6						
		22.7		3.8						
31-Jul-11	16	23.3		4.5						
		23.4		4.8						
1-Aug-11	17	23.6	6.97	3.7	96.1					
		23.6	7.01	3.1	97.1					
2-Aug-11	18	22.3		2.7						
		22.2		2.3						
3-Aug-11	19	22.8	7.07	3.7						
		22.8	7.02	3.5						
4-Aug-11	20	22.5	6.93	4.1	90.5	30	44	0.06	J	
		22.6	6.97	3.7	93.7					
5-Aug-11	21	22.5	6.93	3.9						
		22.6	6.90	3.7						
6-Aug-11	22	22.5		2.6						
		22.6		3.0						
7-Aug-11	23	22.7		4.1						
		22.6		4.5						
8-Aug-11	24	22.3	7.09	3.7	101.3					
		22.3	7.06	3.6	97.5					
9-Aug-11	25	22.5		4.2						
		22.5		4.4						
10-Aug-11	26	22.4	6.96	4.0						
		22.4	7.10	3.7						
11-Aug-11	27	22.5		4.1						
		22.5		4.2						
12-Aug-11	28	22.7	6.95	3.6						
		22.7	6.93	3.4						
13-Aug-11	29	22.6		4.2						
		22.6		3.9						
14-Aug-11	30	22.7		4.1						
		22.8		4.0						
15-Aug-11	31	22.5	7.04	4.7	96.3					
		22.4	7.01	4.0	98.3					
16-Aug-11	32	22.6		3.9						
		22.7		3.8						
17-Aug-11	33	22.3	7.18	4.9						
		22.4	7.19	5.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.5		4.1						
		22.6		4.0						
19-Aug-11	35	22.4	7.30	3.0						
		22.4	7.37	3.1						
20-Aug-11	36	22.8		4.2						
		22.8		4.0						
21-Aug-11	37	22.7		4.0						
		22.6		4.1						
22-Aug-11	38	23.1	7.25	5.0	146.7					
		23.1	7.33	5.1	148.2					
23-Aug-11	39	23.2		4.0						
		23.1		4.3						
24-Aug-11	40	23.0	7.63	4.0						
		23.0	7.43	4.0						
25-Aug-11	41	23.0		4.1						
		23.1		4.7						
26-Aug-11	42	23.3	7.57	4.0						
		23.2	7.49	4.0						
27-Aug-11	43	23.0		3.3						
		23.0		3.9						
28-Aug-11	44	23.1		3.3						
		23.1		3.3						
29-Aug-11	45	23.6	7.47	3.0	267.1					
		23.6	7.47	3.2	263.1					
30-Aug-11	46	23.1		3.5						
		23.2		3.5						
31-Aug-11	47	22.8	7.66	3.5						
		22.8	7.59	3.4						
1-Sep-11	48	23.3		3.0						
		23.3		3.7						
2-Sep-11	49	23.1	7.59	4.5						
		23.0	7.63	4.1						
3-Sep-11	50	23.1		4.2						
		23.1		4.7						
4-Sep-11	51	22.8		2.9						
		22.8		3.3						
5-Sep-11	52	23.0	7.59	3.7	265.0					
		23.0	7.54	3.7	272.4					
6-Sep-11	53	23.0		2.6						
		23.0		4.2						
7-Sep-11	54	22.6	7.51	3.7						
		22.8	7.60	3.7						
8-Sep-11	55	22.9	7.49	3.5	257.0	98	120	0.00	U	
Sediment Ended		23.0	7.52	4.8	253.6					
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.21**	**3.8**	**150**	**57**	**68**	**0.59**		
Number		**112**	**52**	**102**	**22**	**3**	**3**	**3**		
Max #		**23.6**	**7.66**	**5.2**	**272**	**98**	**120**	**1.71**		
Min#		**22.2**	**6.90**	**2.2**	**91**	**30**	**40**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.1	7.12	5.3	119.6	42	40	1.32		
		23.1	7.11	5.2	115.2					
16-Jul-11	1	23.0								
		23.0								
17-Jul-11	2	22.9								
		23.0								
18-Jul-11	3	23.0	7.02	5.0	94.9					
		23.0	7.01	4.4	97.8					
19-Jul-11	4	23.0		3.8						
		23.0		3.8						
20-Jul-11	5	22.7	7.05	3.6						
		22.7	7.06	3.5						
21-Jul-11	6	22.8								
		22.8								
22-Jul-11	7	22.9	7.14	3.7						
		22.9	7.14	3.4						
23-Jul-11	8	23.3								
		23.2								
24-Jul-11	9	23.2								
		23.2								
25-Jul-11	10	22.8	7.16	3.0	118.2					
		22.8	7.18	3.9	115.9					
26-Jul-11	11	23.1		4.3						
		23.2		4.0						
27-Jul-01	12	22.8	7.03	3.1						
		22.8	7.09	3.8						
28-Jul-11	13	23.2		3.5						
		23.1		3.9						
29-Jul-11	14	23.0	7.01	4.6						
		22.8	7.00	4.9						
30-Jul-11	15	22.6		4.0						
		22.7		4.2						
31-Jul-11	16	23.3		5.1						
		23.3		5.0						
1-Aug-11	17	23.5	7.02	3.7	95.7					
		23.5	7.08	3.8	99.4					
2-Aug-11	18	22.3		3.1						
		22.3		3.1						
3-Aug-11	19	22.8	7.05	3.8						
		22.8	7.04	3.6						
4-Aug-11	20	22.6	6.99	4.2	91.6	32	52	0.03	U	
		22.6	7.10	4.5	92.7					
5-Aug-11	21	22.6	7.03	4.5						
		22.6	6.98	4.2						
6-Aug-11	22	22.5		3.6						
		22.6		3.5						
7-Aug-11	23	22.6		4.6						
		22.6		4.7						
8-Aug-11	24	22.3	7.07	4.2	98.0					
		22.4	7.14	4.7	99.8					
9-Aug-11	25	22.5		4.9						
		22.5		5.1						
10-Aug-11	26	22.4	7.10	3.7						
		22.4	7.12	3.9						
11-Aug-11	27	22.5		4.8						
		22.5		4.7						
12-Aug-11	28	22.7	6.99	3.9						
		22.7	7.03	3.9						
13-Aug-11	29	22.6		4.3						
		22.6		4.1						
14-Aug-11	30	22.7		4.4						
		22.7		3.8						
15-Aug-11	31	22.6	7.06	4.1	99.2					
		22.5	7.10	4.6	98.7					
16-Aug-11	32	22.9		3.8						
		22.9		4.2						
17-Aug-11	33	22.5	7.19	4.0						
		22.4	7.31	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.5		3.8						
		22.4		4.0						
19-Aug-11	35	22.4	7.21	2.8						
		22.4	7.40	3.8						
20-Aug-11	36	22.7		4.0						
		22.7		4.0						
21-Aug-11	37	22.7		3.6						
		22.6		3.9						
22-Aug-11	38	23.1	7.59	4.9	159.5					
		23.0	7.56	5.1	156.4					
23-Aug-11	39	23.1		4.3						
		23.1		4.0						
24-Aug-11	40	22.8	7.41	3.9						
		23.0	7.58	4.0						
25-Aug-11	41	23.3		4.3						
		23.2		4.0						
26-Aug-11	42	23.1	7.54	3.8						
		23.1	7.72	4.1						
27-Aug-11	43	23.1		2.9						
		23.1		3.9						
28-Aug-11	44	23.1		3.1						
		23.1		2.8						
29-Aug-11	45	23.5	7.53	3.1	267.7					
		23.5	7.47	3.0	262.7					
30-Aug-11	46	23.2		3.5						
		23.2		3.9						
31-Aug-11	47	22.8	7.65	3.0						
		22.7	7.65	3.4						
1-Sep-11	48	23.3		4.8						
		23.3		4.0						
2-Sep-11	49	23.1	7.72	4.9						
		23.1	7.63	4.6						
3-Sep-11	50	23.1		4.9						
		23.1		4.6						
4-Sep-11	51	22.8		3.7						
		22.8		4.0						
5-Sep-11	52	22.9	7.57	4.0	264.0					
		23.0	7.66	4.1	288.3					
6-Sep-11	53	23.0		3.4						
		23.0		4.0						
7-Sep-11	54	22.3	7.77	6.3	264.3	102	120	0.04	J	
Sediment Ended										
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.9**	**7.25**	**4.1**	**148**	**59**	**71**	**0.46**		
Number		**109**	**49**	**99**	**21**	**3**	**3**	**3**		
Max #		**23.5**	**7.77**	**6.3**	**288**	**102**	**120**	**1.32**		
Min#		**22.3**	**6.98**	**2.8**	**92**	**32**	**40**	**0.03**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 100%

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.0	7.17	5.4	116.7	44	48	1.16		
		23.0	7.20	5.3	120.3					
16-Jul-11	1	23.0								
		23.0								
17-Jul-11	2	23.0								
		23.0								
18-Jul-11	3	23.0	7.05	4.7	97.4					
		23.0	7.06	4.5	101.3					
19-Jul-11	4	23.0		4.3						
		23.0		3.8						
20-Jul-11	5	22.6	7.11	3.5						
		22.5	7.05	4.0						
21-Jul-11	6	22.7								
		22.7								
22-Jul-11	7	23.0	7.19	4.0						
		23.0	7.18	3.9						
23-Jul-11	8	23.3								
		23.4								
24-Jul-11	9	23.0								
		23.0								
25-Jul-11	10	22.8	7.18	2.3	124.6					
		22.8	7.25	3.5	124.5					
26-Jul-11	11	23.1		2.7						
		23.2		3.8						
27-Jul-01	12	22.8	7.16	3.0						
		22.8	7.13	3.0						
28-Jul-11	13	23.1		4.2						
		23.1		3.7						
29-Jul-11	14	23.0	7.12	4.8						
		22.8	7.04	5.0						
30-Jul-11	15	22.4		4.1						
		22.4		4.1						
31-Jul-11	16	23.2		5.4						
		23.3		5.6						
1-Aug-11	17	23.4	7.16	3.9	100.1					
		23.5	7.14	3.7	99.5					
2-Aug-11	18	22.3		2.6						
		22.5		3.3						
3-Aug-11	19	22.8	7.13	4.3						
		22.8	7.11	4.5						
4-Aug-11	20	22.5	7.12	4.0	95.6	34	44	0.03	U	
		22.6	7.20	3.9	97.3					
5-Aug-11	21	22.5	7.09	3.9						
		22.5	7.11	3.9						
6-Aug-11	22	22.6		3.9						
		22.7		3.9						
7-Aug-11	23	22.6		4.4						
		22.6		4.6						
8-Aug-11	24	22.4	7.06	3.6	99.6					
		22.3	7.16	4.5	100.9					
9-Aug-11	25	22.5		4.6						
		22.5		4.3						
10-Aug-11	26	22.4	7.21	3.9						
		22.4	7.18	4.2						
11-Aug-11	27	22.5		4.3						
		22.5		4.3						
12-Aug-11	28	22.7	7.07	4.0						
		22.7	7.06	3.6						
13-Aug-11	29	22.6		3.9						
		22.6		3.9						
14-Aug-11	30	22.7		4.0						
		22.7		3.9						
15-Aug-11	31	22.4	7.24	4.5	104.1					
		22.5	7.14	4.5	97.1					
16-Aug-11	32	22.9		3.8						
		22.8		3.6						
17-Aug-11	33	22.4	7.31	3.6						
		22.4	7.38	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 100%

Test Dates: July 15-September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.4		3.9						
		22.4		4.1						
19-Aug-11	35	22.4	7.34	3.6						
		22.4	7.36	3.1						
20-Aug-11	36	22.6		4.4						
		22.7		4.0						
21-Aug-11	37	22.6		4.0						
		22.6		4.2						
22-Aug-11	38	22.9	7.64	5.3	150.8					
		22.8	7.41	5.0	157.2					
23-Aug-11	39	23.0		4.3						
		23.0		4.5						
24-Aug-11	40	22.8	7.59	3.9						
		22.8	7.61	4.1						
25-Aug-11	41	23.0		4.6						
		23.0		4.7						
26-Aug-11	42	22.9	7.66	4.0						
		23.0	7.63	4.6						
27-Aug-11	43	23.0		3.6						
		23.1		4.2						
28-Aug-11	44	23.0		3.2						
		23.0		3.5						
29-Aug-11	45	23.5	7.62	4.3	266.6					
		23.5	7.65	4.1	267.5					
30-Aug-11	46	23.1		4.8						
		23.1		3.6						
31-Aug-11	47	22.8	7.63	3.0						
		22.6	7.64	3.3						
1-Sep-11	48	23.3		4.8						
		23.3		5.4						
2-Sep-11	49	23.0	7.61	4.2						
		23.0	7.63	4.9						
3-Sep-11	50	23.1		5.1						
		23.1		4.6						
4-Sep-11	51	22.8		4.2						
		22.8		4.2						
5-Sep-11	52	23.0	7.74	4.0	268.1					
		23.1	7.75	4.0	284.1					
6-Sep-11	53	22.8		3.2						
		22.8		4.7						
7-Sep-11	54	22.7	7.53	4.7						
		22.7	7.54	4.6						
8-Sep-11	55	22.8		3.4						
		22.8		4.7						
9-Sep-11	56	22.5	7.79	5.3						
		22.5	7.56	4.1						
10-Sep-11	57	22.6		4.5						
		22.7		4.5						
11-Sep-11	58	23.1	7.86	6.7	262.0	108	116	0.00	U	
Sediment Ended		22.7	7.57	3.4	257.0					
		22.7	7.77	4.1	267.0					

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.8**	**7.34**	**4.1**	**159**	**62**	**69**	**0.40**		
Number		**119**	**55**	**109**	**23**	**3**	**3**	**3**		
Max #		**23.5**	**7.86**	**6.7**	**284**	**108**	**116**	**1.16**		
Min#		**22.3**	**7.04**	**2.3**	**96**	**34**	**44**	**0.00**		

MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.5	6.91	5.3	116.3	42	36	1.78		
		22.6	6.92	5.6	116.8					
16-Jul-11	1	23.6								
		23.7								
17-Jul-11	2	22.8								
		22.8								
18-Jul-11	3	22.8	6.94	4.4	100.1					
		22.8	6.92	4.4	100.0					
19-Jul-11	4	22.7		3.7						
		22.6		3.9						
20-Jul-11	5	22.2	7.00	2.8						
		22.2	7.01	3.2						
21-Jul-11	6	22.6								
		22.6								
22-Jul-11	7	22.6	6.97	3.4						
		22.6	7.05	3.7						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	22.8								
		22.8								
25-Jul-11	10	22.5	6.93	2.7	108.1					
		22.4	6.98	4.1	105.2					
26-Jul-11	11	22.9		4.0						
		22.9		3.4						
27-Jul-01	12	22.6	6.87	4.1						
		22.6	6.90	3.9						
28-Jul-11	13	22.8		3.4						
		22.8		3.2						
29-Jul-11	14	22.9	6.86	4.2						
		22.9	6.91	4.4						
30-Jul-11	15	23.1		3.7						
		23.2		3.8						
31-Jul-11	16	23.5		3.7						
		23.2		3.8						
1-Aug-11	17	23.8	6.91	3.1	91.3					
		23.8	6.89	2.9	87.9					
2-Aug-11	18	23.0		3.1						
		23.0		3.9						
3-Aug-11	19	22.7	7.11	2.7						
		22.8	6.91	3.0						
4-Aug-11	20	22.6	6.95	3.1	94.0	32	44	0.10		
		22.5	7.01	3.2	98.4					
5-Aug-11	21	22.5	6.99	3.2						
		22.4	6.97	3.2						
6-Aug-11	22	22.3		3.2						
		22.3		3.4						
7-Aug-11	23	22.5		3.8						
		22.5		4.0						
8-Aug-11	24	22.6	6.94	3.4	97.9					
		22.6	6.94	3.6	96.5					
9-Aug-11	25	22.3		4.8						
		22.4		4.5						
10-Aug-11	26	22.4	6.97	3.4						
		22.4	6.98	3.6						
11-Aug-11	27	22.3		3.8						
		22.3		4.3						
12-Aug-11	28	22.4	7.03	2.9						
		22.4	7.01	3.1						
13-Aug-11	29	22.3		3.4						
		22.3		3.2						
14-Aug-11	30	22.4		3.4						
		22.5		4.2						
15-Aug-11	31	22.3	6.97	3.9	95.3					
		22.2	6.99	4.6	96.9					
16-Aug-11	32	22.3		4.4						
		22.3		4.7						
17-Aug-11	33	22.4	7.13	4.3						
		22.5	7.07	4.0						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.3		3.8						
		22.2		4.0						
19-Aug-11	35	22.4	7.19	3.4						
		22.4	7.18	3.0						
20-Aug-11	36	22.6		3.6						
		22.7		3.9						
21-Aug-11	37	22.6		3.8						
		22.6		3.8						
22-Aug-11	38	22.3	7.17	4.1	138.8					
		22.3	7.24	4.3	146.6					
23-Aug-11	39	22.6		4.0						
		22.6		4.2						
24-Aug-11	40	22.6	7.22	3.5						
		22.5	7.29	3.7						
25-Aug-11	41	22.6		4.3						
		22.6		4.6						
26-Aug-11	42	22.3	7.34	4.0						
		22.4	7.32	3.8						
27-Aug-11	43	22.5		4.6						
		22.5		4.0						
28-Aug-11	44	22.4		2.9						
		22.4		2.4						
29-Aug-11	45	22.7	7.47	4.4	248.5					
		22.7	7.46	4.4	254.7					
30-Aug-11	46	22.5		4.0						
		22.5		3.1						
31-Aug-11	47	22.0	7.43	3.3						
		22.0	7.42	3.0						
1-Sep-11	48	22.8		4.5						
		22.8		4.3						
2-Sep-11	49	23.1	7.50	5.0						
		23.1	7.57	5.1						
3-Sep-11	50	22.9	7.48	4.6	253.9	100	124	0.03	U	
Sediment Ended		22.8	7.52	4.4	253.4					
4-Sep-11	51									
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.6**	**7.10**	**3.8**	**135**	**58**	**68**	**0.64**		
Number		**102**	**48**	**92**	**20**	**3**	**3**	**3**		
Max #		**23.8**	**7.57**	**5.6**	**255**	**100**	**124**	**1.78**		
Min#		**22.0**	**6.86**	**2.4**	**88**	**32**	**36**	**0.03**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.6	6.98	5.9	119.2	46	44	1.84		
		22.6	7.01	5.8	122.2					
16-Jul-11	1	23.7								
		23.7								
17-Jul-11	2	22.7								
		22.7								
18-Jul-11	3	22.8	6.98	4.6	102.6					
		22.9	6.94	4.7	99.3					
19-Jul-11	4	22.7		4.0						
		22.7		4.1						
20-Jul-11	5	22.3	7.02	3.6						
		22.2	7.02	3.4						
21-Jul-11	6	22.6								
		22.6								
22-Jul-11	7	22.7	7.06	3.0						
		22.7	7.04	3.9						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	22.8								
		22.8								
25-Jul-11	10	22.5	7.01	3.9	110.5					
		22.5	7.02	4.1	107.0					
26-Jul-11	11	22.9		4.0						
		22.9		3.2						
27-Jul-01	12	22.6	6.96	4.7						
		22.6	6.89	4.1						
28-Jul-11	13	22.8		4.0						
		22.8		4.6						
29-Jul-11	14	22.9	6.87	4.5						
		22.9	6.90	4.7						
30-Jul-11	15	23.2		3.7						
		23.3		4.0						
31-Jul-11	16	23.6		4.4						
		23.2		4.6						
1-Aug-11	17	23.8	7.01	2.9	96.7					
		23.7	7.07	3.1	95.2					
2-Aug-11	18	23.0		3.4						
		23.0		3.3						
3-Aug-11	19	22.7	7.05	3.7						
		22.8	7.07	3.5						
4-Aug-11	20	22.4	6.95	2.8	95.1	34	40	0.10		
		22.4	6.98	2.8	94.2					
5-Aug-11	21	22.5	7.05	3.4						
		22.6	7.08	3.5						
6-Aug-11	22	22.5		3.0						
		22.5		3.2						
7-Aug-11	23	22.5		3.9						
		22.6		3.9						
8-Aug-11	24	22.5	7.08	3.1	107.7					
		22.5	7.17	3.7	104.9					
9-Aug-11	25	22.4		4.9						
		22.4		4.7						
10-Aug-11	26	22.4	7.11	3.3						
		22.4	7.14	3.3						
11-Aug-11	27	22.3		4.6						
		22.4		4.8						
12-Aug-11	28	22.4	7.07	3.3						
		22.4	7.06	3.0						
13-Aug-11	29	22.3		3.3						
		22.3		3.8						
14-Aug-11	30	22.5		3.7						
		22.5		3.9						
15-Aug-11	31	22.2	6.99	3.8	99.2					
		22.2	6.96	4.4	96.7					
16-Aug-11	32	22.3		4.5						
		22.3		4.3						
17-Aug-11	33	22.5	7.15	3.9						
		22.5	7.19	4.4						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.3		4.0						
		22.2		3.9						
19-Aug-11	35	22.4	7.14	3.9						
		22.4	7.27	2.7						
20-Aug-11	36	22.5		3.7						
		22.6		3.8						
21-Aug-11	37	22.5		3.7						
		22.6		3.6						
22-Aug-11	38	22.3	7.22	4.3	144.3					
		22.3	7.26	4.5	143.7					
23-Aug-11	39	22.6		3.6						
		22.6		4.1						
24-Aug-11	40	22.5	7.31	4.0						
		22.5	7.43	4.2						
25-Aug-11	41	22.7		4.6						
		22.7		5.1						
26-Aug-11	42	22.3	7.47	4.4						
		22.4	7.44	4.3						
27-Aug-11	43	22.5		4.2						
		22.5		4.6						
28-Aug-11	44	22.4		2.3						
		22.4		2.2						
29-Aug-11	45	22.6	7.46	4.1	258.2					
		22.7	7.45	3.7	256.7					
30-Aug-11	46	22.6		3.4						
		22.6		3.0						
31-Aug-11	47	22.0	7.46	3.5						
		22.0	7.40	3.3						
1-Sep-11	48	22.8		3.8						
		22.8		4.4						
2-Sep-11	49	23.0	7.50	4.7						
		23.1	7.52	5.0						
3-Sep-11	50	22.8		4.6						
		22.9		4.5						
4-Sep-11	51	22.8		4.0						
		22.7		4.0						
5-Sep-11	52	22.8	7.48	3.0	255.8					
		22.8	7.54	3.1	259.0					
6-Sep-11	53	22.7		3.7						
		22.8		4.3						
7-Sep-11	54	22.1	7.70	6.2	262.3	102	120	0.01	U	
Sediment Ended										
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.6**	**7.16**	**3.9**	**144**	**61**	**68**	**0.65**		
Number		**109**	**49**	**99**	**21**	**3**	**3**	**3**		
Max #		**23.8**	**7.70**	**6.2**	**262**	**102**	**120**	**1.84**		
Min#		**22.0**	**6.87**	**2.2**	**94**	**34**	**40**	**0.01**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.5	7.16	6.1	124.3	46	44	1.64		
		22.6	7.16	6.0	123.5	DUP=46	DUP=48	DUP=1.57		
16-Jul-11	1	23.7								
		23.7								
17-Jul-11	2	22.7								
		22.7								
18-Jul-11	3	22.8	7.08	4.6	105.7					
		22.9	7.08	4.9	101.3					
19-Jul-11	4	22.7		4.1						
		22.7		4.4						
20-Jul-11	5	22.3	7.08	3.5						
		22.3	7.12	3.8						
21-Jul-11	6	22.6								
		22.6								
22-Jul-11	7	22.7	7.10	4.0						
		22.6	7.07	3.7						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	22.8								
		22.8								
25-Jul-11	10	22.5	7.06	4.4	109.2					
		22.5	7.04	4.6	104.1					
26-Jul-11	11	22.9		4.0						
		22.8		3.3						
27-Jul-01	12	22.8	7.00	4.6						
		22.6	6.98	3.1						
28-Jul-11	13	22.8		4.2						
		22.8		4.5						
29-Jul-11	14	22.9	6.95	4.7						
		22.9	6.99	5.0						
30-Jul-11	15	23.2		4.6						
		23.3		4.1						
31-Jul-11	16	23.8		5.3						
		23.2		5.5						
1-Aug-11	17	23.8	7.04	3.4	90.5					
		23.8	7.16	4.1	91.3					
2-Aug-11	18	23.1		3.7						
		23.1		3.5						
3-Aug-11	19	22.9	7.18	4.3						
		22.9	7.20	4.0						
4-Aug-11	20	22.4	7.11	3.3	97.2	36	52	0.06	J	
		22.4	7.16	3.6	98.8					
5-Aug-11	21	22.5	7.14	4.1						
		22.5	7.10	4.2						
6-Aug-11	22	22.4		3.4						
		22.4		3.5						
7-Aug-11	23	22.6		4.2						
		22.7		4.0						
8-Aug-11	24	22.6	7.23	4.4	105.3					
		22.6	7.29	4.1	107.5					
9-Aug-11	25	22.4		5.4						
		22.4		5.5						
10-Aug-11	26	22.4	7.22	4.3						
		22.4	7.38	4.3						
11-Aug-11	27	22.4		4.9						
		22.4		4.8						
12-Aug-11	28	22.4	7.12	3.2						
		22.4	7.10	3.6						
13-Aug-11	29	22.3		4.0						
		22.3		3.6						
14-Aug-11	30	22.4		4.6						
		22.5		3.5						
15-Aug-11	31	22.2	7.09	4.6	100.0					
		22.3	7.05	4.3	100.9					
16-Aug-11	32	22.2		5.3						
		22.3		5.2						
17-Aug-11	33	22.5	7.16	3.2						
		22.5	7.27	4.8						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.3		4.0						
		22.3		4.3						
19-Aug-11	35	22.4	7.22	3.2						
		22.4	7.25	3.1						
20-Aug-11	36	22.7		3.7						
		22.5		3.7						
21-Aug-11	37	22.6		3.8						
		22.6		3.5						
22-Aug-11	38	22.3	7.36	6.1	145.5					
		22.3	7.43	5.1	146.0					
23-Aug-11	39	22.6		4.0						
		22.6		4.1						
24-Aug-11	40	22.6	7.32	3.5						
		22.6	7.47	4.7						
25-Aug-11	41	22.6		3.4						
		22.7		4.4						
26-Aug-11	42	22.3	7.53	3.0						
		22.4	7.40	2.8						
27-Aug-11	43	22.5		4.0						
		22.5		2.5						
28-Aug-11	44	22.4		3.2						
		22.4		2.4						
29-Aug-11	45	22.6	7.51	4.0	258.6					
		22.6	7.55	3.5	261.9					
30-Aug-11	46	22.5		4.1						
		22.5		3.3						
31-Aug-11	47	22.0	7.53	3.8						
		22.0	7.53	3.4						
1-Sep-11	48	22.8		4.4						
		22.8		3.8						
2-Sep-11	49	23.1	7.55	5.0						
		23.1	7.63	5.4						
3-Sep-11	50	22.8		4.5						
		22.9		4.7						
4-Sep-11	51	22.8		4.4						
		22.8		4.0						
5-Sep-11	52	22.8	7.61	4.0	275.5					
		22.8	7.59	3.7	265.5					
6-Sep-11	53	22.7		4.6						
		22.7		4.5						
7-Sep-11	54	22.8	7.45	4.2						
		22.8	7.56	4.1						
8-Sep-11	55	23.0	7.61	5.8	254.4	102	132	0.00	U	
Sediment Ended		23.0	7.56	5.1	255.2					
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.7**	**7.26**	**4.2**	**151**	**61**	**76**	**0.57**		
Number		**112**	**52**	**102**	**22**	**3**	**3**	**3**		
Max #		**23.8**	**7.63**	**6.1**	**276**	**102**	**132**	**1.64**		
Min#		**22.0**	**6.95**	**2.4**	**91**	**36**	**44**	**0.00**		

MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.0	7.27	6.1	130.5	48	48	1.51		
		22.6	7.35	6.2	133.4					
16-Jul-11	1	23.6								
		23.7								
17-Jul-11	2	22.7								
		22.7								
18-Jul-11	3	22.8	7.11	4.9	104.1					
		22.9	7.12	5.3	102.2					
19-Jul-11	4	22.7		4.5						
		22.7		4.6						
20-Jul-11	5	22.3	7.12	3.5						
		22.3	7.13	3.7						
21-Jul-11	6	22.6								
		22.6								
22-Jul-11	7	22.6	7.08	4.0						
		22.6	7.13	4.0						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	22.8								
		22.8								
25-Jul-11	10	22.5	7.19	4.7	117.5					
		22.5	7.19	4.1	122.7					
26-Jul-11	11	22.8		4.0						
		22.8		4.5						
27-Jul-01	12	22.5	7.02	4.4						
		22.5	6.97	3.7						
28-Jul-11	13	22.7		4.7						
		22.7		4.9						
29-Jul-11	14	22.9	7.06	5.0						
		22.9	7.03	5.4						
30-Jul-11	15	23.2		5.0						
		23.3		5.1						
31-Jul-11	16	23.4		6.6						
		23.2		6.5						
1-Aug-11	17	23.7	7.23	4.0	94.1					
		23.8	7.32	4.3	97.9					
2-Aug-11	18	23.0		4.0						
		23.0		4.2						
3-Aug-11	19	22.7	7.22	4.7						
		22.7	7.28	4.7						
4-Aug-11	20	22.4	7.23	3.9	100.9	36	44	0.03	U	
		22.4	7.30	4.2	102.8					
5-Aug-11	21	22.5	7.23	4.5						
		22.5	7.25	4.7						
6-Aug-11	22	22.5		4.7						
		22.4		4.6						
7-Aug-11	23	22.7		4.5						
		22.7		4.8						
8-Aug-11	24	22.6	7.29	4.9	106.8					
		22.6	7.32	5.1	107.4					
9-Aug-11	25	22.4		5.8						
		22.4		5.9						
10-Aug-11	26	22.4	7.35	4.8						
		22.4	7.27	4.9						
11-Aug-11	27	22.4		5.4						
		22.4		5.1						
12-Aug-11	28	22.4	7.15	3.5						
		22.4	7.17	3.5						
13-Aug-11	29	22.5		4.3						
		22.4		3.7						
14-Aug-11	30	22.5		4.5						
		22.5		5.3						
15-Aug-11	31	22.2	7.08	5.0	100.1					
		22.2	7.06	4.9	99.0					
16-Aug-11	32	22.3		5.2						
		22.3		5.5						
17-Aug-11	33	22.4	7.28	4.5						
		22.5	7.29	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.3		4.5						
		22.3		4.4						
19-Aug-11	35	22.4	7.29	3.5						
		22.4	7.30	3.8						
20-Aug-11	36	22.6		4.0						
		22.6		4.4						
21-Aug-11	37	22.6		4.0						
		22.5		4.1						
22-Aug-11	38	22.3	7.49	5.6	148.7					
		22.3	7.44	5.4	152.0					
23-Aug-11	39	22.6		3.9						
		22.6		4.5						
24-Aug-11	40	22.6	7.53	5.0						
		22.6	7.50	4.4						
25-Aug-11	41	22.8		5.0						
		22.8		4.7						
26-Aug-11	42	22.4	7.51	3.5						
		22.4	7.56	3.7						
27-Aug-11	43	22.5		3.9						
		22.5		5.0						
28-Aug-11	44	22.4		3.5						
		22.3		3.8						
29-Aug-11	45	22.6	7.56	4.5	260.0					
		22.6	7.53	3.8	260.3					
30-Aug-11	46	22.5		4.0						
		22.5		3.2						
31-Aug-11	47	22.1	7.54	4.4						
		22.1	7.58	3.9						
1-Sep-11	48	22.8		5.0						
		22.8		4.7						
2-Sep-11	49	23.0	7.62	5.4						
		23.1	7.57	5.4						
3-Sep-11	50	22.9		4.8						
		22.9		4.7						
4-Sep-11	51	22.7		4.4						
		22.8		4.4						
5-Sep-11	52	22.8	7.61	4.2	264.7					
		22.9	7.64	4.2	263.4					
6-Sep-11	53	22.7		4.0						
		22.8		4.9						
7-Sep-11	54	22.2	7.75	6.8	264.0	102	120	0.01	U	
Sediment Ended										
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.6**	**7.31**	**4.6**	**149**	**62**	**71**	**0.52**		
Number		**109**	**49**	**99**	**21**	**3**	**3**	**3**		
Max #		**23.8**	**7.75**	**6.8**	**265**	**102**	**120**	**1.51**		
Min#		**22.0**	**6.97**	**3.2**	**94**	**36**	**44**	**0.01**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.6	7.58	6.2	131.1	50	56	1.15		
		22.6	7.50	6.5	131.2					
16-Jul-11	1	23.6								
		23.6								
17-Jul-11	2	22.7								
		22.6								
18-Jul-11	3	22.8	7.19	5.3	108.9					
		22.8	7.21	5.4	105.7					
19-Jul-11	4	22.7		4.7						
		22.7		4.5						
20-Jul-11	5	22.2	7.18	3.5						
		22.2	7.19	3.9						
21-Jul-11	6	22.6								
		22.6								
22-Jul-11	7	22.6	7.16	3.9						
		22.6	7.15	4.2						
23-Jul-11	8	23.0								
		23.0								
24-Jul-11	9	22.8								
		22.8								
25-Jul-11	10	22.5	7.18	4.5	117.6					
		22.5	7.16	3.9	114.4					
26-Jul-11	11	22.8		4.6						
		22.7		4.6						
27-Jul-01	12	22.5	7.10	4.7						
		22.5	7.02	4.7						
28-Jul-11	13	22.6		5.0						
		22.6		5.1						
29-Jul-11	14	22.9	7.09	5.2						
		22.8	7.11	5.2						
30-Jul-11	15	23.2		5.5						
		23.2		5.5						
31-Jul-11	16	23.3		7.1						
		23.1		6.9						
1-Aug-11	17	23.7	7.09	4.7	88.6					
		23.7	7.19	5.2	88.9					
2-Aug-11	18	22.9		5.0						
		22.9		4.6						
3-Aug-11	19	22.7	7.28	5.1						
		22.7	7.27	5.4						
4-Aug-11	20	22.3	7.26	4.5	95.0	34	40	0.03	U	
		22.4	7.20	4.8	93.9					
5-Aug-11	21	22.5	7.13	5.0						
		22.6	7.19	5.1						
6-Aug-11	22	22.3		4.7						
		22.5		5.0						
7-Aug-11	23	22.7		5.0						
		22.7		4.9						
8-Aug-11	24	22.6	7.39	5.5	99.3					
		22.6	7.32	5.0	103.0					
9-Aug-11	25	22.4		6.2						
		22.4		6.3						
10-Aug-11	26	22.5	7.30	5.3						
		22.4	7.31	5.2						
11-Aug-11	27	22.4		5.9						
		22.4		5.7						
12-Aug-11	28	22.4	7.16	3.9						
		22.4	7.19	3.4						
13-Aug-11	29	22.5		4.6						
		22.5		4.9						
14-Aug-11	30	22.5		5.1						
		22.5		4.9						
15-Aug-11	31	22.3	7.24	5.2	101.6					
		22.3	7.18	5.0	101.7					
16-Aug-11	32	22.3		5.5						
		22.3		5.9						
17-Aug-11	33	22.4	7.30	5.4						
		22.4	7.30	4.7						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.3		4.6						
		22.3		4.2						
19-Aug-11	35	22.4	7.33	4.1						
		22.4	7.34	4.3						
20-Aug-11	36	22.6		4.2						
		22.6		4.4						
21-Aug-11	37	22.6		4.3						
		22.6		4.0						
22-Aug-11	38	22.3	7.46	5.8	146.5					
		22.3	7.57	6.1	148.4					
23-Aug-11	39	22.6		4.5						
		22.6		4.6						
24-Aug-11	40	22.6	7.54	4.5						
		22.7	7.59	5.2						
25-Aug-11	41	22.7		4.5						
		22.8		4.0						
26-Aug-11	42	22.5	7.52	3.5						
		22.5	7.59	4.4						
27-Aug-11	43	22.5		3.5						
		22.5		4.7						
28-Aug-11	44	22.3		3.5						
		22.4		2.9						
29-Aug-11	45	22.6	7.59	4.0	265.4					
		22.6	7.56	3.8	261.9					
30-Aug-11	46	22.5		4.9						
		22.6		4.7						
31-Aug-11	47	22.1	7.71	5.1						
		22.1	7.70	3.2						
1-Sep-11	48	22.8		4.7						
		22.8		5.3						
2-Sep-11	49	23.0	7.64	5.7						
		23.0	7.69	5.7						
3-Sep-11	50	23.0		5.4						
		22.9		5.2						
4-Sep-11	51	22.7		4.4						
		22.7		4.7						
5-Sep-11	52	22.9	7.22	4.2	264.7					
		22.9	7.29	4.5	265.5					
6-Sep-11	53	22.9		4.5						
		22.8		4.4						
7-Sep-11	54	22.6	7.53	4.7						
		22.7	7.68	5.9						
8-Sep-11	55	23.0	7.60	4.9	257.8	102	120	0.00	U	
Sediment Ended		23.0	7.65	5.7	255.2					
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.6**	**7.34**	**4.8**	**152**	**62**	**72**	**0.39**		
Number		**112**	**52**	**102**	**22**	**3**	**3**	**3**		
Max #		**23.7**	**7.71**	**7.1**	**266**	**102**	**120**	**1.15**		
Min#		**22.1**	**7.02**	**2.9**	**89**	**34**	**40**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	22.6	7.78	6.6	132.0	52	56	0.98		
		22.6	7.78	6.7	131.0					
16-Jul-11	1	23.6								
		23.6								
17-Jul-11	2	22.7								
		22.7								
18-Jul-11	3	22.8	7.28	5.8	105.3					
		22.8	7.30	5.6	111.5					
19-Jul-11	4	22.7		4.3						
		22.7		4.6						
20-Jul-11	5	22.2	7.23	4.0						
		22.3	7.22	3.8						
21-Jul-11	6	22.6								
		22.6								
22-Jul-11	7	22.6	7.20	4.2						
		22.6	7.16	4.3						
23-Jul-11	8	22.9								
		23.0								
24-Jul-11	9	22.8								
		22.8								
25-Jul-11	10	22.5	7.18	3.6	121.8					
		22.5	7.17	3.5	116.7					
26-Jul-11	11	22.8		4.5						
		22.7		4.9						
27-Jul-01	12	22.5	7.11	4.3						
		22.5	7.14	5.7						
28-Jul-11	13	22.6		5.4						
		22.6		4.9						
29-Jul-11	14	22.8	7.11	6.0						
		22.8	7.19	6.0						
30-Jul-11	15	23.1		6.0						
		23.1		5.7						
31-Jul-11	16	23.3		7.5						
		23.1		7.5						
1-Aug-11	17	23.7	7.19	5.2	89.2					
		23.8	7.21	5.5	90.1					
2-Aug-11	18	22.8		5.0						
		22.8		5.2						
3-Aug-11	19	22.7	7.22	5.4						
		22.6	7.23	5.6						
4-Aug-11	20	22.4	7.23	5.1	93.3	32	40	0.03	U	
		22.3	7.23	4.7	94.2	32	40	0.04	J	
5-Aug-11	21	22.5	7.17	5.3						
		22.5	7.17	5.4						
6-Aug-11	22	22.4		5.5						
		22.5		4.8						
7-Aug-11	23	22.6		5.1						
		22.7		5.1						
8-Aug-11	24	22.6	7.25	4.7	103.0					
		22.6	7.31	5.5	101.1					
9-Aug-11	25	22.4		6.5						
		22.4		6.7						
10-Aug-11	26	22.4	7.35	5.5						
		22.4	7.33	5.6						
11-Aug-11	27	22.4		6.2						
		22.4		6.6						
12-Aug-11	28	22.4	7.14	3.4						
		22.4	7.15	3.6						
13-Aug-11	29	22.4		5.2						
		22.5		4.5						
14-Aug-11	30	22.5		5.1						
		22.5		4.5						
15-Aug-11	31	22.3	7.20	5.5	98.9					
		22.3	7.23	5.7	98.0					
16-Aug-11	32	22.3		5.9						
		22.3		5.4						
17-Aug-11	33	22.4	7.30	5.0						
		22.4	7.31	5.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.3		4.6						
		22.2		4.3						
19-Aug-11	35	22.4	7.24	3.5						
		22.4	7.28	3.6						
20-Aug-11	36	22.6		4.1						
		22.6		4.3						
21-Aug-11	37	22.5		4.0						
		22.6		4.2						
22-Aug-11	38	22.3	7.55	6.1	146.0					
		22.3	7.45	6.3	145.6					
23-Aug-11	39	22.6		4.7						
		22.6		4.4						
24-Aug-11	40	22.7	7.58	5.0						
		22.7	7.55	4.6						
25-Aug-11	41	22.7		5.1						
		.22.8		5.2						
26-Aug-11	42	22.5	7.66	5.1						
		22.5	7.64	5.2						
27-Aug-11	43	22.5		5.0						
		22.5		5.3						
28-Aug-11	44	22.4		3.4						
		22.4		4.2						
29-Aug-11	45	22.6	7.63	4.2	262.0					
		22.6	7.61	4.8	262.4					
30-Aug-11	46	22.6		4.6						
		22.6		4.6						
31-Aug-11	47	22.1	7.71	4.5						
		22.0	7.67	4.9						
1-Sep-11	48	22.8		5.7						
		22.8		5.4						
2-Sep-11	49	23.0	7.69	6.0						
		23.0	7.74	6.0						
3-Sep-11	50	23.0		5.7						
		23.0		5.2						
4-Sep-11	51	22.8	7.59	4.7	266.0	100	124	0.00	U	
Sediment Ended		22.7	7.62	4.5	265.9					
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**22.6**	**7.36**	**5.1**	**142**	**54**	**65**	**0.26**		
Number		**103**	**48**	**94**	**20**	**4**	**4**	**4**		
Max #		**23.8**	**7.78**	**7.5**	**266**	**100**	**124**	**0.98**		
Min#		**22.0**	**7.11**	**3.4**	**89**	**32**	**40**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.7	6.97	5.7	114.3	44	44	1.71		
		23.7	6.98	5.6	110.4					
16-Jul-11	1	23.9								
		23.9								
17-Jul-11	2	23.6								
		23.6								
18-Jul-11	3	23.6	6.72	4.9	100.2					
		23.6	6.79	4.8	100.5					
19-Jul-11	4	23.4		4.3						
		23.3		4.9						
20-Jul-11	5	23.1	7.05	3.5						
		23.0	7.10	4.3						
21-Jul-11	6	23.9								
		23.8								
22-Jul-11	7	23.2	7.04	4.2						
		23.2	7.04	3.7						
23-Jul-11	8	23.4								
		23.4								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	22.9	7.00	3.2	108.1					
		23.1	7.04	3.5	113.6					
26-Jul-11	11	23.2		4.6						
		23.3		3.8						
27-Jul-01	12	23.0	6.92	2.2						
		23.0	6.98	3.4						
28-Jul-11	13	23.1		3.5						
		23.2		4.1						
29-Jul-11	14	23.2	7.07	4.0						
		23.2	7.00	4.2						
30-Jul-11	15	23.6		3.1						
		23.5		3.1						
31-Jul-11	16	23.7		4.6						
		23.7		4.5						
1-Aug-11	17	23.6	7.04	3.1	100.4					
		23.6	7.03	3.2	97.0					
2-Aug-11	18	23.7		2.7						
		23.6		2.8						
3-Aug-11	19	22.9	6.92	4.1						
		23.0	6.98	2.7						
4-Aug-11	20	22.9	7.07	3.1	102.7	34	44	0.07	J	
		22.8	7.05	3.0	100.1					
5-Aug-11	21	22.6	6.85	3.2						
		22.7	6.89	3.6						
6-Aug-11	22	22.7		3.2						
		22.7		3.3						
7-Aug-11	23	22.8		4.4						
		22.7		4.7						
8-Aug-11	24	22.8	6.96	3.6	98.9					
		22.8	6.97	4.5	97.5					
9-Aug-11	25	22.6		4.7						
		22.6		3.9						
10-Aug-11	26	22.8	6.86	3.1						
		22.8	6.97	3.7						
11-Aug-11	27	22.7		4.5						
		22.7		4.2						
12-Aug-11	28	22.8	7.04	3.6						
		22.7	7.01	3.2						
13-Aug-11	29	22.8		4.7						
		22.8		3.7						
14-Aug-11	30	22.8		5.2						
		22.9		4.0						
15-Aug-11	31	22.4	6.72	4.4	96.2					
		22.6	6.81	5.1	94.1					
16-Aug-11	32	22.9		3.8						
		22.9		4.6						
17-Aug-11	33	22.9	7.10	4.4						
		22.9	7.10	4.0						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.7		4.3						
		22.6		4.4						
19-Aug-11	35	22.8	7.27	3.1						
		22.8	7.03	3.5						
20-Aug-11	36	22.8		3.1						
		22.8		3.2						
21-Aug-11	37	22.9		3.3						
		22.8		3.2						
22-Aug-11	38	22.8	7.17	4.8	142.4					
		22.8	7.10	4.6	143.6					
23-Aug-11	39	23.1		4.6						
		23.2		3.6						
24-Aug-11	40	22.9	7.29	4.1						
		23.0	7.26	3.7						
25-Aug-11	41	23.0		3.6						
		23.1		4.3						
26-Aug-11	42	22.8	7.32	4.2						
		22.8	7.28	4.9						
27-Aug-11	43	22.6		4.3						
		22.7		3.5						
28-Aug-11	44	22.7		2.2						
		22.7		2.6						
29-Aug-11	45	23.1	7.30	4.3	258.5					
		23.1	7.39	4.9	252.3					
30-Aug-11	46	22.7		3.5						
		22.7		3.4						
31-Aug-11	47	22.6	7.43	4.1						
		22.6	7.46	3.1						
1-Sep-11	48	22.6		3.6						
		22.6		3.8						
2-Sep-11	49	22.8	7.49	4.2						
		22.9	7.56	3.5						
3-Sep-11	50	22.6		5.0						
		22.6		4.9						
4-Sep-11	51	22.9		3.9						
		22.8		3.6						
5-Sep-11	52	22.8	7.49	3.7	255.2					
		22.7	7.40	3.4	254.3					
6-Sep-11	53	23.0	7.55	4.0	260.4	102	120	0.16		
Sediment Ended		23.1	7.41	2.6	258.2					
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 10%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.11**	**3.9**	**148**	**60**	**69**	**0.65**		
Number		**108**	**50**	**98**	**22**	**3**	**3**	**3**		
Max #		**23.9**	**7.56**	**5.7**	**260**	**102**	**120**	**1.71**		
Min#		**22.4**	**6.72**	**2.2**	**94**	**34**	**44**	**0.07**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.7	7.03	5.7	115.7	44	48	1.91		
		23.7	7.00	5.6	115.8					
16-Jul-11	1	23.8								
		23.8								
17-Jul-11	2	23.6								
		23.6								
18-Jul-11	3	23.6	6.90	4.6	104.9					
		23.6	6.94	4.5	102.6					
19-Jul-11	4	23.5		4.2						
		23.6		4.0						
20-Jul-11	5	23.2	7.05	3.6						
		23.2	7.06	3.4						
21-Jul-11	6	23.6								
		23.6								
22-Jul-11	7	23.2	7.03	3.8						
		23.2	7.04	3.6						
23-Jul-11	8	23.4								
		23.4								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	23.1	7.07	2.2	109.3					
		23.1	6.95	4.4	107.1					
26-Jul-11	11	23.3		4.2						
		23.3		2.8						
27-Jul-01	12	23.1	6.95	3.9						
		23.1	7.15	4.2						
28-Jul-11	13	23.2		4.2						
		23.2		3.9						
29-Jul-11	14	23.1	7.04	4.5						
		23.2	7.09	4.6						
30-Jul-11	15	23.4		2.9						
		23.4		3.3						
31-Jul-11	16	23.7		4.9						
		23.6		4.9						
1-Aug-11	17	23.6	7.03	3.3	97.9					
		23.7	7.00	3.0	96.4					
2-Aug-11	18	23.6		3.3						
		23.5		3.4						
3-Aug-11	19	23.1	7.05	3.8						
		23.3	7.08	3.6						
4-Aug-11	20	22.9	6.99	3.4	98.3	34	40	0.07	J	
		22.9	7.04	3.3	99.5					
5-Aug-11	21	22.6	6.86	3.4						
		22.6	7.00	4.0						
6-Aug-11	22	22.7		3.0						
		22.7		4.0						
7-Aug-11	23	22.7		4.7						
		22.7		4.6						
8-Aug-11	24	22.8	7.03	3.7	100.3					
		22.8	7.10	3.7	96.3					
9-Aug-11	25	22.6		4.8						
		22.6		4.5						
10-Aug-11	26	22.8	7.01	3.9						
		22.7	6.99	3.5						
11-Aug-11	27	22.7		4.4						
		22.7		4.8						
12-Aug-11	28	22.8	7.01	2.9						
		22.8	7.01	3.4						
13-Aug-11	29	22.7		2.8						
		22.7		3.2						
14-Aug-11	30	22.9		3.1						
		22.9		4.2						
15-Aug-11	31	22.5	6.87	4.6	97.0					
		22.4	6.90	4.1	98.4					
16-Aug-11	32	23.0		4.3						
		22.9		5.0						
17-Aug-11	33	22.9	7.10	3.8						
		22.9	7.17	4.4						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.7		4.1						
		22.5		4.4						
19-Aug-11	35	22.8	7.16	2.9						
		22.8	7.24	4.3						
20-Aug-11	36	22.8		3.4						
		22.8		3.4						
21-Aug-11	37	22.8		3.5						
		22.8		3.4						
22-Aug-11	38	22.8	7.28	4.9	142.2					
		22.8	7.26	5.6	143.7					
23-Aug-11	39	23.2		4.7						
		23.2		5.3						
24-Aug-11	40	22.8	7.34	4.2						
		23.0	7.45	5.1						
25-Aug-11	41	23.1		4.9						
		23.1		5.1						
26-Aug-11	42	22.8	7.48	4.9						
		22.8	7.47	4.4						
27-Aug-11	43	22.7		4.0						
		22.7		4.6						
28-Aug-11	44	22.7		3.9						
		22.7		2.4						
29-Aug-11	45	23.1	7.38	4.0	255.3					
		23.1	7.43	4.7	254.9					
30-Aug-11	46	22.8		4.1						
		22.8		4.7						
31-Aug-11	47	22.5	7.62	4.8						
		22.5	7.53	4.0						
1-Sep-11	48	22.6		4.5						
		22.6		4.6						
2-Sep-11	49	22.8	7.61	4.9						
		22.9	7.54	4.1						
3-Sep-11	50	22.6		4.6						
		22.6		5.0						
4-Sep-11	51	22.9		3.4						
		22.9		3.8						
5-Sep-11	52	22.7	7.47	3.7	256.7					
		22.7	7.46	3.9	258.9					
6-Sep-11	53	22.5		5.2						
		22.6		3.8						
7-Sep-11	54	22.6	7.74	4.5						
		22.6	7.46	4.7						
8-Sep-11	55	22.8		3.6						
		22.8		4.6						
9-Sep-11	56	22.5	7.46	3.9						
		22.6	7.61	4.8						
10-Sep-11	57	22.5		4.9						
		22.8		4.0						
11-Sep-11	58	22.8		4.0						
		22.7		4.2						
12-Sep-11	59	22.8	7.32	3.7	253.3					
		22.8	7.38	3.8	260.2					
13-Sep-11	60	23.2		3.9						
		23.1		4.4						
14-Sep-11	61	23.2	7.46	3.0	262.7	108.000	124	0.10		
Sediment Ended		23.2	7.66	2.8	268.9		132			

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 20%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.20**	**4.1**	**158**	**62**	**86**	**0.69**		
Number		**124**	**56**	**114**	**24**	**3**	**4**	**3**		
Max #		**23.8**	**7.74**	**5.7**	**269**	**108**	**132**	**1.91**		
Min#		**22.4**	**6.86**	**2.2**	**96**	**34**	**40**	**0.07**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.8	7.09	5.9	119.6	42	40	1.81		
		23.8	7.12	6.0	120.5					
16-Jul-11	1	23.8								
		23.8								
17-Jul-11	2	23.6								
		23.6								
18-Jul-11	3	23.5	6.99	4.6	101.8					
		23.5	6.94	4.6	99.1					
19-Jul-11	4	23.6		4.4						
		23.6		4.3						
20-Jul-11	5	23.2	7.07	3.1						
		23.2	7.09	3.9						
21-Jul-11	6	23.5								
		23.3								
22-Jul-11	7	23.2	7.03	3.4						
		23.2	7.07	4.0						
23-Jul-11	8	23.4								
		23.4								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	23.0	7.03	3.0	110.7					
		23.0	7.08	3.4	108.8					
26-Jul-11	11	23.3		4.2						
		23.3		4.1						
27-Jul-01	12	23.2	6.96	4.3						
		23.2	7.02	3.6						
28-Jul-11	13	23.2		4.0						
		23.2		4.1						
29-Jul-11	14	23.2	7.07	5.4						
		23.2	7.05	5.0						
30-Jul-11	15	23.5		4.0						
		23.5		3.8						
31-Jul-11	16	23.7		5.3						
		23.6		5.5						
1-Aug-11	17	23.6	7.15	3.6	95.3					
		23.5	7.13	3.5	96.5					
2-Aug-11	18	23.5		3.8						
		23.5		3.2						
3-Aug-11	19	23.3	7.13	4.7						
		23.3	7.20	3.9						
4-Aug-11	20	23.0	7.23	3.3	102.4	34	44	0.04	J	
		23.0	7.05	4.0	93.9					
5-Aug-11	21	22.7	7.06	4.2						
		22.7	7.11	4.5						
6-Aug-11	22	22.7		4.2						
		22.7		3.8						
7-Aug-11	23	22.7		4.9						
		22.8		4.7						
8-Aug-11	24	22.8	7.12	5.2	100.0					
		22.8	7.09	4.0	102.2					
9-Aug-11	25	22.6		5.1						
		22.6		4.9						
10-Aug-11	26	22.7	7.15	4.5						
		22.7	7.14	4.6						
11-Aug-11	27	22.6		5.0						
		22.6		4.8						
12-Aug-11	28	22.9	7.01	3.5						
		23.0	7.07	3.9						
13-Aug-11	29	22.7		4.1						
		22.7		4.3						
14-Aug-11	30	22.9		4.5						
		22.9		4.0						
15-Aug-11	31	22.6	7.05	5.2	97.9					
		22.6	7.02	4.6	99.0					
16-Aug-11	32	22.9		4.9						
		22.9		5.0						
17-Aug-11	33	22.9	7.17	4.5						
		22.9	7.18	4.7						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.6		4.6						
		22.6		4.3						
19-Aug-11	35	22.8	7.30	3.6						
		22.8	7.23	4.1						
20-Aug-11	36	22.8		3.4						
		22.8		3.7						
21-Aug-11	37	22.8		3.6						
		22.8		3.3						
22-Aug-11	38	22.8	7.33	5.1	144.0					
		22.8	7.29	5.4	146.2					
23-Aug-11	39	23.2		5.1						
		23.2		4.4						
24-Aug-11	40	23.0	7.52	5.6						
		23.0	7.40	4.2						
25-Aug-11	41	23.1		4.6						
		23.1		3.6						
26-Aug-11	42	22.8	7.50	5.0						
		22.8	7.61	4.8						
27-Aug-11	43	22.7		4.4						
		22.7		4.4						
28-Aug-11	44	22.7		4.1						
		22.7		3.5						
29-Aug-11	45	23.1	7.53	4.8	260.0					
		23.0	7.51	4.5	257.4					
30-Aug-11	46	22.9		4.2						
		22.8		4.5						
31-Aug-11	47	22.5	7.56	4.3						
		22.5	7.57	4.1						
1-Sep-11	48	22.6		4.8						
		22.6		5.1						
2-Sep-11	49	23.0	7.54	4.4						
		22.8	7.59	4.6						
3-Sep-11	50	22.6		5.2						
		22.7		5.4						
4-Sep-11	51	22.9		4.0						
		22.9		4.1						
5-Sep-11	52	22.9	7.56	4.0	264.1					
		22.7	7.59	4.0	255.7					
6-Sep-11	53	22.7		4.2						
		22.6		3.6						
7-Sep-11	54	22.4	7.59	4.6						
		22.5	7.55	4.5						
8-Sep-11	55	22.7		4.2						
		22.7		4.2						
9-Sep-11	56	22.5	7.68	5.4						
		22.5	7.47	5.3						
10-Sep-11	57	22.9		4.3						
		22.9		4.2						
11-Sep-11	58	22.7		3.9						
		22.7		4.4						
12-Sep-11	59	22.7	7.45	4.3	259.3					
		22.8	7.47	4.2	253.4					
13-Sep-11	60	23.3	7.12	4.4	264.1			0.00	U	
Sediment Ended		23.2	7.25	4.7	261.3					
14-Sep-11	61									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 40%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.25**	**4.4**	**159**	**38**	**42**	**0.62**		
Number		**122**	**56**	**112**	**24**	**2**	**2**	**3**		
Max #		**23.8**	**7.68**	**6.0**	**264**	**42**	**44**	**1.81**		
Min#		**22.4**	**6.94**	**3.0**	**94**	**34**	**40**	**0.00**		

MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.8	7.38	6.2	149.7	40	44	1.23		
		23.8	7.35	6.1	126.3					
16-Jul-11	1	23.9								
		23.8								
17-Jul-11	2	23.6								
		23.6								
18-Jul-11	3	23.5	7.07	4.6	106.4					
		23.5	7.03	4.6	102.8					
19-Jul-11	4	23.6		4.7						
		23.6		4.4						
20-Jul-11	5	23.2	7.12	4.1						
		23.2	7.13	4.5						
21-Jul-11	6	23.3								
		23.3								
22-Jul-11	7	23.2	7.10	3.5						
		23.2	7.08	4.0						
23-Jul-11	8	23.4								
		23.4								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	23.0	7.07	4.8	110.6					
		23.0	7.10	4.0	108.3					
26-Jul-11	11	23.3		2.6						
		23.3		3.2						
27-Jul-01	12	23.1	7.04	5.0						
		23.0	7.08	5.0						
28-Jul-11	13	23.2		4.3						
		23.2		4.9						
29-Jul-11	14	23.2	7.12	5.6						
		23.2	7.11	5.8						
30-Jul-11	15	23.6		4.5						
		23.5		4.8						
31-Jul-11	16	23.7		6.0						
		23.6		5.9						
1-Aug-11	17	23.7	7.10	4.3	94.3					
		23.6	7.21	4.4	90.7					
2-Aug-11	18	23.5		3.8						
		23.5		4.3						
3-Aug-11	19	23.3	7.29	4.9						
		23.3	7.32	4.7						
4-Aug-11	20	22.9	7.10	4.1	98.1	34	44	0.04	J	
		22.9	7.13	4.5	97.2					
5-Aug-11	21	22.7	7.14	5.0						
		22.7	7.15	4.6						
6-Aug-11	22	22.7		4.4						
		22.7		4.0						
7-Aug-11	23	22.8		4.9						
		22.7		5.4						
8-Aug-11	24	22.8	7.23	4.5	105.1					
		22.8	7.30	4.7	105.7					
9-Aug-11	25	22.6		5.3						
		22.6		5.6						
10-Aug-11	26	22.7	7.20	4.3						
		22.7	7.21	3.9						
11-Aug-11	27	22.6		5.4						
		22.5		5.6						
12-Aug-11	28	23.0	7.11	4.2						
		23.0	7.07	4.7						
13-Aug-11	29	22.7		3.8						
		22.7		4.7						
14-Aug-11	30	23.0		4.4						
		23.0		4.5						
15-Aug-11	31	22.5	7.08	4.9	99.5					
		22.5	7.10	5.3	98.5					
16-Aug-11	32	23.0		5.6						
		22.9		5.3						
17-Aug-11	33	22.9	7.27	4.2						
		22.9	7.26	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.6		4.5						
		22.6		4.4						
19-Aug-11	35	22.8	7.45	4.0						
		22.8	7.33	4.4						
20-Aug-11	36	22.7		4.0						
		22.7		4.1						
21-Aug-11	37	22.7		3.7						
		22.8		3.9						
22-Aug-11	38	22.8	7.41	5.8	156.0					
		22.8	7.55	4.9	152.2					
23-Aug-11	39	23.2		4.6						
		23.2		5.5						
24-Aug-11	40	23.0	7.55	4.6						
		23.1	7.57	4.2						
25-Aug-11	41	23.0		5.8						
		23.1		4.9						
26-Aug-11	42	22.7	7.72	5.5						
		22.8	7.69	5.0						
27-Aug-11	43	22.8		4.0						
		22.8		4.3						
28-Aug-11	44	22.7		3.7						
		22.7		2.5						
29-Aug-11	45	23.0	7.57	4.9	263.2					
		23.0	7.72	6.1	267.6					
30-Aug-11	46	22.8		4.9						
		22.8		4.9						
31-Aug-11	47	22.5	7.73	5.3						
		22.5	7.67	4.1						
1-Sep-11	48	22.6		4.6						
		22.6		5.0						
2-Sep-11	49	22.8	7.75	4.4						
		22.8	7.70	4.7						
3-Sep-11	50	22.6	7.70	5.5	265.1	102	132	0.03	U	
Sediment Ended		22.6	7.56	5.1	263.1			0.03	U	
4-Sep-11	51									
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 60%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.31**	**4.7**	**143**	**59**	**73**	**0.33**		
Number		**102**	**48**	**92**	**20**	**3**	**3**	**4**		
Max #		**23.9**	**7.75**	**6.2**	**268**	**102**	**132**	**1.23**		
Min#		**22.5**	**7.03**	**2.5**	**91**	**34**	**44**	**0.03**		

MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
15-Jul-11	0	23.8	7.50	6.3	126.1	42	40	0.83		
		23.8	7.41	6.5	121.2					
16-Jul-11	1	23.8								
		23.8								
17-Jul-11	2	23.5								
		23.6								
18-Jul-11	3	23.5	7.07	4.8	102.7					
		23.5	7.05	4.5	106.6					
19-Jul-11	4	23.6		4.6						
		23.5		4.4						
20-Jul-11	5	23.2	7.17	3.9						
		23.2	7.17	4.3						
21-Jul-11	6	23.3								
		23.3								
22-Jul-11	7	23.2	7.12	4.0						
		23.2	7.15	4.2						
23-Jul-11	8	23.4								
		23.4								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	23.0	7.08	3.5	110.1					
		23.0	7.04	3.6	111.6					
26-Jul-11	11	23.3		3.5						
		23.3		4.1						
27-Jul-01	12	23.1	6.93	3.4						
		23.0	6.98	4.3						
28-Jul-11	13	23.2		5.8						
		23.2		4.9						
29-Jul-11	14	23.1	7.14	6.0						
		23.2	7.16	5.9						
30-Jul-11	15	23.4		5.3						
		23.4		5.7						
31-Jul-11	16	23.8		7.0						
		23.6		7.0						
1-Aug-11	17	23.6	7.04	4.6	85.7					
		23.7	7.05	4.8	85.5					
2-Aug-11	18	23.5		4.9						
		23.4		4.7						
3-Aug-11	19	23.2	7.18	5.2						
		23.2	7.24	5.6						
4-Aug-11	20	22.9	7.12	4.7	93.4	32	40	0.04	J	
		22.8	7.19	4.9	94.6					
5-Aug-11	21	22.7	7.16	5.3						
		22.6	7.16	5.6						
6-Aug-11	22	22.7		4.4						
		22.7		4.5						
7-Aug-11	23	22.7		5.0						
		22.7		5.4						
8-Aug-11	24	22.8	7.32	5.1	105.4					
		22.8	7.34	5.1	102.5					
9-Aug-11	25	22.6		6.2						
		22.6		6.1						
10-Aug-11	26	22.7	7.43	4.1						
		22.7	7.37	4.3						
11-Aug-11	27	22.5		6.0						
		22.5		6.2						
12-Aug-11	28	22.9	7.17	4.4						
		22.8	7.14	4.6						
13-Aug-11	29	22.7		4.5						
		22.7		4.9						
14-Aug-11	30	23.0		4.5						
		22.9		4.9						
15-Aug-11	31	22.4	7.21	4.9	104.9					
		22.4	7.23	5.1	104.8					
16-Aug-11	32	22.9		5.7						
		22.9		5.7						
17-Aug-11	33	22.8	7.30	4.6						
		22.8	7.36	5.0						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
18-Aug-11	34	22.6		4.3						
		22.6		4.2						
19-Aug-11	35	22.8	7.39	4.3						
		22.8	7.42	4.0						
20-Aug-11	36	22.7		4.5						
		22.7		4.2						
21-Aug-11	37	22.7		3.9						
		22.8		4.0						
22-Aug-11	38	22.8	7.56	6.0	157.8					
		22.8	7.62	6.2	153.6					
23-Aug-11	39	23.1		4.9						
		23.2		4.6						
24-Aug-11	40	23.0	7.55	4.4						
		23.0	7.59	4.2						
25-Aug-11	41	23.1		5.0						
		23.1		4.7						
26-Aug-11	42	22.8	7.63	4.8						
		22.8	7.62	4.9						
27-Aug-11	43	22.9		4.1						
		22.8		4.5						
28-Aug-11	44	22.7		4.6						
		22.7		3.0						
29-Aug-11	45	23.0	7.72	5.0	269.4					
		23.0	7.70	4.9	264.8					
30-Aug-11	46	22.8		4.6						
		22.8		4.8						
31-Aug-11	47	22.5	7.75	4.7						
		22.5	7.71	4.4						
1-Sep-11	48	22.6		5.3						
		22.6		5.2						
2-Sep-11	49	22.9	7.71	5.0						
		22.8	7.77	4.6						
3-Sep-11	50	22.6		4.7						
		22.7		4.9						
4-Sep-11	51	22.9	7.74	4.4	273.4	104	128	0.00	U	
Sediment Ended		22.8	7.70	4.3	274.0					
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 80%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comments
Mean		**23.0**	**7.34**	**4.8**	**142**	**59**	**69**	**0.29**		
Number		**104**	**48**	**94**	**20**	**3**	**3**	**3**		
Max #		**23.8**	**7.77**	**7.0**	**274**	**104**	**128**	**0.83**		
Min#		**22.4**	**6.93**	**3.0**	**86**	**32**	**40**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comment
15-Jul-11	0	23.8	7.69	6.6	126.1	38	52	0.45		
		23.8	7.70	6.7	120.3	40	48	0.44	DUP	
16-Jul-11	1	23.8								
		23.8								
17-Jul-11	2	23.6								
		23.6								
18-Jul-11	3	23.5	7.08	4.4	108.8					
		23.5	7.11	4.6	106.9					
19-Jul-11	4	23.5		4.7						
		23.5		4.5						
20-Jul-11	5	23.2	7.18	3.6						
		23.2	7.13	4.2						
21-Jul-11	6	23.2								
		23.2								
22-Jul-11	7	23.2	7.17	4.0						
		23.2	7.18	3.6						
23-Jul-11	8	23.4								
		23.4								
24-Jul-11	9	23.3								
		23.3								
25-Jul-11	10	23.0	7.13	3.8	112.8					
		23.0	7.16	3.9	110.8					
26-Jul-11	11	23.3		4.3						
		23.3		3.4						
27-Jul-01	12	23.0	7.07	4.6						
		23.0	7.11	5.3						
28-Jul-11	13	23.2		6.3						
		23.2		5.5						
29-Jul-11	14	23.1	7.12	6.0						
		23.2	7.13	6.0						
30-Jul-11	15	23.3		5.7						
		23.3		6.0						
31-Jul-11	16	23.7		7.5						
		23.6		7.4						
1-Aug-11	17	23.5	7.08	5.2	86.5					
		23.6	7.08	5.4	84.8					
2-Aug-11	18	23.4		5.0						
		23.4		5.4						
3-Aug-11	19	23.0	7.19	5.4						
		23.0	7.22	5.6						
4-Aug-11	20	22.8	7.07	5.5	93.9	30	36	0.04	J	
		22.8	7.10	6.0	93.2					
5-Aug-11	21	22.7	7.15	5.6						
		22.7	7.14	5.6						
6-Aug-11	22	22.7		4.8						
		22.7		5.0						
7-Aug-11	23	22.7		5.5						
		22.8		5.5						
8-Aug-11	24	22.8	7.29	5.7	99.4					
		22.8	7.32	5.9	99.9					
9-Aug-11	25	22.6		6.1						
		22.6		6.3						
10-Aug-11	26	22.7	7.31	4.4						
		22.7	7.30	4.0						
11-Aug-11	27	22.5		6.0						
		22.5		5.7						
12-Aug-11	28	22.9	7.19	5.1						
		22.9	7.21	5.2						
13-Aug-11	29	22.7		5.0						
		22.7		4.6						
14-Aug-11	30	22.8		5.2						
		22.8		4.6						
15-Aug-11	31	22.5	7.22	5.3	98.8					
		22.4	7.17	5.2	99.1					
16-Aug-11	32	22.8		6.0						
		22.8		5.7						
17-Aug-11	33	22.8	7.29	5.0						
		22.8	7.30	5.0						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comment
18-Aug-11	34	22.5		4.3						
		22.4		4.2						
19-Aug-11	35	22.8	7.28	4.4						
		22.8	7.33	4.8						
20-Aug-11	36	22.7		4.5						
		22.6		4.3						
21-Aug-11	37	22.7		4.0						
		22.7		4.1						
22-Aug-11	38	22.8	7.43	5.9	147.6					
		22.8	7.45	6.0	147.3					
23-Aug-11	39	23.1		4.7						
		23.1		4.4						
24-Aug-11	40	23.0	7.53	4.8						
		23.1	7.52	4.7						
25-Aug-11	41	23.0		4.8						
		23.0		5.9						
26-Aug-11	42	22.8	7.64	5.8						
		22.8	7.72	4.2						
27-Aug-11	43	22.8		4.6						
		22.8		3.5						
28-Aug-11	44	22.7		3.6						
		22.7		4.0						
29-Aug-11	45	23.0	7.65	5.0	262.2					
		23.0	7.62	4.9	262.3					
30-Aug-11	46	22.8		4.8						
		22.8		4.0						
31-Aug-11	47	22.5	7.59	4.2						
		22.5	7.58	4.0						
1-Sep-11	48	22.6		5.7						
		22.6		5.7						
2-Sep-11	49	22.8	7.70	5.1						
		22.9	7.74	5.4						
3-Sep-11	50	22.7		5.4						
		22.7		5.2						
4-Sep-11	51	22.9	7.60	4.4	267.0	100	128	0.00	U	
Sediment Ended		22.9	7.56	4.4	264.3					
5-Sep-11	52									
6-Sep-11	53									
7-Sep-11	54									
8-Sep-11	55									
9-Sep-11	56									
10-Sep-11	57									
11-Sep-11	58									
12-Sep-11	59									

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 100%

Test Dates: July 15-September 14, 2011

Test Type: Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

Test Species: *Chironomus dilutus*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code	Comment
Mean		**23.0**	**7.32**	**5.0**	**140**	**52**	**66**	**0.23**		
Number		**104**	**48**	**94**	**20**	**4**	**4**	**4**		
Max #		**23.8**	**7.74**	**7.5**	**267**	**100**	**128**	**0.45**		
Min#		**22.4**	**7.07**	**3.4**	**85**	**30**	**36**	**0.00**		

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)
NA = Not Applicable

*Data enter wrong

Appendix C 2
Overlying Water Quality Summaries

- *Hyalella azteca*

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Data Entry

Date	Initials	Data Entry
7/13/11	MLL	Day 0-1
7/20/2011	NS	days 2-6
8/3/11	MLL	Days 7-20
8/10/2011	eb	days 21-28
8/25/11	KN	Survival, Weight, Biomass

100% QC Check of Data

8/16-18/2011	DS	Day 0-27
8/25/11	DS	day 28 Survival, Weight, Biomass

10% QC Check of Data

9/1/2011	JB

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: GLW Water Only

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.0	8.21	8.1	285.3	104	136	0.01	U
		23.2	8.22	8.2	295.4				
13-Jul-11	1	23.5	7.74	5.5					
		23.5	7.71	5.2					
14-Jul-11	2	23.2		7.0					
		23.2		7.3					
15-Jul-11	3	22.9	7.85	6.8					
		22.9	7.83	7.2					
16-Jul-11	4	23.5							
		23.3							
17-Jul-11	5	23.5							
		23.5							
18-Jul-11	6	23.0	7.92	6.7	300				
		23.0	7.89	6.7	300				
19-Jul-11	7	22.9							
		22.8							
20-Jul-11	8	23.0	7.82	6.9					
		23.0	7.85	6.5					
21-Jul-11	9	23.2							
		23.6							
22-Jul-11	10	23.2	7.86	6.6					
		23.2	7.84	6.9					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.7	7.93	6.8	302				
		23.7	7.98	7.1	301				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.3	7.92	6.7					
		23.4	7.83	6.4					
28-Jul-11	16	23.2							
		23.2							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: GLW Water Only

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	7.77	6.6					
		23.1	7.85	7.4					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.6							
1-Aug-11	20	23.7	7.91	6.2	305				
		23.7	7.96	6.7	303				
2-Aug-11	21	23.3							
		23.4							
3-Aug-11	22	22.7	7.97	7.2					
		22.8	7.99	7.2					
4-Aug-11	23	23.1							
		23.0							
5-Aug-11	24	22.7	7.92	7.0					
		22.7	7.87	7.2					
6-Aug-11	25	22.4		6.8					
		22.5		6.9					
7-Aug-11	26	22.8							
		22.8							
8-Aug-11	27	22.8	7.66	4.3	306				
		22.8	7.71	4.9	315				
9-Aug-11	28	22.6	7.80	6.6	303	106	136	0.04	J
		22.6	7.94	7.1	297				
Mean		**23.1**	**7.88**	**6.7**	**301**	**105**	**136**	**0.03**	
Number		**58**	**28**	**32**	**12**	**2**	**2**	**2**	
Max #		**23.7**	**8.22**	**8.2**	**315**	**106**	**136**	**0.04**	
Min#		**22.4**	**7.66**	**4.3**	**285**	**104**	**136**	**0.01**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: LCS+GLW

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	7.63	5.3	354	134	168	0.59	
		23.5	7.58	5.4	359				
13-Jul-11	1	23.5	7.57	4.3					
		23.5	7.61	4.2					
14-Jul-11	2	23.2		5.1					
		23.2		4.9					
15-Jul-11	3	22.9	7.75	4.5					
		22.9	7.79	5.3					
16-Jul-11	4	23.3							
		23.5							
17-Jul-11	5	23.5							
		23.5							
18-Jul-11	6	23.0	7.67	4.4	317				
		23.0	7.64	4.5	321				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	23.0	7.57	4.9					
		23.0	7.71	5.0					
21-Jul-11	9	23.3							
		23.3							
22-Jul-11	10	23.2	7.62	4.4					
		23.2	7.74	5.0					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.7	7.97	4.6	314				
		23.7	7.92	4.7	325				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.4	8.05	4.3					
		23.4	7.74	4.3					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: LCS+GLW

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.2	7.74	3.6					
		23.1	7.76	4.6					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.4							
		23.4							
1-Aug-11	20	23.7	7.72	3.9	329				
		23.6	7.79	4.2	318				
2-Aug-11	21	23.3							
		23.3							
3-Aug-11	22	22.6	7.83	4.4					
		22.6	7.81	4.5					
4-Aug-11	23	22.7							
		22.7							
5-Aug-11	24	22.6	7.58	3.6					
		22.7	7.70	4.7					
6-Aug-11	25	22.4							
		22.4							
7-Aug-11	26	22.8							
		22.8							
8-Aug-11	27	22.8	7.72	7.1	298				
		22.8	7.89	7.0	300				
9-Aug-11	28	22.5	7.62	4.1	332	114	140	0.00	U
		22.6	7.70	4.5	329				
Mean		**23.1**	**7.73**	**4.7**	**325**	**124**	**154**	**0.30**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.7**	**8.05**	**7.1**	**359**	**134**	**168**	**0.59**	
Min#		**22.4**	**7.57**	**3.6**	**298**	**114**	**140**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: LCS+ERW

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.1	7.59	5.0	283.4	106	136	0.66	
		23.2	7.61	5.1	274.8				
13-Jul-11	1	23.1	7.23	4.5					
		23.2	7.28	4.9					
14-Jul-11	2	23.2		4.6					
		23.0		4.6					
15-Jul-11	3	23.1	7.41	4.4					
		22.9	7.25	4.2					
16-Jul-11	4	23.2							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.2	7.14	4.0	133.1				
		23.2	7.24	4.6	129.9				
19-Jul-11	7	23.1							
		23.1							
20-Jul-11	8	23.0	7.09	5.3					
		23.0	7.13	4.6					
21-Jul-11	9	23.0							
		23.1							
22-Jul-11	10	23.1	7.36	4.3					
		23.2	7.33	4.0					
23-Jul-11	11	23.0							
		23.0							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.7	6.98	3.6	130.0				
		23.7	7.17	4.5	129.0				
26-Jul-11	14	23.2							
		23.2							
27-Jul-01	15	22.8	7.45	4.7					
		22.8	7.65	4.4					
28-Jul-11	16	23.0							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: LCS+ERW

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	7.18	4.5					
		23.0	7.20	4.6					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.8							
		23.7							
1-Aug-11	20*	24.3	7.38	5.1	126.6				
	*	24.3	7.40	4.4	132.0				
		23.8							
		23.8							
2-Aug-11	21	22.2							
		22.2							
3-Aug-11	22	22.1	7.34	4.4					
		22.1	7.30	4.1					
4-Aug-11	23	22.0							
		22.1							
5-Aug-11	24	22.1	7.17	4.0					
		22.1	7.15	3.9					
6-Aug-11	25	22.3							
		22.0							
7-Aug-11	26	22.8							
		22.8							
8-Aug-11	27	23.0	7.04	3.8	118.2				
		23.1	7.13	3.4	108.2				
9-Aug-11	28	22.6	7.06	3.2	127.7	48	88	0.05	J
		22.6	7.09	3.3	128.9				
Mean		**23.0**	**7.26**	**4.3**	**152**	**77**	**112**	**0.36**	
Number		**60**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**24.3**	**7.65**	**5.3**	**283**	**106**	**136**	**0.66**	
Min#		**22.0**	**6.98**	**3.2**	**108**	**48**	**88**	**0.05**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERS(8981)+ERW

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.1	7.21	5.1	218.0	80	96	1.59	
		23.2	7.18	4.9	213.4				
13-Jul-11	1	23.3	6.98	4.9					
		23.3	6.95	5.0					
14-Jul-11	2	23.2		5.0					
		23.2		5.0					
15-Jul-11	3	23.1	6.98	4.3					
		23.1	6.94	4.1					
16-Jul-11	4	23.5							
		23.5							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.2	6.98	4.9	96.3				
		23.2	7.00	5.2	95.5				
19-Jul-11	7	23.1							
		23.2							
20-Jul-11	8	23.0	7.06	4.9					
		23.0	7.22	5.1					
21-Jul-11	9	23.1							
		23.1							
22-Jul-11	10	23.2	7.59	4.1					
		23.2	7.41	4.0					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.6	7.32	3.8	127.1				
		23.6	7.35	4.5	127.3				
26-Jul-11	14	23.2							
		23.2							
27-Jul-01	15	22.9	7.40	4.7					
		22.9	7.15	4.5					
28-Jul-11	16	23.0							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERS(8981)+ERW

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	7.10	5.2					
		23.0	7.04	5.2					
30-Jul-11	18	23.7							
		23.6							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20*	24.1	7.09	5.5	90.3				
	*	24.0	7.03	5.2	91.5				
		23.8							
		23.8							
2-Aug-11	21	22.2							
		22.1							
3-Aug-11	22	22.1	7.09	6.0					
		22.2	7.12	6.2					
4-Aug-11	23	22.1							
		22.1							
5-Aug-11	24	22.1	6.93	5.0					
		22.1	6.93	5.0					
6-Aug-11	25	22.2							
		22.1							
7-Aug-11	26	22.7							
		22.8							
8-Aug-11	27	23.0	6.98	4.9	90.5				
		23.0	6.97	4.9	90.7				
9-Aug-11	28	22.6	6.95	5.2	91.7	32	48	0.04	J
		22.6	6.95	5.2	91.5	30	48		
Mean		**23.1**	**7.10**	**4.9**	**119**	**47**	**64**	**0.82**	
Number		**60**	**28**	**30**	**12**	**3**	**3**	**2**	
Max #		**24.1**	**7.59**	**6.2**	**218**	**80**	**96**	**1.59**	
Min#		**22.1**	**6.93**	**3.8**	**90**	**30**	**48**	**0.04**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.3	7.07	5.3	129.5	58	64	1.40	
		23.2	7.05	4.8	129.6				
13-Jul-11	1	23.3	6.95	5.2					
		23.3	6.96	4.8					
14-Jul-11	2	23.2		4.8					
		23.1		4.5					
15-Jul-11	3	23.0	7.00	4.4					
		23.1	7.04	4.3					
16-Jul-11	4	23.5							
		23.3							
17-Jul-11	5	23.5							
		23.3							
18-Jul-11	6	23.2	7.06	5.4	93.5				
		23.2	7.01	5.2	96.6				
19-Jul-11	7	23.2							
		23.2							
20-Jul-11	8	23.0	7.15	4.6					
		23.0	7.28	5.1					
21-Jul-11	9	23.1							
		23.1							
22-Jul-11	10	23.3	7.53	4.5					
		23.2	7.59	4.0					
23-Jul-11	11	23.1							
		23.1							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.13	4.6	112.0				
		23.6	7.19	3.8	128.1				
26-Jul-11	14	23.2							
		23.2							
27-Jul-01	15	22.9	7.10	4.6					
		22.8	7.11	4.7					
28-Jul-11	16	23.0							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	6.90	5.0					
		23.0	6.83	4.4					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.8							
1-Aug-11	20*	24.1	7.05	5.6	86.8				
	*	24.0	7.03	5.5	87.2				
		23.8							
		23.9							
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.2	7.11	5.0					
		22.3	7.03	4.7					
4-Aug-11	23	22.2							
		22.2							
5-Aug-11	24	22.1	7.05	5.3					
		22.1	6.95	5.0					
6-Aug-11	25	22.2							
		22.2							
7-Aug-11	26	22.6							
		22.6							
8-Aug-11	27	23.0	7.05	4.8	94.8				
		23.0	7.04	5.0	91.8				
9-Aug-11	28	22.6	7.01	5.1	93.8	34	44	0.03	U
		22.6	6.98	4.8	94.4				
Mean		**23.1**	**7.08**	**4.8**	**103**	**46**	**54**	**0.72**	
Number		**60**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**24.1**	**7.59**	**5.6**	**130**	**58**	**64**	**1.40**	
Min#		**22.1**	**6.83**	**3.8**	**87**	**34**	**44**	**0.03**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.3	7.40	6.5	237.4	28	60	1.43	
		23.3	7.07	5.0	115.5				
13-Jul-11	1	23.3	6.97	5.0					
		23.5	6.92	5.0					
14-Jul-11	2	23.3		4.8					
		23.3		5.2					
15-Jul-11	3	23.2	6.88	4.5					
		23.2	6.86	4.9					
16-Jul-11	4	23.5							
		23.5							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.2	7.03	5.0	96.7				
		23.2	6.98	5.1	93.7				
19-Jul-11	7	23.2							
		23.2							
20-Jul-11	8	23.0	7.15	4.8					
		23.0	6.99	4.2					
21-Jul-11	9	23.1							
		23.1							
22-Jul-11	10	23.3	7.69	3.9					
		23.3	7.81	4.9					
23-Jul-11	11	23.0							
		23.0							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.6	7.64	4.1	127.6				
		23.6	7.57	4.3	130.5				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	22.9	7.16	5.2					
		22.9	7.21	4.9					
28-Jul-11	16	23.0							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.01	5.9					
		23.0	6.97	5.5					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20*	24.1	7.12	5.8	92.3				
	*	24.1	7.19	5.0	98.0				
		23.8							
		23.9							
2-Aug-11	21	22.2							
		22.2							
3-Aug-11	22	22.2	7.09	5.6					
		22.2	6.98	4.3					
4-Aug-11	23	22.2							
		22.2							
5-Aug-11	24	22.1	7.13	6.6					
		22.1	7.22	4.2					
6-Aug-11	25	22.2							
		22.2							
7-Aug-11	26	22.6							
		22.6							
8-Aug-11	27	23.0	7.04	5.1	93.0				
		23.0	7.02	4.8	92.8				
9-Aug-11	28	22.6	7.06	4.8	99.6	32	44	0.01	U
		22.6	7.07	4.8	98.3				
Mean		**23.1**	**7.15**	**5.0**	**115**	**30**	**52**	**0.72**	
Number		**60**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**24.1**	**7.81**	**6.6**	**237**	**32**	**60**	**1.43**	
Min#		**22.1**	**6.86**	**3.9**	**92**	**28**	**44**	**0.01**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.3	7.39	6.5	233.0	56	80	1.44	
		23.2	7.17	5.7	122.9			1.45	
13-Jul-11	1	23.3	6.94	5.2					
		23.3	6.96	5.2					
14-Jul-11	2	23.3		4.9					
		23.3		4.9					
15-Jul-11	3	23.2	6.99	4.5					
		23.2	6.93	4.9					
16-Jul-11	4	23.5							
		23.5							
17-Jul-11	5	23.5							
		23.5							
18-Jul-11	6	23.2	7.00	5.5	94.6				
		23.3	7.05	5.2	97.5				
19-Jul-11	7	23.2							
		23.2							
20-Jul-11	8	23.1	7.19	4.8					
		23.0	7.14	5.3					
21-Jul-11	9	23.2							
		23.1							
22-Jul-11	10	23.4	7.55	4.0					
		23.3	7.63	4.2					
23-Jul-11	11	23.0							
		23.1							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.59	4.4	133.2				
		23.5	7.38	4.4	119.7				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	22.9	7.28	5.4					
		22.9	7.38	6.2					
28-Jul-11	16	23.0							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	7.12	6.1					
		23.0	7.06	5.1					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20*	24.2	7.15	5.6	92.7				
	*	24.1	7.24	5.8	95.1				
		23.7							
		23.8							
2-Aug-11	21	22.2							
		22.1							
3-Aug-11	22	22.2	7.24	5.4					
		22.2	7.33	6.4					
4-Aug-11	23	22.2							
		22.1							
5-Aug-11	24	22.2	7.13	5.6					
		22.1	7.20	5.4					
6-Aug-11	25	22.1							
		22.2							
7-Aug-11	26	22.6							
		22.7							
8-Aug-11	27	23.0	7.14	5.1	97.8				
		23.0	7.26	4.7	102.2				
9-Aug-11	28	22.6	7.08	4.8	97.0	38	48	0.02	U
		22.6	7.13	5.4	102.4				
Mean		**23.1**	**7.20**	**5.2**	**116**	**47**	**64**	**0.97**	
Number		**60**	**28**	**30**	**12**	**2**	**2**	**3**	
Max #		**24.2**	**7.63**	**6.5**	**233**	**56**	**80**	**1.45**	
Min#		**22.1**	**6.93**	**4.0**	**93**	**38**	**48**	**0.02**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.2	7.13	5.4	115.3	50	48	1.59	
		23.3	7.20	5.6	123.5				
13-Jul-11	1	23.3	6.95	5.2					
		23.3	6.96	5.3					
14-Jul-11	2	23.5		5.2					
		23.3		5.0					
15-Jul-11	3	23.1	6.94	4.4					
		23.1	6.96	4.4					
16-Jul-11	4	23.5							
		23.5							
17-Jul-11	5	23.5							
		23.5							
18-Jul-11	6	23.3	7.05	5.4	94.2				
		23.2	7.06	4.9	94.3				
19-Jul-11	7	23.2							
		23.2							
20-Jul-11	8	23.0	7.21	4.9					
		23.0	7.37	4.6					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.3	7.85	4.2					
		23.4	7.77	3.8					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.46	4.0	124.6				
		23.5	7.42	3.8	118.2				
26-Jul-11	14	23.2							
		23.2							
27-Jul-01	15	22.9	7.37	5.6					
		22.9	7.39	5.1					
28-Jul-11	16	23.0							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.11	5.3					
		23.0	7.09	6.3					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20*	24.1	7.29	5.8	97.6				
		23.9	7.25	5.6	101.7				
		23.8							
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.3	7.26	5.8					
		22.2	7.27	5.7					
4-Aug-11	23	22.2							
		22.2							
5-Aug-11	24	22.1	7.22	5.9					
		22.1	7.24	5.0					
6-Aug-11	25	22.1							
		22.2							
7-Aug-11	26	22.6							
		22.6							
8-Aug-11	27	23.0	7.25	5.3	98.8				
		23.0	7.20	5.5	99.0				
9-Aug-11	28	22.6	7.51	4.9	117.8	42	56	0.01	U
		22.6	7.26	5.4	105.4				
Mean		**23.1**	**7.25**	**5.1**	**108**	**46**	**52**	**0.80**	
Number		**59**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**24.1**	**7.85**	**6.3**	**125**	**50**	**56**	**1.59**	
Min#		**22.1**	**6.94**	**3.8**	**94**	**42**	**48**	**0.01**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.3	7.22	5.4	116.7	52	56	1.00	
		23.3	7.26	5.7	119.0				
13-Jul-11	1	23.3	6.98	5.3					
		23.3	7.03	5.2					
14-Jul-11	2	23.2		5.0					
		23.1		5.3					
15-Jul-11	3	23.1	7.01	4.9					
		23.1	7.00	4.6					
16-Jul-11	4	23.5							
		23.5							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.3	7.08	5.1	100.9				
		23.3	7.09	5.2	97.3				
19-Jul-11	7	23.2							
		23.2							
20-Jul-11	8	23.0	7.31	4.7					
		23.0	7.28	4.9					
21-Jul-11	9	23.2							
		23.1							
22-Jul-11	10	23.3	7.86	4.3					
		23.4	7.77	4.4					
23-Jul-11	11	23.2							
		23.3							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.48	4.1	127.1				
		23.5	7.45	3.9	121.3				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	22.9	7.39	5.1					
		22.9	7.40	5.4					
28-Jul-11	16	23.0							
		22.8							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	22.9	7.28	5.6					
		22.9	7.30	5.0					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20	23.9	7.38	5.4	107.2				
		23.9	7.36	5.5	99.0				
2-Aug-11	21	22.1							
		22.2							
3-Aug-11	22	22.2	7.47	5.4					
		22.3	7.46	5.4					
4-Aug-11	23	22.2							
		22.1							
5-Aug-11	24	22.2	7.27	6.2					
		22.2	7.30	6.1					
6-Aug-11	25	22.0							
		22.1							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	23.0	7.31	5.6	102.8				
		23.0	7.39	5.3	108.3				
9-Aug-11	28	22.6	7.33	5.2	113.3	42	56	0.46	
		22.6	7.45	5.5	115.4				
Mean		**23.0**	**7.32**	**5.2**	**111**	**47**	**56**	**0.73**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.9**	**7.86**	**6.2**	**127**	**52**	**56**	**1.00**	
Min#		**22.0**	**6.98**	**3.9**	**97**	**42**	**56**	**0.46**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.3	7.37	6.0	155.0	56	64	1.04	
		23.2	7.35	5.6	132.7				
13-Jul-11	1	23.3	7.10	5.3					
		23.3	7.09	5.2					
14-Jul-11	2	23.3		5.3					
		23.3		5.1					
15-Jul-11	3	23.1	7.01	4.4					
		23.1	6.97	4.9					
16-Jul-11	4	23.5							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.2	7.15	5.4	97.1				
		23.2	7.12	4.8	97.7				
19-Jul-11	7	23.2							
		23.1							
20-Jul-11	8	23.0	7.33	4.6					
		23.0	7.32	4.7					
21-Jul-11	9	23.1							
		23.0							
22-Jul-11	10	23.1	7.68	4.4					
		23.1	7.71	4.6					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.6	7.48	4.0	123.3				
		23.5	7.53	4.1	119.3				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	22.9	7.50	5.2					
		22.9	7.53	5.7					
28-Jul-11	16	22.9							
		22.9							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	22.9	7.42	5.7					
		22.9	7.46	5.6					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.6							
1-Aug-11	20	23.9	7.58	5.6	115.7				
		23.9	7.60	5.7	111.8				
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.3	7.68	5.2					
		22.3	7.82	4.8					
4-Aug-11	23	22.1							
		22.1							
5-Aug-11	24	22.2	7.51	5.1					
		22.1	7.47	5.4					
6-Aug-11	25	22.0							
		22.1							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.9	7.50	5.4	109.9				
		23.0	7.68	5.1	117.1				
9-Aug-11	28	22.6	7.62	5.9	127.9	46	56	0.02	U
		22.6	7.70	5.1	127.7				
Mean		**23.0**	**7.44**	**5.1**	**120**	**51**	**60**	**0.53**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.9**	**7.82**	**6.0**	**155**	**56**	**64**	**1.04**	
Min#		**22.0**	**6.97**	**4.0**	**97**	**46**	**56**	**0.02**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.2	7.13	5.4	125.5	58	60	1.34	
		23.2	7.17	5.5	148.0				
13-Jul-11	1	23.1	7.02	5.3					
		23.2	7.03	5.1					
14-Jul-11	2	23.3		5.2					
		23.3		4.9					
15-Jul-11	3	23.0	7.06	4.3					
		23.0	7.04	4.8					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.1	7.08	5.2	99.4				
		23.1	7.04	5.5	95.2				
19-Jul-11	7	23.2							
		23.1							
20-Jul-11	8	23.0	7.19	4.2					
		23.0	7.40	4.4					
21-Jul-11	9	23.1							
		23.1							
22-Jul-11	10	23.3	8.07	4.6					
		23.3	7.88	4.6					
23-Jul-11	11	23.1							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.4	7.61	3.9	140.8				
		23.5	7.66	5.0	126.5				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	22.9	7.35	5.2					
		22.8	7.22	4.6					
28-Jul-11	16	22.9							
		22.9							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	22.9	7.04	5.3					
		22.9	7.01	5.7					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20	23.8	7.13	5.5	95.2				
		23.8	7.06	5.2	92.6				
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.2	7.14	5.1					
		22.2	7.23	5.1					
4-Aug-11	23	22.1							
		22.1							
5-Aug-11	24	22.1	7.06	5.7					
		22.1	7.01	4.7					
6-Aug-11	25	22.1							
		22.1							
7-Aug-11	26	22.8							
		22.7							
8-Aug-11	27	22.9	7.12	5.4	95.0				
		22.9	7.11	5.3	96.2				
9-Aug-11	28	22.6	7.08	5.4	98.8	34	48	0.04	J
		22.6	7.05	5.0	98.7				
Mean		**23.0**	**7.21**	**5.0**	**109**	**46**	**54**	**0.69**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.8**	**8.07**	**5.7**	**148**	**58**	**60**	**1.34**	
Min#		**22.1**	**7.01**	**3.9**	**93**	**34**	**48**	**0.04**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.2	7.17	5.3	125.1	56	56	1.56	
		23.2	7.26	5.7	139.8				
13-Jul-11	1	23.2	7.07	5.3					
		23.2	6.94	5.3					
14-Jul-11	2	23.3		5.3					
		23.3		5.0					
15-Jul-11	3	23.1	7.02	4.2					
		23.1	7.03	4.8					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.1	7.13	5.3	102.2				
		23.1	7.10	5.4	98.3				
19-Jul-11	7	23.1							
		23.2							
20-Jul-11	8	22.9	7.36	4.2					
		23.0	7.41	4.0					
21-Jul-11	9	23.1							
		23.1							
22-Jul-11	10	23.3	7.90	4.3					
		23.3	7.79	4.0					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.4	7.65	4.3	132.8				
		23.5	7.86	4.1	127.9				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	22.9	7.35	5.0					
		22.9	7.37	5.0					
28-Jul-11	16	22.9							
		22.9							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	22.9	7.20	4.9					
		22.9	7.16	4.7					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.6							
		23.7							
1-Aug-11	20	23.9	7.24	5.5	100.1				
	*	24.0	7.12	5.8	94.3				
		23.7							
2-Aug-11	21	22.1							
		22.2							
3-Aug-11	22	22.2	7.31	5.3					
		22.2	7.24	6.2					
4-Aug-11	23	22.1							
		22.1							
5-Aug-11	24	22.1	7.07	5.4					
		22.1	7.08	5.3					
6-Aug-11	25	22.1							
		22.1							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.9	7.31	5.3	103.5				
		22.9	7.21	5.5	98.2				
9-Aug-11	28	22.6	7.20	5.2	106.0	38	48	0.00	U
		22.6	7.17	5.0	102.8				
Mean		**23.0**	**7.28**	**5.0**	**111**	**47**	**52**	**0.78**	
Number		**59**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**24.0**	**7.90**	**6.2**	**140**	**56**	**56**	**1.56**	
Min#		**22.1**	**6.94**	**4.0**	**94**	**38**	**48**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.2	7.33	5.8	135.2	52	48	1.61	
		23.2	7.33	5.9	131.6				
13-Jul-11	1	23.3	7.16	5.4					
		23.3	7.21	5.4					
14-Jul-11	2	23.3		5.1					
		23.3		5.4					
15-Jul-11	3	23.1	6.99	4.6					
		23.1	7.06	5.1					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.1	7.18	5.3	104.9				
		23.2	7.18	5.5	100.6				
19-Jul-11	7	23.2							
		23.2							
20-Jul-11	8	23.0	7.40	4.7					
		23.0	7.39	4.2					
21-Jul-11	9	23.1							
		23.0							
22-Jul-11	10	23.3	7.96	4.2					
		23.3	7.77	3.9					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.6	7.68	4.1	131.6				
		23.6	7.77	4.2	135.1				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	22.9	7.43	4.5					
		22.9	7.47	5.6					
28-Jul-11	16	23.0							
		22.9							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	7.20	5.7					
		23.0	7.22	4.9					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.6							
		23.7							
1-Aug-11	20	23.9	7.37	6.3	100.0				
		23.9	7.33	5.9	104.2				
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.2	7.19	5.5					
		22.2	7.27	5.6					
4-Aug-11	23	22.1							
		22.1							
5-Aug-11	24	22.1	7.32	5.9					
		22.1	7.26	5.5					
6-Aug-11	25	22.1							
		22.1							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.9	7.05	5.5	98.5				
		22.9	7.13	5.4	101.3				
9-Aug-11	28	22.6	7.22	5.2	106.1	38	52	0.00	U
		22.6	7.18	5.2	103.8				
Mean		**23.0**	**7.32**	**5.2**	**113**	**45**	**50**	**0.81**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.9**	**7.96**	**6.3**	**135**	**52**	**52**	**1.61**	
Min#		**22.1**	**6.99**	**3.9**	**99**	**38**	**48**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.2	7.46	5.8	134.2	56	56	1.13	
		23.1	7.48	6.0	138.8				
13-Jul-11	1	23.3	7.28	5.7					
		23.3	7.33	5.8					
14-Jul-11	2	23.3		5.7					
		23.3		5.6					
15-Jul-11	3	23.1	7.16	4.9					
		23.1	7.13	5.3					
16-Jul-11	4	23.5							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.2	7.24	5.5	105.9				
		23.1	7.25	5.7	103.9				
19-Jul-11	7	23.1							
		23.1							
20-Jul-11	8	22.8	7.32	5.3					
		22.8	7.33	5.4					
21-Jul-11	9	23.0							
		23.0							
22-Jul-11	10	23.3	7.70	5.1					
		23.3	7.67	4.9					
23-Jul-11	11	23.1							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.83	4.3	131.9				
		23.6	7.81	4.5	126.3				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	22.8	7.61	5.9					
		22.9	7.62	5.9					
28-Jul-11	16	22.9							
		22.9							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	7.28	5.9					
		23.0	7.29	6.1					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20*	24.1	7.43	5.9	107.2				
		23.9	7.38	6.1	100.2				
		23.9							
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.2	7.31	5.9					
		22.2	7.37	6.1					
4-Aug-11	23	22.1							
		22.1							
5-Aug-11	24	22.2	7.29	6.0					
		22.2	7.23	5.5					
6-Aug-11	25	22.1							
		22.2							
7-Aug-11	26	22.6							
		22.6							
8-Aug-11	27	22.9	7.26	6.2	100				
		22.9	7.29	6.3	101.1				
9-Aug-11	28	22.6	7.38	5.7	112.1	40	60	0.00	U
		22.6	7.27	5.5	107.1				
Mean		**23.0**	**7.39**	**5.6**	**114**	**48**	**58**	**0.57**	
Number		**59**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**24.1**	**7.83**	**6.3**	**139**	**56**	**60**	**1.13**	
Min#		**22.1**	**7.13**	**4.3**	**100**	**40**	**56**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.1	7.70	6.3	162.3	62	72	0.89	
		23.1	7.71	6.3	147.4	60	68	0.85	
13-Jul-11	1	23.3	7.52	6.2					
		23.3	7.55	6.1					
14-Jul-11	2	23.3		5.9					
		23.2		5.9					
15-Jul-11	3	23.0	7.20	5.4					
		23.0	7.29	5.4					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.1	7.44	6.3	104.9				
		23.1	7.42	6.4	106.4				
19-Jul-11	7	23.1							
		23.1							
20-Jul-11	8	22.9	7.33	5.9					
		22.9	7.36	5.8					
21-Jul-11	9	23.0							
		23.0							
22-Jul-11	10	23.3	7.47	5.6					
		23.3	7.52	5.5					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.6	7.61	5.0	110.1				
		23.6	7.64	4.6	112.8				
26-Jul-11	14	23.2							
		23.1							
27-Jul-01	15	22.8	7.57	6.2					
		22.8	7.56	6.7					
28-Jul-11	16	22.9							
		22.9							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.0	7.36	6.5					
		23.1	7.44	6.9					
30-Jul-11	18	23.7							
		23.6							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20	23.9	7.48	6.8	105.7				
		23.9	7.54	6.7	104.8				
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.2	7.51	5.9					
		22.2	7.56	6.6					
4-Aug-11	23	22.1							
		22.2							
5-Aug-11	24	22.2	7.44	6.0					
		22.2	7.44	6.4					
6-Aug-11	25	22.2							
		22.1							
7-Aug-11	26	22.6							
		22.6							
8-Aug-11	27	22.9	7.40	6.3	104.3				
		22.9	7.46	6.4	110				
9-Aug-11	28	22.7	7.34	5.8	107.2	40	56	0.00	U
		22.6	7.28	5.8	108.3				
Mean		**23.0**	**7.47**	**6.1**	**115**	**54**	**65**	**0.58**	
Number		**58**	**28**	**30**	**12**	**3**	**3**	**3**	
Max #		**23.9**	**7.71**	**6.9**	**162**	**62**	**72**	**0.89**	
Min#		**22.1**	**7.20**	**4.6**	**104**	**40**	**56**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.1	7.87	6.6	141.6	54	72	0.63	
		23.1	7.94	6.7	146.1				
13-Jul-11	1	23.2	7.68	6.6					
		23.2	7.70	6.5					
14-Jul-11	2	23.3		6.4					
		23.3		6.4					
15-Jul-11	3	23.1	7.42	5.2					
		23.1	7.38	6.0					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.2							
		23.2							
18-Jul-11	6	23.1	7.47	6.4	108.3				
		23.1	7.53	6.5	107.9				
19-Jul-11	7	23.1							
		23.1							
20-Jul-11	8	22.9	7.42	6.2					
		22.9	7.40	5.9					
21-Jul-11	9	23.0							
		23.0							
22-Jul-11	10	23.3	7.54	6.0					
		23.3	7.51	6.1					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.50	4.6	108.2				
		23.4	7.53	4.7	112.1				
26-Jul-11	14	23.2		6.5					
		23.2		6.6					
27-Jul-01	15	22.8	7.38	6.5					
		22.8	7.43	6.8					
28-Jul-11	16	22.9							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.41	7.0					
		23.1	7.36	6.8					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.7							
		23.7							
1-Aug-11	20	23.9	7.49	6.8	99.2				
	*	24.0	7.46	6.8	99.4				
		23.8							
2-Aug-11	21	22.1							
		22.1							
3-Aug-11	22	22.2	7.47	6.7					
		22.2	7.42	6.2					
4-Aug-11	23	22.1							
		22.1							
5-Aug-11	24	22.2	7.38	6.5					
		22.2	7.34	6.5					
6-Aug-11	25	22.2							
		22.1							
7-Aug-11	26	22.6							
		22.7							
8-Aug-11	27	22.9	7.30	6.1	100.7				
		22.9	7.35	6.3	101.9				
9-Aug-11	28	22.6	7.25	5.3	105.8	36	48	0.00	U
		22.7	7.37	6.2	105.1				
Mean		**23.0**	**7.48**	**6.3**	**111**	**45**	**60**	**0.32**	
Number		**59**	**28**	**32**	**12**	**2**	**2**	**2**	
Max #		**24.0**	**7.94**	**7.0**	**146**	**54**	**72**	**0.63**	
Min#		**22.1**	**7.25**	**4.6**	**99**	**36**	**48**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

***temperature box adjusted, temperatures rechecked and within range at 10:00**

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	7.01	5.9	105.8	44	52	1.38	
		23.5	6.99	5.9	111.8				
13-Jul-11	1	23.5	7.15	5.1					
		23.5	7.11	4.8					
14-Jul-11	2	23.2		4.9					
		23.2		5.0					
15-Jul-11	3	23.0	7.36	4.6					
		23.0	7.21	4.5					
16-Jul-11	4	23.5							
		23.5							
17-Jul-11	5	23.5							
		23.5							
18-Jul-11	6	23.0	7.11	5.3	99.3				
		23.0	7.12	5.0	97.0				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	23.0	7.33	4.4					
		22.9	7.37	4.4					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.2	7.80	4.4					
		23.2	7.88	3.7					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.6	7.77	5.1	129.7				
		23.5	7.71	4.8	140.5				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.3	7.32	4.8					
		23.3	7.26	4.3					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.2	7.14	5.1					
		23.1	7.10	5.7					
30-Jul-11	18	23.7							
		23.7							
31-Jul-11	19	23.4							
		23.4							
1-Aug-11	20	23.7	7.17	4.9	94.9				
		23.7	7.18	5.5	89.5				
2-Aug-11	21	23.2							
		23.3							
3-Aug-11	22	22.6	7.11	4.9					
		22.6	7.12	5.1					
4-Aug-11	23	22.6							
		22.6							
5-Aug-11	24	22.7	7.09	5.5					
		22.7	6.99	5.3					
6-Aug-11	25	22.4							
		22.4							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.8	7.17	5.4	98.5				
		22.8	7.03	4.9	91.8				
9-Aug-11	28	22.5	7.07	4.9	99.0	32	52	0.00	U
		22.6	7.02	5.1	96.4				
Mean		**23.1**	**7.24**	**5.0**	**105**	**38**	**52**	**0.69**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.7**	**7.88**	**5.9**	**141**	**44**	**52**	**1.38**	
Min#		**22.4**	**6.99**	**3.7**	**90**	**32**	**52**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.6	6.98	6.1	106.8	40	56	1.21	
		23.6	7.01	5.9	106.1			1.12	
13-Jul-11	1	23.5	7.11	5.4					
		23.5	7.08	5.4					
14-Jul-11	2	23.2		5.0					
		23.2		5.3					
15-Jul-11	3	23.0	6.98	5.0					
		23.0	7.07	5.1					
16-Jul-11	4	23.5							
		23.5							
17-Jul-11	5	23.5							
		23.5							
18-Jul-11	6	23.0	7.15	5.6	97.7				
		23.0	7.13	5.8	97.5				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	23.0	7.28	4.0					
		23.0	7.30	4.0					
21-Jul-11	9	23.2		4.5					
		23.2		4.7					
22-Jul-11	10	23.2	7.86	4.1					
		23.2	7.82	4.0					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.3							
25-Jul-11	13	23.4	7.74	4.9	130.3				
		23.4	7.67	6.3	124.9				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.3	7.26	4.9					
		23.3	7.48	5.1					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.11	5.4					
		23.1	7.01	5.6					
30-Jul-11	18	23.8							
		23.7							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.7	7.20	5.9	94.2				
		23.7	7.22	6.2	97.5				
2-Aug-11	21	23.2							
		23.2							
3-Aug-11	22	22.6	7.14	5.3					
		22.6	7.14	5.7					
4-Aug-11	23	22.6							
		22.6							
5-Aug-11	24	22.7	7.10	5.7					
		22.7	7.06	5.6					
6-Aug-11	25	22.4							
		22.4							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.8	7.13	5.1	99.2				
		22.8	7.10	5.1	94.9				
9-Aug-11	28	22.6	7.10	5.2	97.9	36	44	0.00	U
		22.6	7.18	5.7	92.1				
Mean		**23.1**	**7.23**	**5.2**	**103**	**38**	**50**	**0.78**	
Number		**58**	**28**	**32**	**12**	**2**	**2**	**3**	
Max #		**23.8**	**7.86**	**6.3**	**130**	**40**	**56**	**1.21**	
Min#		**22.4**	**6.98**	**4.0**	**92**	**36**	**44**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.6	7.02	5.8	116.3	40	100	1.07	
		23.6	7.08	6.0	114.7				
13-Jul-11	1	23.5	7.11	5.8					
		23.5	7.14	5.7					
14-Jul-11	2	23.1		5.3					
		23.1		5.4					
15-Jul-11	3	23.0	7.01	5.0					
		23.0	7.10	4.7					
16-Jul-11	4	23.5							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.0	7.21	5.7	95.8				
		22.9	7.16	5.1	98.7				
19-Jul-11	7	22.8							
		22.7							
20-Jul-11	8	23.0	7.38	4.5					
		23.0	7.39	5.0					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.2	7.85	4.7					
		23.2	7.94	4.5					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.4	7.89	6.0	135.4				
		23.4	8.00	5.7	132.5				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.3	7.54	5.7					
		23.3	7.60	5.2					
28-Jul-11	16	23.1							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.2	7.14	6.5					
		23.1	7.19	6.3					
30-Jul-11	18	23.8							
		23.8							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.7	7.21	6.3	96.1				
		23.7	7.45	6.2	108.3				
2-Aug-11	21	23.3							
		23.3							
3-Aug-11	22	22.6	7.18	5.7					
		22.6	7.17	5.1					
4-Aug-11	23	22.6		4.9					
		22.6		5.4					
5-Aug-11	24	22.7	7.13	5.9					
		22.7	7.15	5.9					
6-Aug-11	25	22.4							
		22.5							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.8	7.17	5.7	97.2				
		22.8	7.18	5.6	97.7				
9-Aug-11	28	22.6	7.20	5.4	102.9	36	48	0.00	U
		22.6	7.22	6.2	99.5				
Mean		**23.1**	**7.31**	**5.5**	**108**	**38**	**74**	**0.54**	
Number		**58**	**28**	**32**	**12**	**2**	**2**	**2**	
Max #		**23.8**	**8.00**	**6.5**	**135**	**40**	**100**	**1.07**	
Min#		**22.4**	**7.01**	**4.5**	**96**	**36**	**48**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	7.26	6.3	118	40	48	0.86	
		23.5	7.23	6.2	116.3				
13-Jul-11	1	23.5	7.25	5.9					
		23.5	7.25	5.9					
14-Jul-11	2	23.1		5.4					
		23.1		5.8					
15-Jul-11	3	23.0	7.04	5.4					
		23.0	7.06	5.4					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	22.9	7.18	5.6	92.6				
		22.9	7.18	5.4	100.0				
19-Jul-11	7	22.7							
		22.8							
20-Jul-11	8	23.0	7.29	5.4					
		23.0	7.27	5.4					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.2	7.59	4.7					
		23.3	7.62	5.1					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.3							
		23.3							
25-Jul-11	13	23.6	7.89	6.6	123.7				
		23.6	7.87	7.0	130.6				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.3	7.65	5.6					
		23.3	7.72	6.1					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.32	5.3					
		23.0	7.33	5.8					
30-Jul-11	18	23.7							
		23.8							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.7	7.43	5.2	104.5				
		23.7	7.51	6.1	103.6				
2-Aug-11	21	23.2							
		23.3							
3-Aug-11	22	22.6	7.34	5.8					
		22.6	7.35	5.3					
4-Aug-11	23	22.6							
		22.6							
5-Aug-11	24	22.7	7.15	5.8					
		22.7	7.31	5.7					
6-Aug-11	25	22.5							
		22.5							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.8	7.35	5.7	103.1				
		22.8	7.37	5.7	105.3				
9-Aug-11	28	22.6	7.31	5.8	107.0	40	48	0.00	U
		22.6	7.43	5.4	115.9				
Mean		**23.1**	**7.38**	**5.7**	**110**	**40**	**48**	**0.43**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.8**	**7.89**	**7.0**	**131**	**40**	**48**	**0.86**	
Min#		**22.5**	**7.04**	**4.7**	**93**	**40**	**48**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	7.39	6.5	115.9	40	44	0.63	
		23.5	7.47	6.5	120.2				
13-Jul-11	1	23.5	7.39	6.4					
		23.5	7.41	6.5					
14-Jul-11	2	23.0		6.1					
		23.1		5.7					
15-Jul-11	3	23.0	7.09	5.6					
		23.0	7.16	5.2					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.0	7.27	6.2	99.2				
		23.0	7.30	6.0	99.2				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	23.0	7.24	5.7					
		23.0	7.28	5.5					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.3	7.31	5.7					
		23.3	7.34	5.7					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.3							
		23.3							
25-Jul-11	13	23.6	7.52	6.7	107.1				
		23.4	7.51	6.6	108.6				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.3	7.58	6.5					
		23.3	7.49	6.3					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.38	6.3					
		23.0	7.43	6.4					
30-Jul-11	18	23.8							
		23.8							
31-Jul-11	19	23.3							
		23.4							
1-Aug-11	20	23.7	7.62	6.2	108.1				
		23.7	7.61	6.2	110.7				
2-Aug-11	21	23.3							
		23.3							
3-Aug-11	22	22.6	7.46	5.7					
		22.6	7.53	6.1					
4-Aug-11	23	22.6							
		22.6							
5-Aug-11	24	22.7	7.37	5.7					
		22.7	7.40	6.0					
6-Aug-11	25	22.4							
		22.4							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.8	7.46	6.0	106.2				
		22.8	7.45	6.2	104.0				
9-Aug-11	28	22.5	7.55	6.1	116.3	38	52	0.00	U
		22.6	7.48	6.0	111.9				
Mean		**23.1**	**7.41**	**6.1**	**109**	**39**	**48**	**0.32**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.8**	**7.62**	**6.7**	**120**	**40**	**52**	**0.63**	
Min#		**22.4**	**7.09**	**5.2**	**99**	**38**	**44**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	7.69	6.7	118.0	40	52	0.35	
		23.5	7.68	6.7	116.0				
13-Jul-11	1	23.5	7.54	6.6					
		23.5	7.54	6.5					
14-Jul-11	2	23.1		5.9					
		23.1		6.2					
15-Jul-11	3	23.0	7.21	5.7					
		23.0	7.26	6.1					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.2							
		23.2							
18-Jul-11	6	22.9	7.39	6.4	100.4				
		22.9	7.36	6.2	100.1				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	22.8	7.37	6.0					
		22.8	7.32	5.5					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.3	7.38	5.5					
		23.3	7.46	6.2					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.3							
		23.2							
25-Jul-11	13	23.4	7.47	7.3	105.6				
		23.3	7.55	7.4	108.8				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.3	7.51	6.9					
		23.3	7.47	7.0					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.28	7.2					
		23.1	7.31	6.6					
30-Jul-11	18	23.8							
		23.7							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.7	7.34	6.2	97.9				
		23.7	7.44	6.5	99.4				
2-Aug-11	21	23.3							
		23.3							
3-Aug-11	22	22.6	7.51	6.8					
		22.6	7.45	6.6					
4-Aug-11	23	22.6							
		22.6							
5-Aug-11	24	22.7	7.30	6.7					
		22.7	7.38	6.9					
6-Aug-11	25	22.4							
		22.4							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.8	7.34	6.2	100.2				
		22.8	7.33	6.3	100.7				
9-Aug-11	28	22.6	7.29	5.9	104.3	36	56	0.00	U
		22.6	7.37	6.3	106.2				
Mean		**23.1**	**7.41**	**6.4**	**105**	**38**	**54**	**0.18**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.8**	**7.69**	**7.4**	**118**	**40**	**56**	**0.35**	
Min#		**22.4**	**7.21**	**5.5**	**98**	**36**	**52**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	6.81	4.6	107.5	36	40	2.48	
		23.5	6.80	4.7	104.1				
13-Jul-11	1	23.5	7.01	5.2					
		23.5	7.01	5.5					
14-Jul-11	2	23.2		4.9					
		23.2		4.9					
15-Jul-11	3	23.0	6.91	4.7					
		23.0	6.97	4.5					
16-Jul-11	4	23.3							
		23.2							
17-Jul-11	5	23.2							
		23.2							
18-Jul-11	6	22.9	7.09	5.5	94.0				
		23.0	7.01	5.1	94.7				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	22.8	7.24	4.0					
		22.8	7.23	4.6					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.3	7.82	4.2					
		23.3	7.61	4.0					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.1							
		23.1							
25-Jul-11	13	23.4	7.68	4.5	134.2				
		23.4	7.71	4.1	140.1				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.2	7.58	5.4					
		23.2	7.41	4.6					
28-Jul-11	16	23.0							
		23.0							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 10%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.02	4.2					
		23.1	7.31	6.0					
30-Jul-11	18	23.8							
		23.8							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.7	7.11	5.5	93.1				
		23.7	7.16	5.8	97.1				
2-Aug-11	21	23.3		4.7					
		23.3		5.0					
3-Aug-11	22	22.6	7.06	5.1					
		22.6	7.18	4.8					
4-Aug-11	23	22.6							
		22.6							
5-Aug-11	24	22.7	7.00	5.2					
		22.7	6.97	5.1					
6-Aug-11	25	22.6							
		22.6							
7-Aug-11	26	22.8							
		22.7							
8-Aug-11	27	22.9	6.92	4.5	96.9				
		22.8	7.16	4.7	105.7				
9-Aug-11	28	22.7	7.12	4.7	101.7	34	48	0.00	U
		22.7	6.98	4.6	92.1	34	48		
Mean		**23.1**	**7.17**	**4.8**	**105**	**35**	**45**	**1.24**	
Number		**58**	**28**	**32**	**12**	**3**	**3**	**2**	
Max #		**23.8**	**7.82**	**6.0**	**140**	**36**	**48**	**2.48**	
Min#		**22.6**	**6.80**	**4.0**	**92**	**34**	**40**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	6.79	4.8	101.8	34	32	2.82	
		23.5	6.79	4.5	105.5				
13-Jul-11	1	23.5	6.97	5.3					
		23.5	6.97	5.3					
14-Jul-11	2	23.1		4.9					
		23.2		5.0					
15-Jul-11	3	23.0	6.88	5.0					
		22.9	6.95	4.9					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.2							
		23.2							
18-Jul-11	6	22.9	7.02	4.8	96.9				
		22.9	6.97	5.1	96.3				
19-Jul-11	7	22.7							
		22.7							
20-Jul-11	8	22.8	7.40	5.2					
		22.8	7.28	4.3					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.3	7.61	4.2					
		23.2	7.48	3.7					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.41	4.4	122.6				
		23.4	7.37	4.6	126.3				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.2	7.41	4.9					
		23.2	7.36	5.9					
28-Jul-11	16	23.0							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 20%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.15	4.2					
		23.1	7.14	5.9					
30-Jul-11	18	23.8							
		23.8							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.8	6.98	4.7	95.3				
		23.7	7.07	5.9	89.5				
2-Aug-11	21	23.3							
		23.3							
3-Aug-11	22	22.6	7.11	4.8					
		22.6	7.30	6.3					
4-Aug-11	23	22.6							
		22.6							
5-Aug-11	24	22.7	6.96	5.0					
		22.7	7.08	6.0					
6-Aug-11	25	22.5							
		22.5							
7-Aug-11	26	22.8							
		22.8							
8-Aug-11	27	22.9	7.01	5.2	95.0				
		22.8	7.06	5.4	94.3				
9-Aug-11	28	22.6	7.03	4.4	101.3	36	48	0.00	U
		22.6	7.07	5.0	101.3				
Mean		**23.1**	**7.13**	**5.0**	**102**	**35**	**40**	**1.41**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.8**	**7.61**	**6.3**	**126**	**36**	**48**	**2.82**	
Min#		**22.5**	**6.79**	**3.7**	**90**	**34**	**32**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	6.88	5.2	101.6	32	36	2.83	
		23.5	6.80	5.3	99.4				
13-Jul-11	1	23.5	6.96	5.2					
		23.5	7.01	5.4					
14-Jul-11	2	23.2		5.1					
		23.2		5.6					
15-Jul-11	3	23.0	6.92	4.8					
		22.8	6.95	4.7					
16-Jul-11	4	23.2							
		23.2							
17-Jul-11	5	23.2							
		23.3							
18-Jul-11	6	22.9	7.01	4.9	92.9				
		22.9	7.02	5.1	96.0				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	22.7	7.26	4.5					
		22.8	7.23	4.5					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.3	7.72	4.5					
		23.3	7.68	4.3					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.77	5.0	131.1				
		23.5	7.80	5.1	117.6				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.2	7.66	5.0					
		23.2	7.62	5.6					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 40%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.30	5.4					
		23.1	7.42	5.3					
30-Jul-11	18	23.8							
		23.8							
31-Jul-11	19	23.3							
		23.4							
1-Aug-11	20	23.7	7.14	5.8	100.2				
		23.8	7.22	6.0	99.2				
2-Aug-11	21	23.3							
		23.3							
3-Aug-11	22	22.5	7.31	5.9					
		22.5	7.31	5.8					
4-Aug-11	23	22.6							
		22.7							
5-Aug-11	24	22.8	7.10	5.5					
		22.8	7.05	5.4					
6-Aug-11	25	22.5							
		22.4							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.8	7.17	5.1	103.0				
		22.8	7.15	5.3	98.9				
9-Aug-11	28	22.6	7.00	5.0	93.8	36	48	0.00	U
		22.6	7.13	5.3	103.1				
Mean		**23.1**	**7.24**	**5.2**	**103**	**34**	**42**	**1.42**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.8**	**7.80**	**6.0**	**131**	**36**	**48**	**2.83**	
Min#		**22.4**	**6.80**	**4.3**	**93**	**32**	**36**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	6.95	5.4	101.9	36	40	2.47	
		23.5	6.99	5.7	100.0				
13-Jul-11	1	23.5	6.99	5.4					
		23.6	7.00	5.4					
14-Jul-11	2	23.2		5.3					
		23.2		5.4					
15-Jul-11	3	23.0	6.97	4.8					
		23.0	6.95	5.2					
16-Jul-11	4	23.3							
		23.2							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.0	7.03	5.4	92.6				
		23.0	7.06	5.3	93.5				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	22.7	7.27	4.2					
		22.7	7.28	5.1					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.3	7.80	5.1					
		23.2	7.80	4.7					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	8.04	5.2	133.7				
		23.5	7.99	5.0	134.1				
26-Jul-11	14	23.0							
		23.0							
27-Jul-01	15	23.2	7.82	5.5					
		23.2	7.80	5.2					
28-Jul-11	16	23.1							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 60%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.2	7.22	5.3					
		23.1	7.44	5.7					
30-Jul-11	18	23.9							
		23.9							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.8	7.11	5.6	96.0				
		23.8	7.34	5.8	115.2				
2-Aug-11	21	23.2							
		23.3							
3-Aug-11	22	22.5	7.28	5.5					
		22.4	7.38	6.4					
4-Aug-11	23	22.7							
		22.7							
5-Aug-11	24	22.7	7.18	5.9					
		22.7	7.22	5.8					
6-Aug-11	25	22.5							
		22.6							
7-Aug-11	26	22.7							
		22.7							
8-Aug-11	27	22.9	7.15	5.4	97.1				
		22.8	7.15	5.6	99.9				
9-Aug-11	28	22.6	7.17	5.2	101.5	36	60	0.00	U
		22.6	7.20	5.7	99.4	36	52		
Mean		**23.1**	**7.31**	**5.4**	**105**	**36**	**51**	**1.24**	
Number		**58**	**28**	**30**	**12**	**3**	**3**	**2**	
Max #		**23.9**	**8.04**	**6.4**	**134**	**36**	**60**	**2.47**	
Min#		**22.4**	**6.95**	**4.2**	**93**	**36**	**40**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	7.03	5.6	100.8	32	40	2.08	
		23.5	7.04	5.8	102.1				
13-Jul-11	1	23.6	7.02	5.3					
		23.6	6.97	5.4					
14-Jul-11	2	23.2		5.2					
		23.2		5.2					
15-Jul-11	3	23.0	6.95	5.5					
		23.0	6.99	5.1					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.0	6.92	4.9	93.8				
		23.0	6.94	5.0	90.1				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	22.7	7.11	4.7					
		22.6	7.19	5.1					
21-Jul-11	9	23.2							
		23.1							
22-Jul-11	10	23.2	7.45	4.3					
		23.2	7.59	4.1					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	8.06	4.8	133.4				
		23.5	8.01	5.1	131.0				
26-Jul-11	14	23.0							
		23.1							
27-Jul-01	15	23.2	7.98	5.3					
		23.2	7.65	5.1					
28-Jul-11	16	23.2							
		23.2							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 80%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.38	5.0					
		23.1	7.72	6.3					
30-Jul-11	18	23.9							
		23.9							
31-Jul-11	19	23.3							
		23.3							
1-Aug-11	20	23.7	7.23	5.5	101.7				
		23.8	7.29	5.2	104.2				
2-Aug-11	21	23.2							
		23.2							
3-Aug-11	22	22.4	7.28	5.6					
		22.5	7.22	5.8					
4-Aug-11	23	22.7							
		22.7							
5-Aug-11	24	22.7	7.18	5.9					
		22.7	7.17	5.6					
6-Aug-11	25	22.5							
		22.4							
7-Aug-11	26	22.8							
		22.7							
8-Aug-11	27	22.8	7.12	5.8	102.0				
		22.8	7.22	5.7	96.4				
9-Aug-11	28	22.6	7.27	5.7	107.4	36	52	0.00	U
		22.6	7.21	5.4	103.3				
Mean		**23.1**	**7.29**	**5.3**	**106**	**34**	**46**	**1.04**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.9**	**8.06**	**6.3**	**133**	**36**	**52**	**2.08**	
Min#		**22.4**	**6.92**	**4.1**	**90**	**32**	**40**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
12-Jul-11	0	23.5	7.06	5.7	102.9	32	40	1.99	
		23.5	7.07	5.7	103.1				
13-Jul-11	1	23.5	6.99	5.6					
		23.5	7.01	5.7					
14-Jul-11	2	23.1		4.9					
		23.2		5.1					
15-Jul-11	3	23.0	6.97	4.9					
		23.0	6.96	4.2					
16-Jul-11	4	23.3							
		23.3							
17-Jul-11	5	23.3							
		23.3							
18-Jul-11	6	23.0	6.98	5.4	90.4				
		23.0	6.98	5.2	90.2				
19-Jul-11	7	22.8							
		22.8							
20-Jul-11	8	22.8	7.01	4.6					
		22.8	7.01	5.1					
21-Jul-11	9	23.2							
		23.2							
22-Jul-11	10	23.2	7.33	4.5					
		23.2	7.30	4.5					
23-Jul-11	11	23.2							
		23.2							
24-Jul-11	12	23.2							
		23.2							
25-Jul-11	13	23.5	7.83	5.0	117.6				
		23.5	7.91	4.7	120.1				
26-Jul-11	14	23.1							
		23.1							
27-Jul-01	15	23.1	7.74	5.7					
		23.1	7.80	5.5					
28-Jul-11	16	23.2							
		23.1							

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 5.5 (GLC No. 8989) Concentration: 100%

Test Dates: July 12-August 9, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Date	Test Day	Temperature (°C)	pH (s.u.)	D.O. (mg/L)	Conductivity (mmos)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)	Ammonia Result Code
29-Jul-11	17	23.1	7.71	4.9					
		23.1	7.72	5.5					
30-Jul-11	18	23.9							
		23.9							
31-Jul-11	19	23.3							
		23.4							
1-Aug-11	20	23.8	7.45	5.2	118.9				
		23.8	7.54	5.4	115.3				
2-Aug-11	21	23.3							
		23.2							
3-Aug-11	22	22.5	7.36	5.5					
		22.5	7.51	5.7					
4-Aug-11	23	22.7							
		22.7							
5-Aug-11	24	22.7	7.23	5.8					
		22.7	7.26	5.5					
6-Aug-11	25	22.5							
		22.5							
7-Aug-11	26	22.7							
		22.8							
8-Aug-11	27	22.8	7.20	5.8	99.7				
		22.8	7.26	5.6	103.8				
9-Aug-11	28	22.6	7.27	5.6	108.7	34	56	0.00	U
		22.7	7.25	5.7	106.5				
Mean		**23.1**	**7.31**	**5.3**	**106**	**33**	**48**	**1.00**	
Number		**58**	**28**	**30**	**12**	**2**	**2**	**2**	
Max #		**23.9**	**7.91**	**5.8**	**120**	**34**	**56**	**1.99**	
Min#		**22.5**	**6.96**	**4.2**	**90**	**32**	**40**	**0.00**	

Ammonia Key:
MDL = 0.04
RL = Reporting Limit (lowest standard, 0.1)
J = Between MDL and RL
U = Below MDL (non detect)

Appendix C 3
Overlying Water Quality Summaries

- Emory River Water

Project Name: Tennessee Valley Authority
Project Number: 5069-03
Sample ID: Emory River Water (ERM 9.0)-Overlying water

Test Dates: July 7-September 14, 2011
Test Type: 28 Day Whole Sediment Toxicity Survival and Growth emergence
Test Species: *Chironomus dilutus and Hyalella azteca*
Data recorded in log book.

100% QC- AS

Chemisty Data for Emory River Water

Water ID	Date	Time	Temperature (°C)	D.O (s.u.)	pH (mg/L)	Spc (mmos)	Hardness (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Batch - GLC Number
Site	7/11/2011	16:30		8.9	7.02	81.4	164	26		9002
Site	7/11/2011	20:00	23.5	8.1	7.19					9002
Site	7/12/2011	7:45	23.1	8.4	7.47	82.0			0.02	9002
Site	7/12/2011		23.3	8.4						9002
Site	7/13/2011	7:30	23.5	8.3	7.57	81.5				9002
Site	7/13/2011	18:30	23.6	8.4						9002
Site	7/14/2011	6:15	23.1	8.6	7.64	84.4				9002
Site	7/14/2011	17:45	23.7	8.5						9002
Site	7/14/2011	17:45	22.7	9.0						9002
Site	7/15/2011	7:15	23.3	7.6	7.83	83.6				9002
Site	7/15/2011	7:15	23.0	7.6	7.94	88.1				9002
Site	7/15/2011	18:30	23.1	8.3						9002
Site	7/15/2011	18:30	22.6	8.8						9002
Site	7/16/2011	7:15	23.2	8.2	7.74	87.0				9002
Site	7/16/2011	7:15	23.3	8.2	7.73	85.6				9002
Site	7/16/2011	19:00	23.2	8.2						9002
Site	7/16/2011	19:00	22.3	8.9						9002
Site	7/17/2011	7:15	23.1	8.4	7.60	83.6				9002
Site	7/17/2011	7:15	23.3	8.3	7.57	85.2				9002
Site	7/17/2011	18:25	23.2	8.3						9002
Site	7/17/2011	18:25	23.2	8.6						9002
Site	7/18/2011	7:20	23.0	8.4	7.71	86.1				9002
Site	7/18/2011	7:20	23.3	8.5	7.75	83.3				9002
Site	7/18/2011	18:30	22.2	8.6						9002
Site	7/19/2011	7:10	23.3	8.4	7.36	82.7				9002
Site	7/19/2011			8.3	7.34	89.1	32	28	0.43	9002
Site	7/19/2011			8.4	7.18	93.9	36	32	0.01	9009
Site	7/19/2011		23.0	8.2						9009
Site	7/20/2011	6:45	23.1	7.6	7.20	94.7				9009
Site	7/20/2011	6:45	23.0	8.1	7.74	95.6				9009
Site	7/20/2011	19:15	23.4	8.4						9009
Site	7/20/2011	19:15	23.5	8.3						9009
Site	7/21/2011	6:45	23.0	8.4	7.89	98.3				9009
Site	7/21/2011	6:45	23.0	8.3	7.87	95.7				9009
Site	7/21/2011	18:45	23.5	8.4						9009
Site	7/21/2011	18:45	23.1	8.3						9009
Site	7/22/2011	7:15	22.8	8.5	7.88	97.9				9009
Site	7/22/2011	7:15	22.8	8.5	7.92	97.3				9009
Site	7/22/2011		23.0	8.3						9009
Site	7/22/2011		22.3	8.5						9009
Site	7/23/2011	7:10	22.7	8.6	7.74	94.8				9009
Site	7/23/2011	7:10	23.0	8.5	7.76	94.6				9009
Site	7/23/2011	18:15	23.0	8.5						9009
Site	7/23/2011	18:15	23.1	8.5						9009
Site	7/24/2011	7:10	23.2	8.5	7.72	95.4				9009
Site	7/24/2011	7:10	23.3	8.4	7.70	95.3				9009
Site	7/24/2011	18:15	22.8	8.4						9009
Site	7/24/2011	18:15	23.0	8.2						9009
Site	7/25/2011	7:55	23.1	8.6	7.73	94.2				9009
Site	7/25/2011	7:55	22.9	8.4	7.78	97.3				9009
Site	7/25/2011	14:10	23.9	8.4						9009
Site	7/25/2011	20:50	23.6	8.5						9009
Site	7/25/2011	20:50	23.6	8.4						9009
Site	7/26/2011	6:57	22.9	8.5	7.80	101.9				9009
Site	7/26/2011	6:57	23.0	8.4	7.60	100.8				9009
Site	7/26/2011	12:40	23.1	8.4	7.04	102.0		26		9009
Site	7/26/2011		23.1	8.3	7.07	100.1	44	26	0.00	9009
Site	7/26/2011		23.1	9.0	7.14	74.0	28	14	0.01	9016

Project Name: Tennessee Valley Authority
Project Number: 5069-03
Sample ID: Emory River Water (ERM 9.0)-Overlying water

Test Dates: July 7-September 14, 2011
Test Type: 28 Day Whole Sediment Toxicity Survival and Growth emergence
Test Species: *Chironomus dilutus and Hyalella azteca*
Data recorded in log book.

100% QC- AS

Chemisty Data for Emory River Water

Water ID	Date	Time	Temperature (°C)	D.O (s.u.)	pH (mg/L)	Spc (mmos)	Hardness (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Batch - GLC Number
Site	7/26/2011	17:40	23.8	8.3				18		9016
Site	7/26/2011	17:40	23.3	8.5						9016
Site	7/26/2011	23:36	23.1	8.5						9016
Site	7/27/2011	6:55	23.0	8.2	7.40	76.2				9016
Site	7/27/2011	6:55	23.1	8.3	7.60	74.6				9016
Site	7/27/2011	19:00	23.0	8.1	7.38					9016
Site	7/27/2011	19:00	24.0	7.9	7.30					9016
Site	7/27/2011	23:49	23.8	7.9						9016
Site	7/28/2011	6:30	22.8	7.9	7.71	75.8				9016
Site	7/28/2011	6:30	22.7	8.1	7.67	77.3				9016
Site	7/28/2011	12:00	23.2	7.3	7.36					9016
Site	7/28/2011	18:30	23.0	8.3						9016
Site	7/28/2011	18:30	23.4	8.4						9016
Site	7/28/2011	0:00	22.6	8.4						9023
Site	7/29/2011	6:05	22.6	8.4	7.33	78.2				9023
Site	7/29/2011	6:05	23.3	8.4	7.64	78.3				9016
Site	7/29/2011			8.3	7.26	77.2	28	22	0.09	9016
Site	7/29/2011			8.4	7.12	77.4	28	24	0.01	9023
Site	7/29/2011			5.8	6.99	89.2	36	30	0.00	9031
Site	7/29/2011	12:35	22.9	9.0	7.23	75.5				9023
Site	7/29/2011	18:00	23.2	8.4						9016
Site	7/29/2011	18:00	22.7	8.5						9023
Site	7/29/2011	23:00	23.0	8.5						9023
Site	7/30/2011	7:00	23.1	8.3						9023
Site	7/30/2011	7:00	23.5	8.1						9031
Site	7/30/2011	12:10	23.2	8.3						9023
Site	7/30/2011	12:10	22.8	8.2						9031
Site	7/30/2011		22.9	8.5						9023
Site	7/30/2011		23.0	8.4						9031
Site	7/30/2011	0:10	23.2	9.5						9031
Site	7/31/2011	6:00	23.4	8.4						9023
Site	7/31/2011	6:00	23.2	8.4						9031
Site	7/31/2011	14:00	23.2	8.6						9023
Site	7/31/2011	14:00	23.3	8.6						9031
Site	7/31/2011	18:10	23.0	8.5						9031
Site	7/31/2011	21:30	23.2	8.5	7.74	76.4	32	24	0.00	9023
Site	7/31/2011	21:30	22.9	8.5						9031
Site	8/1/2011		23.3	8.1	7.70	77.4				9023
Site	8/1/2011		23.1	8.3	7.81	91.5				9031
Site	8/1/2011	14:00	23.0	7.9						9023
Site	8/1/2011	21:00	23.6	8.3						9031
Site	8/1/2011	21:00	22.5	7.9						9031
Site	8/2/2011	7:00	23.1	8.2	7.81	90.3				9031
Site	8/2/2011	7:00	23.2	8.1	7.76	88.3				9031
Site	8/2/2011	12:00	23.2	7.9						9031
Site	8/2/2011	18:00	23.6	8.0						9031
Site	8/2/2011	18:00	23.2	8.2						9031
Site	8/2/2011	23:05	22.7	8.1						9031
Site	8/3/2011	6:00	22.7	8.2	7.72	86.6				9031
Site	8/3/2011	6:00	22.6	8.2	7.78	88.8				9031
Site	8/3/2011	12:15	23.1	8.5						9031
Site	8/3/2011	18:30	22.7	8.5						9031
Site	8/3/2011	18:30	22.5	8.5						9031
Site	8/3/2011	23:15	22.6	8.5						9031
Site	8/4/2011	6:45	22.3	7.5	7.88	88.2				9031
Site	8/4/2011	6:45	22.4	8.1	8.15	87.0				9031
Site	8/4/2011	12:16	22.5	8.1						9031
Site	8/4/2011	18:00	22.6	8.2						9031
Site	8/4/2011	18:00	22.8	8.2						9031

Project Name: Tennessee Valley Authority
Project Number: 5069-03
Sample ID: Emory River Water (ERM 9.0)-Overlying water

Test Dates: July 7-September 14, 2011
Test Type: 28 Day Whole Sediment Toxicity Survival and Growth emergence
Test Species: *Chironomus dilutus and Hyalella azteca*
Data recorded in log book.

100% QC- AS

Chemisty Data for Emory River Water

Water ID	Date	Time	Temperature (°C)	D.O (s.u.)	pH (mg/L)	Spc (mmos)	Hardness (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Batch - GLC Number
Site	8/4/2011	23:49	22.5	8.5					0.03	9031
Site	8/5/2011	6:30	23.0	8.5	8.05	89.1	40	36		9031
Site	8/5/2011	6:30	22.2	8.5	7.82	88.8				9031
Site	8/5/2011	11:37	23.1	8.6						9031
Site	8/5/2011	18:20	22.7	8.4			40	36	0.15	9032
Site	8/5/2011	18:20	22.9	8.4						9032
Site	8/5/2011		23.1	8.2						9032
Site	8/6/2011	8:11	22.7	8.2	7.62	95.9				9032
Site	8/6/2011	8:11	22.2	8.3	7.62	99.9				9032
Site	8/6/2011	11:45	22.3	8.0	7.80					9032
Site	8/6/2011	17:15	22.6	8.4						9032
Site	8/6/2011	11:15	23.0	8.4						9032
Site	8/6/2011	23:54	23.0	8.3						9032
Site	8/7/2011	6:30	22.8	8.4	7.62	96.1				9032
Site	8/7/2011	6:30	22.4	8.3	7.64	97.2				9032
Site	8/7/2011	11:50	22.4	8.3	7.49					9032
Site	8/7/2011		22.7	8.2						9032
Site	8/7/2011		22.9	8.2						9032
Site	8/7/2011	23:25	24.2	7.9						9032
Site	8/8/2011	7:25	23.0	8.1	7.48	96.2				9032
Site	8/8/2011	8:00	23.1	8.3	7.72	94.5				9032
Site	8/8/2011	11:35	22.8	8.0						9032
Site	8/8/2011	17:16	22.4	8.1						9032
Site	8/8/2011	17:16	22.3	8.1						9032
Site	8/8/2011	22:38	23.0	8.2						9032
Site	8/9/2011		22.4	8.0	7.06	97.0				9032
Site	8/9/2011		22.6	7.5	7.24	95.0				9032
Site	8/9/2011		22.3	8.2						9032
Site	8/9/2011	17:20	22.5	8.2						9032
Site	8/9/2011	23:15	22.3	8.2						9032
Site	8/10/2011		22.2	8.4	7.52	98.6				9032
Site	8/10/2011	11:45	22.9	8.4						9032
Site	8/10/2011	19:00	22.3	7.9						9032
Site	8/10/2011	22:50	22.9	8.1						9032
Site	8/11/2011	6:15	22.3	8.1	7.96	97.5				9032
Site	8/11/2011	11:15	22.6	8.2						9032
Site	8/11/2011	18:00	22.7	8.2						9032
Site	8/11/2011	22:45	22.8	8.2						9032
Site	8/12/2011	7:00	22.8	8.4	7.81					9032
Site	8/12/2011	12:00	22.8	8.5						9032
Site	8/12/2011	17:00	22.3	8.2						9032
Site	8/12/2011	23:45	22.7	8.4						9032
Site	8/13/2011	6:42	22.7	8.4	7.62	96.4				9032
Site	8/13/2011	10:50	22.8	8.2						9032
Site	8/13/2011	17:45	22.9	8.4						9032
Site	8/13/2011	23:10	22.8	8.4						9032
Site	8/14/2011	6:34	22.8	8.3	7.91	97.7				9032
Site	8/14/2011	11:40	22.8	8.4						9032
Site	8/14/2011	17:01	23.1	8.3						9032
Site	8/14/2011	22:53	22.8	8.3						9032
Site	8/15/2011	6:07	23.1	8.2	7.79	96.1				9032
Site	8/15/2011	12:23	22.7	8.1						9032
Site	8/15/2011	16:19	23.5	7.7			40	34	0.74	9032
Site	8/15/2011	22:58	23.5	7.8			72	64	0.23	9037
Site	8/16/2011	6:29	22.6	8.4	7.96	152.3				9037
Site	8/16/2011	12:08	22.5	8.4						9037
Site	8/16/2011	17:50	23.7	7.3						9037
Site	8/16/2011	23:00	23.7							9037
Site	8/17/2011	6:12	23.0	8.1	7.64	151.7				9037

Project Name: Tennessee Valley Authority
Project Number: 5069-03
Sample ID: Emory River Water (ERM 9.0)-Overlying water

Test Dates: July 7-September 14, 2011
Test Type: 28 Day Whole Sediment Toxicity Survival and Growth emergence
Test Species: *Chironomus dilutus and Hyalella azteca*
Data recorded in log book.

100% QC- AS

Chemisty Data for Emory River Water

Water ID	Date	Time	Temperature (°C)	D.O (s.u.)	pH (mg/L)	Spc (mmos)	Hardness (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Batch - GLC Number
Site	8/17/2011	12:10	23.8	7.8						9037
Site	8/17/2011	20:43	22.7	8.5						9037
Site	8/18/2011	6:54	22.7	8.5	8.04	150.3				9037
Site	8/18/2011	14:31	22.5	7.9	7.34	149.0				9037
Site	8/18/2011	22:20	22.8	8.4						9037
Site	8/19/2011	6:13	22.5	8.4	7.86	147.5				9037
Site	8/19/2011	14:00	22.8	8.3						9037
Site	8/19/2011	18:35	23.0	8.2						9037
Site	8/19/2011	0:00	23.1	8.5						9037
Site	8/20/2011	7:00	23.1	8.4	7.90	149.1				9037
Site	8/20/2011	13:05	22.9	8.4						9037
Site	8/20/2011	21:15	22.8	8.3						9037
Site	8/21/2011	7:00	23.1	8.4	7.89	147.7				9037
Site	8/21/2011	17:30	22.9	8.5						9037
Site	8/22/2011	6:45	22.7	8.3	8.07	144.9				9037
Site	8/22/2011	15:21	23.0	8.4	7.22	147.9	76	60	0.14	9037
Site	8/22/2011	15:21	23.5	8.0	7.57	265.3	140	102	0.09	9049
Site	8/22/2011	17:05	22.9	9.0						9049
Site	8/23/2011	7:15	23.2	8.5	8.23	260.6				9049
Site	8/23/2011	17:55	23.1	8.4						9049
Site	8/24/2011	6:45	23.7	8.2	8.29	258.0				9049
Site	8/24/2011	17:15	23.3	8.3						9049
Site	8/25/2011	6:20	22.8	8.3	8.15	260.3				9049
Site	8/25/2011	17:30	22.6	8.3						9049
Site	8/26/2011	6:20	22.2	8.3	7.75	261.7				9049
Site	8/26/2011		22.7	8.4						9049
Site	8/27/2011	6:40	22.7	8.2	8.25	259.6				9049
Site	8/27/2011	17:40	23.0	8.4	7.67					9049
Site	8/28/2011	6:25	23.0	8.4	8.18	259.8				9049
Site	8/28/2011	13:00	22.8	8.3						9049
Site	8/28/2011	22:49	23.0	8.2						9049
Site	8/29/2011	6:30	22.8	8.1	8.23	262.0				9049
Site	8/29/2011	13:57	23.2	8.5						9049
Site	8/29/2011	22:10	23.0	8.4						9049
Site	8/30/2011	6:24	23.0	8.4	8.23	260.4				9049
Site	8/30/2011	13:27	22.7	8.3						9049
Site	8/30/2011	17:14	23.3	8.4						9049
Site	8/30/2011	23:32	22.7	8.3						9049
Site	8/31/2011	6:27	22.8	8.4	8.34	258.8	116	102	0.13	9049
Site	8/31/2011	12:37	23.1	8.3	7.46	261.3	124	102	0.15	9059
Site	8/31/2011	18:30	22.3	8.1						9059
Site	8/31/2011	23:55	23.0	8.3						9059
Site	9/1/2011	6:50	23.7	8.5	8.33	259.0				9059
Site	9/1/2011	11:50	22.7	8.8						9059
Site	9/1/2011	17:00	23.3	8.7						9059
Site	9/1/2011	23:55	22.8	8.3						9059
Site	9/2/2011	6:25	23.2	8.4	7.96	261.3				9059
Site	9/2/2011	14:00	22.8	8.4						9059
Site	9/2/2011	22:04	22.7	8.5						9059
Site	9/3/2011	6:00	22.6	8.3	7.89	259.2				9059
Site	9/3/2011	17:30	23.2	8.4						9059
Site	9/4/2011	5:20	22.8	8.4						9059
Site	9/4/2011	17:14	22.3	8.3						9059
Site	9/5/2011	6:00	22.8	8.4	7.84	254.1				9059
Site	9/5/2011		22.9	8.6	8.27	261.9				9059
Site	9/6/2011	6:04	22.5	8.0	8.19	261.3				9059
Site	9/6/2011	17:15	22.9	8.1						9059
Site	9/7/2011	6:48	22.6	8.4	8.24	257.9				9059
Site	9/7/2011		22.3	8.4	8.16	262.5	124	102	0.05	9059

Project Name: Tennessee Valley Authority
Project Number: 5069-03
Sample ID: Emory River Water (ERM 9.0)-Overlying water

Test Dates: July 7-September 14, 2011
Test Type: 28 Day Whole Sediment Toxicity Survival and Growth emergence
Test Species: *Chironomus dilutus and Hyalella azteca*
Data recorded in log book.

100% QC- AS

Chemisty Data for Emory River Water

Water ID	Date	Time	Temperature (°C)	D.O (s.u.)	pH (mg/L)	Spc (mmos)	Hardness (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Batch - GLC Number
Site	9/7/2011		24.6	8.4	8.16	263.7	124	104	0.01	9062
Site	9/7/2011	17:00	23.2	7.6						9062
Site	9/8/2011	6:25	22.7	8.6	8.21	255.2				9062
Site	9/9/2011	7:00	22.7	8.1	8.35	258.0				9062
Site	9/9/2011	17:00	22.8	8.4						9062
Site	9/10/2011	7:00	22.9	8.3	8.21	256.0				9062
Site	9/10/2011	18:00	22.6	8.4						9062
Site	9/11/2011	7:00	22.7	8.4	8.33	255.0				9062
Site	9/11/2011	18:20	23.5	8.4						9062
Site	9/12/2011	6:49	23.2	8.5	8.27	257.5				9062
Site	9/12/2011	17:00	23.4	8.4						9062
Site	9/13/2011	6:49	23.1	8.3	8.26	258.8				9062
Site	9/13/2011	16:50	22.2	8.4						9062
Site	9/14/2011		21.7	7.4	8.16	264.6	132	106	0.11	9062
Average:			22.9	8.3	7.74	140	73	51	0.12	

Number	244	248	110	102	20	22	21
Max #	24.6	9.5	8.35	265.3	140.0	106.0	0.7
Min#	21.7	5.8	6.99	74.0	28.0	14.0	0.0

Appendix D
Chironomus dilutus
20-Day Statistical Data

- Survival
- Weight

GLEC

TVA: 5069-03

Emory River

Sample ID: GLW

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: Nw

GLC#: NA	Test Photoperiod: 16:8
Sample ID: GLW(Glec Laboratory Water only)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 4

X DS 6:55 Renewal time/initials X 1200 MLL Renewal time/initials

X 1830 MLL Renewal time/initials X 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

X DS 6:40 chemistries time/Initial MLL 1145

Not fed due to low DO <2.5 SAM

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	6	
1	22.0	2.7	AV
2	22.0	3.0	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 4

X 0830 AM Renewal time/initials X 1220 KN Renewal time/initials

X 1845 MLL Renewal time/initials X 2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ ml/replicate 1.0 SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

X DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				AV
2				
3				
4				
5				
6				
7				
8				
9				
10	22.6	7.86	6.6	
11				
12	22.6	7.78	6.2	

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: GLW

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: NA	Test Photoperiod: 16:8
Sample ID: GLW(Glec Laboratory Water only)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 – 20 day endpoint	✗ 0700 AN renewal time/Initials ✗ 1815 MW renewal time/Initials
Overlying Water: Dechlor (Glec Laboratory Water)	✗ 12:32 DS renewal time/Initials ✗ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): NA	Food: (Tetrafin 4g/L) TFS# 003 ✗ Feed ~~1.5~~ ml/replicate MW 1.0 ml due to DO < 3.0 mg/L
✗ DS 6:00 chemistries time/Initial	Screens Cleaned: ✗ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MW / MLL
1								
2					136	106	0.15	AV BHV
3	22.3	7.72	6.0	305				
4	22.3	7.76	6.1	303	End mL: 46.0	End mL: 19.0		✗ rep 4 - 12 larvae
5					Start mL: 42.6	Start mL: 13.7		AV BHV
6					mL used: 3.4	mL used: 5.3		✗ rep 6 - 9 larvae
7								AV BHV
8								
9								✗ rep 9 - 12 larvae
10								AV BHV
11								✗ rep 11 - 12 larvae
12								MW 8/4/11 AV BHV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

✗ 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: LCS+GLW

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: NA	Test Photoperiod: 16:8
Sample ID: LCS+GLW(Laboratory Control Sediment + Glec Laboratory Water)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 4

~~DS~~ 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low DO < 2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	6	
1	22.0	1.6	NAV BHV
2	22.1	1.5	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 4

~~X~~0630 AM Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0612 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

~~X~~DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				BHV
2				
3				
4				
5				
6				
7				
8				
9				
10	22.6	7.54	3.5	
11				
12	22.5	7.50	1.9	

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

Sample ID: LCS+GLW

Concentration: NA

TVA: 5069-03

Emory River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: NA	Test Photoperiod: 16:8
Sample ID: LCS+GLW(Laboratory Control Sediment + Glec Laboratory Water)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	✗ 0700 AD renewal time/Initials ✗ 1845 [illegible] renewal time/Initials
Overlying Water: Dechlor (Glec Laboratory Water)	✗ 12:32 DS renewal time/Initials ✗ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): NA	Food: (Tetrafin 4g/L) TFS# 062 ✗ Feed 15 ml/replicate [illegible] 10ml due to DO <3.0 mg/L
✗ DS 6:00 chemistries time/Initial	Screens Cleaned: ✗ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: [illegible] /MLL
1								BHV
2					136	112	0.12	↓
3	22.3	7.44	3.0	300				*Rep 3 – 12 larvae
4	22.4	7.46	2.7	308	End mL: 49.4	End mL: 24.6		BHV
5					Start mL: 46.0	Start mL: 19.0		↓
6					mL used: 3.4	mL used: 5.6		*Rep 6 – 11 larvae
7								BHV
8								↓
9								↓
10								*Rep 10 – 11 larvae
11								*Rep 11 – 13 larvae
12								BHV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

✗ 20-day endpoint

Relative % Difference: RPD ≤15%

$$RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$$

Ammonia Reporting Limits:

RL = Reporting Limit (0.10 mg/L).
MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10.
J = ≥ MDL and < RL.
U = Below MDL.

Observation Key:

AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: LCS+ERW

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: NA	Test Photoperiod: 16:8
Sample ID: LCS+ERW(Laboratory Control Sediment + Emory River Water)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS~~ 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# —— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.7	2.0	BHV
2	23.6	2.5	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0830 MD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2350 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

~~X~~DS 6:31 chemistries time/Initial

Replicate	Temperature (23± 1°C)* MD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV
2				BHV
3				
4				
5	22.8	7.22	2.5	
6				
7				
8	22.8	7.15	1.9	
9				
10				
11				
12				

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

Sample ID: LCS+ERW

Concentration: NA

TVA: 5069-03

Emory River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: NA	Test Photoperiod: 16:8
Sample ID: LCS+ERW(Laboratory Control Sediment + Emory River Water)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	✗ 0700 AD renewal time/Initials ✗ 1815 MW renewal time/Initials
Overlying Water: Emory River Water	✗ 1213 DS renewal time/Initials ✗ 2400 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 7031	Food: (Tetrafin 4g/L) TFS# 062 ✗ Feed ~~1.5~~ 1.0 ml/replicate MW 1.0 ml due to DO<3.0 mg/L
✗ DS 6:40 chemistries time/Initial	Screens Cleaned: ✗ yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MW /MLL
1								* rep 1 - 12 larvae
2					52	46	0.37	* rep 2 - 11 larvae
3	22.8	7.09	2.7	112.0				BHV
4	22.7	7.14	2.5	117.4	End mL: 28.9	End mL: 36.4		* rep 4 - 12 larvae
5					Start mL: 27.6	Start mL: 34.1	DUP	BHV
6					mL used: 1.3	mL used: 2.3	0.23	
7								
8					DUP	DUP		
9					End: 17.0	End:		FOV-snail (removed)
10					Start: 15.6	Start: 9.5		* rep 10 - 11 larvae
11					mL used:	mL used: 11.5		BHV
12					56 1.4	40 2.0		

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM Reference

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: nw

GLC#: 8981	Test Photoperiod: 16:8
Sample ID: ERM Reference	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

DS 6:55 Renewal time/initials 1200 MLL Renewal time/initials

1830 MLL Renewal time/initials 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.2	2.7	NAV
2	23.2	3.0	↓
3			BHV
4			AV
5			NAV
6			BHV
7			↓
8			AV
9			NAV
10			BHV
11			NAV
12			BHV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

0630 HD Renewal time/initials 1220 KN Renewal time/initials

1845 MLL Renewal time/initials 2350 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0612 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

DS 6:31 chemistries time/Initial

Replicate	Temperature (23± 1°C)* HD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV
2				↓
3				BHV
4				↓
5	22.7	7.03	3.6	↓
6				
7				BHV
8	22.8	7.06	3.5	↓
9				↓
10				AV-pupae
11				NAV
12				↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM Reference

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: nw

GLC#: 8981	Test Photoperiod: 16:8
Sample ID: ERM Reference	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20 — Number Daily Renewals: 4

Date: 08/04/2011 20 day endpoint — X 0700 AD renewal time/Initials X 1815 NW renewal time/Initials

Overlying Water: Emory River Water — X DS 12132 renewal time/Initials X 2400 KN renewal time/Initials

Overlying Water Batch ID (GLC Number): 9031 — Food: (Tetrafin 4g/L) TFS# 002 X Feed 1.5 ml/replicate new 1.0ml due to DO<3.0mg/L

X DS 6140 chemistries time/Initial — Screens Cleaned: X yes ☐ no ☐ n/a TB 100

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: nw /MLL
1					40	32	0.20	BHV
2								↓
3	22.7	7.00	2.8	95.6				
4	22.6	7.03	2.7	96.6	End mL: 29.9	End mL: 3.0		↓
5					Start mL: 28.9	Start mL: 1.4		* rep 5-11 larvae
6					mL used: 1.0	mL used: 1.6		BHV
7								* rep 7-12 larvae
8								BHV
9								* rep 9-12 larvae
10								BHV
11								↓
12								* rep 12-12 larvae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15%

$$RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$$

Ammonia Reporting Limits:

RL = Reporting Limit (0.10 mg/L).
MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10.
J = ≥ MDL and < RL.
U = Below MDL.

Observation Key:

AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MWS

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

☒ DS 6:55 Renewal time/initials ☒ 1200 MLL Renewal time/initials

☒ 1830 MLL Renewal time/initials ☒ 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# —— ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Not fed due to low DO<2.5 SAM

☒ DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	6	
1	22.1	1.7	NAV BHV
2	22.1	2.8	
3			
4			
5			
6			
7			
8			
9			
10			
11			AV
12			NAV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

☒ 0630 AD Renewal time/initials ☒ 1220 KN Renewal time/initials

☒ 1845 MLL Renewal time/initials ☒ 2340 DA Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				AV
2				
3				NAV
4				
5				AV Male M dge visible - Killed
6				NAV
7				
8				
9				
10	22.6	7.25	2.8	
11				
12	22.6	7.10	2.9	

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: NW

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	~~N~~ 0700 AD renewal time/Initials ~~X~~ 1815 NW renewal time/Initials
Overlying Water: Emory River Water	~~X~~ 1232 DJ renewal time/Initials ~~X~~ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 ~~X~~ Feed ~~1.5~~ ml/replicate NW 1.0 ml due to DO 23.0 mg/L
~~X~~ DS 6:00 chemistries time/Initial	Screens Cleaned: X yes □ no □ n/a TB 110

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: NW/MLL
1								BHV
2					36	32	0.08 J	1 male hatched ↓
3	22.4	7.01	2.9	96.8				* rep 3-12 larvae
4	22.4	6.92	2.9	97.3	End mL: 3.1	End mL: 13.7		~~F~~ 8/4/11 BHV
5					Start mL: 2.2	Start mL: 12.1		* rep 5-11 larvae
6					mL used: 0.9	mL used: 1.6		* rep 6-12 larvae
7					Dup:	Dup:	DUP	BHV
8					End: 18.0	End: 13.0	0.07 J	↓
9					Start: 17.0	Start: 11.5		↓
10					mL used:	mL used:		* rep 10-7, + 2 pupae
11					1.0	1.5		larvae BHV
12					40	30		1 pupae ↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: hw

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS~~ 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	6	
1	22.7	2.4	NAV
2	22.7	2.0	↓
3			AV
4			AV
5			NAV
6			
7			
8			
9			
10			BHV
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0630 AD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 SAM 8/3/11 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				Midge flew out - unknown sex SAM 8/3/11
2				Pupae visible
3				AV
4				~~Female~~ Male midge visible - killed SAM 8/3/11
5				NAV
6				
7				
8				
9				
10	22.6	7.15	3.4	
11				
12	22.6	7.01	3.3	

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	☒ 0700AM renewal time/Initials ☒ 1815 [illegible] renewal time/Initials
Overlying Water: Emory River Water	☒ 12:32 DS renewal time/Initials ☒ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 ☒ Feed 1.5 ml/replicate [illegible] 1.0ml due to DO<3.0mg/L
☐ DS 6100 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	~~40~~ KN 8/5/11	4	8	Int: [illegible] /MLL
1								BHV
2					48	32	0.08	* rep 2 - 11 larvae + 1 pupae
3	22.5	6.88	4.2	40.3			J	* rep 3 - 9 larvae + 2 pupae
4	22.5	6.94	3.3	96.4	End mL: 4.3	End mL: 5.1		1 male midge BHV
5					Start mL: 3.1	Start mL: 3.5		AV BHV
6					mL used: 1.2	mL used: 1.6		* 1 male midge rep 6: 11 larvae BHV
7								
8								
9								
10								* 1 male midge rep 10 - 8 larvae + 2 pupae
11								BHV
12								1 male midge

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

☒ DS 6:55 Renewal time/initials ☒ 1200 MLL Renewal time/initials

☒ 1830 MLL Renewal time/initials ☒ 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Not fed due to low DO <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials MLL	
Meter ID	40	6		
1	22.2	2.2	BHV	NAV
2	22.3	2.4	↓	↓
3			↓	↓
4			↓	↓
5				↓
6			BHV	↓
7			↓	↓
8				↓
9			BHV	↓
10			↓	↓
11			↓	↓
12				AV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

☒ 0830 AM Renewal time/initials ☒ 1220 KN Renewal time/initials

☒ 1845 MLL Renewal time/initials ☒ 2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

☒ DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				↓
3				↓
4				↓
5				↓
6				1 male midge
7				NAV
8				↓
9				↓
10	22.7	7.07	3.5	1 male midge
11	—	—	—	NAV
12	22.7	7.06	3.1	2 empty cases → 2 midges unknown sex SAM 8/3/11

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	✗ 0700 [illegible] renewal time/Initials ✗ 1815 [illegible] renewal time/Initials
Overlying Water: Emory River Water	✗ 05 12:32 renewal time/Initials ✗ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 067 ✗ Feed 1.5 ml/replicate [illegible] 1.0 ml due to DO <3.0 mg/L
✗ DS 6:00 chemistries time/Initial	Screens Cleaned: ✗ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: [illegible] /MLL
1								*rep 1 - 12 larvae ~~AV-pupae~~ 8/19/11 MLL
2					48	32	0.07	AV-pupae BHV
3	22.6	6.84	3.8	91.7				
4	22.6	6.94	~~3.5~~ DS 8/4/11 3.6	94.0	End mL: 5.5	End mL: 6.8	J	
5					Start mL: 4.3	Start mL: 5.2		
6					mL used: 1.2	mL used: 1.6		*rep 6 - 10 larvae
7								1 male midge BHV
8								
9								
10								
11								* rep 11 - 12 larvae
12								* rep 12 - 10 larvae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS~~ 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	6	
1	22.3	2.5	BHV NAV ← 1 midge
2	22.3	2.7	↓ ↓
3			
4			
5			
6			
7			AV
8			NAV
9			BHV ↓
10			AV
11			NAV
12			↓

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0830 AD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0122 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

~~X~~DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				1 male midge
2				NAV
3				↓
4				
5				
6				
7				
8				
9				
10	22.6	7.11	3.9	
11				
12	22.7	7.14	4.0	↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: nw

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	☒ 0700 AM renewal time/Initials ☒ 1815 nw renewal time/Initials
Overlying Water: Emory River Water	☒ 0.5 12:32 renewal time/Initials ☒ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 002 ☒ Feed ~~1.5~~ 1.0 ml/replicate nw 1.0ml due to DO <3.0mg/L
ADS 6:00 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: nw /MLL
1								* Rep ~~10~~ 1 - 10 larvae nw 8/14/11
2					48	32	0.05	* Rep 2 - 11 BHV
3	22.6	7.02	4.1	90.3			J	
4	22.6	7.15	4.5	92.5	End mL: 6.7	End mL: 8.6		* Rep 4 - 12 larvae 1 male midge BHV
5					Start mL: 5.5	Start mL: 7.0		
6					mL used: 1.2	mL used: 1.6		
7								
8								* Rep 8 - 10 larvae + 1 pupae BHV
9								
10								
11								
12								

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MJS

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~DS 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.4	2.7	BHV NAV
2	22.4	2.9	
3			
4			
5			
6			
7			
8			
9			
10			
11			AV
12			

Not fed due to low D.O. <2.5 SAM

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0620 MD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2340 DZ Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* MD	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				
3				
4				
5				
6				
7				
8				
9				
10	22.8	7.15	4.2	
11				
12	22.8	7.16	4.7	

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MMDS

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	☒ 0700 AM renewal time/Initials ☒ 815 MW renewal time/Initials
Overlying Water: Emory River Water	☒ 1232 DS renewal time/Initials ☒ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 007 ☒ Feed ~~1.5~~ ml/replicate MW 1.0ml due to DO<3.0mg/L
☒ DS 6100 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB 100

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MW / MLL
1								BHV
2					48	34	0.04	* rep 2 - 12 larvae
3	22.6	7.11	4.0	96.3				BHV
4	22.5	7.17	4.4	96.7	End mL: 7.9	End mL: 10.3	J	1 male midge
5					Start mL: 6.7	Start mL: 8.6		
6					mL used: 1.2	mL used: 1.7		* 1 male midge Rep 6 - 11 larvae
7								1 male midge AV
8								* Rep 8 - 12 larvae 8/14/11 MLL
9								BHV
10								
11								
12								* rep 12 - 11 larvae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS 6:55~~ Renewal time/initials ~~1200~~ MLL Renewal time/initials

~~1830~~ MLL Renewal time/initials ~~2310~~ MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~DS 6:40~~ chemistries time/Initial MLL 1145

Not fed due to low D.O. <2.5 SAM

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.4	3.4	BHV NAV
2	22.5	3.1	AV
3			AV
4			NAV
5			
6			
7			
8			
9			
10			
11			
12			AV 1 Dead

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~1620~~ AN Renewal time/initials ~~1220~~ KN Renewal time/initials

~~1845~~ MLL Renewal time/initials ~~2340~~ DP Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0612 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~DS 6:00~~ chemistries time/Initial

Replicate	Temperature (23± 1°C)* AN	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				
3				
4				
5				
6				
7				
8				
9				
10	22.8	7.18	4.2	
11				
12	22.8	7.18	4.7	

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: Mwt

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	~~0700~~ MD renewal time/Initials ~~1815~~ MWT renewal time/Initials
Overlying Water: Emory River Water	~~1232~~ DS renewal time/Initials ~~2355~~ KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 ~~X~~ Feed ~~1.5~~ ml/replicate MWT 1.0ml due to DO <3.0mg/L
~~DS~~ 6100 chemistries time/Initial	Screens Cleaned: ~~X~~ yes □ no □ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MWT /MLL
1								* rep 1-12 larvae
2					40	34	0.02	* rep 2-12 larvae
3	22.6	~~7.11~~ DS 8/14/11 7.33	4.6	101.7				BHV
4	22.6	~~7.11~~ DS 8/14/11 7.24	4.9	96.0	End mL: 8.9	End mL: 12.1	U	
5					Start mL: 7.9	Start mL: 10.4		
6					mL used: 1.0	mL used: 1.7		
7								
8								
9								* rep 9-12 larvae
10								BHV
11								
12								* Rep 12-7, + 2 pupae MWT/MLL larvae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates. *20 day endpoints

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS~~ 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~DS~~ 6:40 chemistries time/Initial MLL 1145

Not fed due to low D.O. <2.5 SAM

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.8	2.7	~~NAV~~ AV BHV
2	22.6	2.1	
3			
4			
5			
6			
7			AV
8			AV
9			NAV
10			
11			AV
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0630 MD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* MD	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				
3				
4				
5				
6				1 male midge
7				AV
8				NAV
9				
10	22.7	6.99	3.2	
11				AV
12	22.9	6.88	3.1	NAV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: nwr

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 end point	X 0700 AD renewal time/Initials X 1815 nwr renewal time/Initials
Overlying Water: Emory River Water	X 1232 DS renewal time/Initials X 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 X Feed 1.5 ml/replicate nwr 1.0ml due to DO <3.0 mg/L
X DS 6:00 chemistries time/Initial	Screens Cleaned: X yes ☐ no ☐ n/a TB 1w

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: nwr /MLL
1								BHV
2					44	32	0.07	AV-pupae ↓
3	22.6	6.89	2.9	93.2				* Rep 3-10 larvae
4	22.6	6.95	2.7	96.1	End mL: 10.0	End mL: 26.2	J	* Rep 4-12 larvae
5					Start mL: 8.9	Start mL: 24.6		BHV
6					mL used: 1.1	mL used: 1.6		↓
7								1 male midge, AV-pupae, BHV
8								* 1 male midge Rep 8-10 larvae
9								* Rep 9-11 larvae
10								~~Rep~~ nwr BHV
11								* Rep 11-12 larvae
12								BHV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint; Tech error 5 reps were terminated instead of 4 reps nwr

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ DS 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate Not fed due to low D.O. CLS SAM

Screens Cleaned: ☐ yes ~~X~~ no ☐ n/a

~~X~~DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.6	3.1	NAV BHV
2	22.5	2.4	
3			
4			
5			
6			
7			
8			
9			
10			
11			AV
12			NAV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ 0630 AD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0U2 SAM ~~X~~ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ~~X~~ no ☐ n/a LO SAM 8/3/11

~~X~~DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				↓
3				↓
4				1 male midge
5				NAV
6				↓
7				↓
8				↓
9				↓
10	22.8	6.92	3.2	↓
11	—	—	—	↓
12	22.8	7.00	3.1	↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

Sample ID: ERM 1.0
Concentration: 20%

TVA: 5069-03

Emory River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day end point	☒ 0700 AM renewal time/Initials ☒ 1815 MV renewal time/Initials
Overlying Water: Emory River Water	☒ 12:32 DS renewal time/Initials ☒ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9037	Food: (Tetrafin 4g/L) TFS# 062 ☒ Feed 1.5 ml/replicate Mus 1.0 ml due to DO <3.0 mg/L
☒ DS 6:00 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB 100

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: Mus /MLL
1								BHV
2					44	30	0.07	* 1 male midge rep 2-10 larvae
3	22.7	6.93	3.0	90.7			J	* Rep 3-12 larvae
4	22.6	6.98	3.4	92.4	End mL: 11.1	End mL: 27.7		* Rep 4-11 larvae
5					Start mL: 10.0	Start mL: 26.2		BHV
6					mL used: 1.1	mL used: 1.5		
7								
8								
9								
10								
11								* Rep 11-12 larvae
12								BHV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X DS 6:55 Renewal time/initials X 1300 MLL Renewal time/initials

X 1830 MLL Renewal time/initials X 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# —— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. 2.5 SAM

Screens Cleaned: ☐ yes X no ☐ n/a

X DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.5	1.7	NAV BHV
2	22.4	2.7	↓ ↓
3			↓ ↓
4			AV ↓
5			NAV ↓
6			↓ ↓
7			↓ ↓
8			↓ ↓
9			↓ ↓
10			↓ ↓
11			↓ ↓
12			↓ ↓

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X 0630 AN Renewal time/initials X 1220 AN Renewal time/initials

X 1845 MLL Renewal time/initials X 2340 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM X Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes X no ☐ n/a

X DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AN	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				↓
3				↓
4				↓
5				↓
6				↓
7				↓
8				↓
9				Pupae visible → 1 MALE MIDGE 23:[illegible]
10	22.8	7.01	3.3	NAV
11				↓
12	22.8	6.94	3.7	↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

Sample ID: ERM 1.0
Concentration: 40%

TVA: 5069-03

Emory River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	~~0100~~ AO renewal time/Initials ~~1815~~ [illegible] renewal time/Initials
Overlying Water: Emory River Water	~~1232~~ DS renewal time/Initials ~~2355~~ KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 0608 ~~Feed 1.5~~ ml/replicate [illegible] 1.0ml due to DO<3.0mg/L
~~DS~~ 6:00 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB 160

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: [illegible] /MLL
1								AV- pupae BHV
2					40	32	0.06 J	* Rep 2-12 larvae
3	22.6	6.96	3.3	93.3				* Rep 3-12 larvae
4	22.5	6.92	3.~~1~~ 3.4	91.6	End mL: 12.1	End mL: 29.3		BHV
5			DS 9/28/11		Start mL: 11.1	Start mL: 27.7		
6					mL used: 1.0	mL used: 1.6		
7								
8								
9								* Rep 9-10 10 larvae + 1 pupae
10								BHV
11								* Rep 11-12 larvae
12								BHV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates. * 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ DS 6:55 Renewal time/initials ~~X~~ 1300 MLL Renewal time/initials

~~X~~ 1830 MLL Renewal time/initials ~~X~~ 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~ DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.3	2.7	AV BHV
2	22.2	2.3	NAV
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ 0620 KN Renewal time/initials ~~X~~ 1220 KN Renewal time/initials

~~X~~ 1845 MLL Renewal time/initials ~~X~~ 2340 OR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~ DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* KN	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				Pupae visible
3				NAV
4				↓
5				↓
6				1 Dead partially emerged midge
7				NAV
8				↓
9				↓
10	22.8	~~6.92~~ 7.07 DS 8/3/11	3.7	1 male midge
11				NAV
12	22.8	7.02	3.5	AV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day end point	X 0700 AS renewal time/Initials X 1815 [illegible] renewal time/Initials
Overlying Water: Emory River Water	X 1232 DS renewal time/Initials X 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 X Feed 1.5 ml/replicate Nutr 1.0 ml due to DO <3.0 mg/L
DS 6:00 chemistries time/Initial	Screens Cleaned: X yes □ no □ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: nutr /MLL
1								* Rep 1-7, 1 pupae larvae BHV
2					44	30	0.06	
3	22.5	6.93	4.1	90.5				↓
4	22.6	6.97	3.7	93.7	End mL: 13.2	End mL: 30.8	J	↓
5					Start mL: 12.1	Start mL: 29.3		* Rep 5-12 larvae
6					mL used: 1.1	mL used: 1.5		BHV
7								↓
8								* Rep 8-12 larvae
9								BHV
10								* Imidge, make Rep 10-9 larvae
11								AV BHV
12								AV-pupae ↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates. *

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

☒ DS 6:55 Renewal time/initials ☒ 1200 MLL Renewal time/initials

☒ 1830 MLL Renewal time/initials ☒ 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <25 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.3	3.1	DS 8/2/11 ~~AV~~ BHV NAV
2	22.3	3.1	AV
3			NAV
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

☒ 0630 KN Renewal time/initials ☒ 1220 KN Renewal time/initials

☒ 1845 MLL Renewal time/initials ☒ 2340 DP Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

☒ DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	L	
1				NAV
2				↓
3				↓
4				1 male midge
5				NAV
6				↓
7				↓
8				↓
9				↓
10	22.6	7.05	3.8	↓
11				↓
12	22.8	7.04	3.6	↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	X 0700 AD renewal time/Initials X 1815 MW renewal time/Initials
Overlying Water: Emory River Water	X 12:32 DS renewal time/Initials X 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 X Feed ~~1.5~~ 1.0 ml/replicate MW 1.0 ml due to DO < 3.0 mg/L
X DS 6:00 chemistries time/Initial	Screens Cleaned: X yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MW /MLL
1								* Rep 1-12 larvae
2					52	32	0.03	BHV
3	22.6	6.99	4.2	91.6				* Rep 3-12 larvae
4	22.0	7.10	4.5	92.7	End mL: 14.5	End mL: 32.4	U	BHV
5					Start mL: 13.2	Start mL: 30.8		
6					mL used: 1.3	mL used: 1.6		
7								* Rep 7-11 larvae
8								* Rep 8-12 larvae
9								BHV
10								
11								
12								AV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X DS 6:55 Renewal time/initials X 1200 MLL Renewal time/initials

X 1830 MLL Renewal time/initials X 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. 22.5 SAM

Screens Cleaned: ☐ yes X no ☐ n/a

X DS 6:40 chemistries time/Initial MLL 1145

Replicate	Temperature (23± 1°C)* MLL	Dissolved Oxygen (mg/L)*	Observations Initials DS
Meter ID	40	6	
1	22.3	2.6	NAV BHV
2	22.5	3.3	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X 0830 AM Renewal time/initials X 1220 KN Renewal time/initials

X 1845 MLL Renewal time/initials X 2340 OR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM X Feed ~~1.5~~ ml/replicate 1.0 SAM 8/3/11

Screens Cleaned: ☐ yes X no ☐ n/a

X DS 6:00 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	4	6	
1				NAV
2				
3				
4				
5				
6				
7				
8				
9				
10	22.8	7.13	4.3	
11				
12	22.8	7.11	4.5	

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	☒ 0700 AM renewal time/Initials ☒ 1815 [illegible] renewal time/Initials
Overlying Water: Emory River Water	☒ 12:32 DS renewal time/Initials ☒ 2355 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 063 ☒ Feed ~~1.5~~ ml/replicate [illegible] 1.0 due to DO <3.0 mg/L
☒ DS 6:00 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: [illegible] /MLL
1								BHV
2					44	34	0.03	↓
3	22.5	7.12	4.0	95.6				↓
4	22.6	7.20	3.9	97.3	End mL: 15.6	End mL: 34.1	U	* Rep 4-12 larvae
5					Start mL: 14.5	Start mL: 32.4		BHV
6					mL used: 1.1	mL used: 1.7		↓
7								* Rep 7-12 larvae
8								* Rep 8-11 larvae
9								* Rep 9-9 larvae
10								BHV
11								↓
12								↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MWS

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS 6:55~~ Renewal time/initials ~~1200~~ MLL Renewal time/initials

~~1830~~ MLL Renewal time/initials ~~2310~~ MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. 2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~1145~~ MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.0	3.1	NAV
2	23.0	3.9	
3			
4			
5			
6			
7			AV
8			NAV
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~0630~~ AM Renewal time/initials ~~1220~~ KN Renewal time/initials

~~1845~~ MLL Renewal time/initials ~~2350~~ OZ Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0U2 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

~~DS 6:31~~ chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV
2				
3				
4				
5	22.7	7.11	2.7	
6				
7				
8	22.8	6.91	3.0	
9				
10				
11				
12				AV - pupae

1 empty case

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: nw

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20 — Number Daily Renewals: 4

Date: 08/04/2011 20 day endpoint — X 0700 AD renewal time/Initials X 1815 nw renewal time/Initials

Overlying Water: Emory River Water — X 1232 DS renewal time/Initials X 2400 KN renewal time/Initials

Overlying Water Batch ID (GLC Number): 9031 — Food: (Tetrafin 4g/L) TFS# 067 X Feed 1.5 ml/replicate mw 1.0 ml due to DO 23.0 mg/L

X DS 6:40 chemistries time/Initial — Screens Cleaned: X yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: nw /MLL
1								BHV
2					44	32	0.10	
3	22.0	6.95	3.1	94.0				1 male midge
4	22.5	7.01	3.2	98.4	End mL: 31.0	End mL: 38.0		
5					Start mL: 29.9	Start mL: 36.4		
6					mL used: 1.1	mL used: 1.6		* Rep 6 - 10 larvae + 1 pupae
7								BHV
8								AV-pupae
9								* Rep 9 - 11 larvae
10								BHV
11								* Rep 11 - 8 larvae + 3 pupae
12								* Rep 12 - 6 larvae + 1 pupae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

DS 9/27/11

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: DWS

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X DS 6:55 Renewal time/initials X 1200 MLL Renewal time/initials

X 1830 MLL Renewal time/initials X 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

X 1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.0	3.4	NAV
2	23.0	3.3	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X 0630 AM Renewal time/initials X 1220 KN Renewal time/initials

X 1845 MLL Renewal time/initials X 2350 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

X DS 6:31 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV
2				
3				BHV
4				
5	22.7	7.05	3.7	
6				
7				
8	22.8	7.07	3.5	
9				
10				
11				
12				

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

DS 9/27/11

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	☒ 0700 AD renewal time/Initials ☒ 1815 MW renewal time/Initials
Overlying Water: Emory River Water	☒ DS 12:32 renewal time/Initials ☒ 2400 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 0607 ☒ Feed ~~1.5~~ ml/replicate [illegible] 1.0 ml due to DO 23.0 mg/L
☒ DS 6:40 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: [illegible] /MLL
1								BHV
2					40	34	0.10	* Rep 2 - 11 larvae
3	22.4	6.95	2.8	95.1				* Rep 3 - 11 larvae
4	22.4	6.98	2.8	94.2	End mL: 32.0	End mL: 39.8		BHV
5					Start mL: 31.0	Start mL: 38.1		
6					mL used: 1.0	mL used: 1.7		
7								
8								
9								
10								* Rep 10 - 12 larvae
11								AV BHV
12								* Rep 12 - 12 larvae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

DS 9/27/11

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS~~ 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.1	3.7	NAV
2	23.1	3.5	
3			
4			
5			
6			AV
7			NAV
8			AV
9			NAV
10			
11			
12			AV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0630 AM Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2350 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:31 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV BHV
2				
3				
4				
5	22.9	7.18	4.3	
6				BHV
7				
8	22.9	7.20	4.0	
9				
10				
11				
12				AV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

Sample ID: ERM 2.5 DS 9/27/11

Concentration: 40%

TVA: 5069-03

Emory River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	☒ 0700 AD renewal time/Initials ☒ 1815 [illegible] renewal time/Initials
Overlying Water: Emory River Water	☒ 12:32 DS renewal time/Initials ☒ KN 2400 renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 ☒ Feed 1.5 ml/replicate [illegible] 1.0 mL due to DO<3.0 mg/L
DS 1:40 chemistries time/Initial	Screens Cleaned: ☒ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: [illegible] / MLL
1								*Rep 1 - 12 larvae
2					52	36	0.06	AV BHV
3	22.4	7.11	3.3	97.2				
4	22.4	7.16	3.6	98.8	End mL: 33.3	End mL: 41.6	J	
5					Start mL: 32.0	Start mL: 39.8		*Rep 5 - 12 larvae
6					mL used: 1.3	mL used: 1.8		*Rep 6 - 10 larvae + 1 pupa BHV
7								
8								
9								
10								
11								
12								*Rep 12 - 9 larvae + 1 pupa

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day larvae endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

DS 9/27/11

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

DS 6:55 Renewal time/initials 1200 MLL Renewal time/initials

1830 MLL Renewal time/initials 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.0	4.0	NAV
2	23.0	4.2	↓
3			↓
4			↓
5			↓
6			↓
7			↓
8			AV
9			NAV
10			AV
11			NAV
12			↓

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

0630 AD Renewal time/initials 1220 KN Renewal time/initials

1845 MLL Renewal time/initials 2350 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

DS 6:31 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL	
Meter ID	40	4	6		
1				NAV	BHV
2				↓	↓
3				↓	↓
4				↓	↓
5	22.7	7.22	4.7	↓	↓
6				↓	↓
7				↓	↓
8	22.7	7.28	4.7	↓	↓
9				AV	↓
10				NAV	↓
11				↓	↓
12				↓	↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

DS 9/27/11

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	X 0700 AD renewal time/Initials ~~X~~ 1815 NW renewal time/Initials
Overlying Water: Emory River Water J	X 1232 DS renewal time/Initials ~~X~~ KN 2400 renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 060 ~~X~~ Feed ~~1.5~~ ml/replicate NW 1.0 ml due to DO<3.0 mg/L
X DS 6:40 chemistries time/Initial	Screens Cleaned: X yes ☐ no ☐ n/a TB 1:00

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: NW /MLL
1								* Rep 1-12 larvae
2					44	~~56~~ 36 KN 8/10/11	0.03	BHV
3	22.4	7.23	3.9	100.9			U	
4	22.4	7.30	4.2	102.8	End mL: 34.4	End mL: 43.4		
5					Start mL: 33.3	Start mL: 41.6		
6					mL used: 1.1	mL used: 2.8 KN 8/10/11		
7								* Rep 7-11 larvae
8								BHV
9								* Rep 9-12 larvae
10								BHV
11								
12								* Rep 12-11 larvae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates. * 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MWS

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X DS 6:55 Renewal time/initials X 1200 MLL Renewal time/initials

X 1830 MLL Renewal time/initials X 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

X 1145 MLL chemistries time/Initial

Not fed due to low D.O. 2.5 SAM

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	22.9	5.0	BHV
2	22.9	4.6	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X 0830 AM Renewal time/initials X 1220 KN Renewal time/initials

X 1845 MLL Renewal time/initials X 2350 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

X DS 6:31 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV BHV
2				
3				
4				
5	22.7	7.28	5.1	
6				
7				
8	22.7	7.27	5.4	
9				
10				
11				
12				AV

Ideal chironomid removed

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: nw

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day end point	~~X~~ 0700 AD renewal time/Initials ~~X~~ 1815 nw renewal time/Initials
Overlying Water: Emory River Water	~~X~~ 1232 DS renewal time/Initials ~~X~~ 2400 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 0102 ~~X~~ Feed ~~1.5~~ ml/replicate mult 1.0 ml due to DO <3.0 mg/L
~~X~~ DS 6:40 chemistries time/Initial	Screens Cleaned: ~~X~~ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	48	4	6	113	—	4	8	Int: nw /MLL
1								* Sept 9 larvae
2					40	34	0.03	BHV
3	DS 8/4/11 ~~24.3~~ 22.3	7.26	4.5	95.0			U	↓
4	~~24.4~~ 22.4	7.20	4.8	93.9	End mL: 35.4	End mL: 45.1		↓
5	DS 8/4/11				Start mL: 34.4	Start mL: 43.4		* Sep 5 - 10 larvae
6					mL used: 1.0	mL used: 1.7		* Sep 6 12 larvae
7								* Sep 7-10 larvae
8								8/4/11 MLL AV-~~pupae~~ larvae BHV
9								↓
10								
11								AV
12								↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates. * 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(S_1 - S_2)}{(S_1 + S_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MMT

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ DS 6:55 Renewal time/initials ~~X~~ 1200 MLL Renewal time/initials

~~X~~ 1830 MLL Renewal time/initials ~~X~~ 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~ 1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	22.8	5.0	BVH
2	22.8	5.2	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ 0630 AD Renewal time/initials ~~X~~ 1220 KN Renewal time/initials

~~X~~ 1845 MLL Renewal time/initials ~~X~~ 2350 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 062 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~ DS 6:31 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV BHV
2				AV
3				NAV
4				
5	22.7	7.22	5.4	
6				
7				
8	22.6	7.23	5.6	AV
9				NAV
10				
11				
12				AV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: mwb

GLC#: 8985

Sample ID: ERM 2.5 Concentration: 100%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/11

Test Initiation Date: 07/15/11

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS <24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20

Date: 08/04/2011 20 day endpoint

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

DDS 6:40 chemistries time/Initial

Number Daily Renewals: 4

~~0700 AD~~ renewal time/Initials ~~1515~~ mw renewal time/Initials

~~1232~~ DS renewal time/Initials ~~2400~~ KN renewal time/Initials

Food: (Tetrafin 4g/L) TFS# 062 ~~1.5~~ ml/replicate mw 1.0 ml due to DO<3.0

Screens Cleaned: ~~X~~ yes ☐ no ☐ n/a TB 1.0

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: mw /MLL
1								BHV
2					40	32	0.03	↓
3	22.4	7.23	5.1	93.3			U	
4	22.3	7.23	4.7	94.2	End mL: 36.4	End mL: 46.7		↓
5					Start mL: 35.4	Start mL: 45.1		* Dup 5 - 8 larvae
6					mL used: 1.0	mL used: 1.6	DUP	BHV
7					DUP	DUP	0.04 J	* Dup 7 - 5 larvae
8					End: 19.1	End: 14.6		BHV
9					Start: 18.1	~~Used~~ Start 13.0 KN 8/4/11		* Dup 9 - 4+1 pupae larvae BHV
10					mL used:	mL used:		
11								↓
12					40 1.0	32 1.6		* Dup 12 - 6 larvae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15%

$$RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$$

Ammonia Reporting Limits:

RL = Reporting Limit (0.10 mg/L).

MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10.

J = ≥ MDL and < RL.

U = Below MDL.

Observation Key:

AV: Animals Visible

NAV: No Animals Visible

FOV: Foreign Organism Visible

BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MWJ

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~DS 6:59 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate Not fed due to low D.O. SAM <2.5

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.7	2.7	NAV
2	23.6	2.8	
3			
4			
5			
6			
7			
8			
9			
10			
11			FAV
12			NAV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0630 AD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2355 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 061 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a SAM 8/3/11

~~X~~DS 6:43 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				AV-pupae
2				NAV
3				BHV NAV - 3 males hatched - DR
4				AV - 1 male hatched
5	22.9	6.92	4.1	NAV
6				BHV NAV
7				NAV
8	23.0	6.98	2.7	AV-pupae - 1 MALE HATCHED - DR
9				NAV
10				↓
11				BHV NAV
12				↓ ↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: mw

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011	X 0700 AD renewal time/Initials X 1515 mw renewal time/Initials
Overlying Water: Emory River Water	1212 DS renewal time/Initials 2405 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 62 ☐ Feed ~~1.5~~ 1.0 ml/replicate mw 1.0ml due to DO <3.0mg/L
DS 6:40 chemistries time/Initial	Screens Cleaned: X yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: mw /MLL
1								* Rep 1- 7 + 1 pupa BHV
2					44	34	0.07	↓
3	22.9	7.07	3.1	102.7			J	1 male midge DS BHV
4	22.8	7.05	3.0	100.1	End mL: 37.5	End mL: 48.4		BHV
5					Start mL: 36.4	Start mL: 46.7		↓
6					mL used: 1.1	mL used: 1.7		* Rep 6- 7 larval + 2 pupae
7								* Rep 7- 12 larvae
8								BHV
9								* Rep 9- 11 larvae + 1 pupae
10								BHV
11								↓
12								↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MMS

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ DS 6:55 Renewal time/initials ~~X~~ 1200 MLL Renewal time/initials

~~X~~ 1830 MLL Renewal time/initials ~~X~~ 2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~ 1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.6	3.3	AV
2	23.5	3.4	NAV
3			↓
4			Pupae visible
5			NAV
6			↓
7			↓
8			↓
9			↓
10			↓
11			AV
12			NAV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ 0630 AD Renewal time/initials ~~X~~ 1220 KN Renewal time/initials

~~X~~ 1845 MLL Renewal time/initials ~~X~~ 2355 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 061 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a SAM 8/3/11

~~X~~ DS 6:43 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV
2				↓
3				AV-pupae — 1 male hatched - DR
4		7.05		AV — 1 male hatched
5	23.1	~~7.09~~ 7.05 8/3/11	3.8	NAV
6				AV-pupae — 1 male hatched - DR
7				AV-pupae — 1 male hatched - DR
8	23.3	7.08	3.6	AV — 1 male hatched - DR
9				↓
10				NAV
11				↓
12				↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	✗ 0700 AD renewal time/Initials ✗ 1515 MW renewal time/Initials
Overlying Water: Emory River Water	✗ 1232 DS renewal time/Initials ✗ 2405 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 002 ✗ Feed ~~1.5~~ 1.0 ml/replicate MW 1.0 ml due to DO <3.0 mg/L
✗ DS 6:40 chemistries time/Initial	Screens Cleaned: ✗ yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MW /MLL
1								* Rep 1 - 12 larvae
2					40	34	0.07	BHV
3	22.9	6.99	DS 8/14/11 ~~9.8~~ 3.4	98.3			J	↓
4	22.9	7.04	3.3	99.9	End mL: 38.5	End mL: 27		* Rep 4 - 11 larvae
5					Start mL: 37.5	Start mL: 1.0		* Rep 5 - 11 larvae
6					mL used: 1.0	mL used: 1.7		BHV
7								* Rep 7 - 11 larvae
8								BHV
9								↓
10								
11								
12								

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: hwb

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X DS 6:55 Renewal time/initials X1200 MLL Renewal time/initials

X1830 MLL Renewal time/initials X2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate Not fed due to low D.O. <2.5

Screens Cleaned: ☐ yes ☒ no ☐ n/a

X1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.5	3.8	NAV
2	23.5	3.2	↓
3			↓
4			↓
5			↓
6			↓
7			↓
8			↓
9			AV
10			NAV
11			AV
12			NAV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

X 0630 AD Renewal time/initials X1220 KN Renewal time/initials

X1845 MLL Renewal time/initials X2355 DR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0161 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

X DS 6:43 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV
2				↓ BHV
3				↓
4				AV
5	23.3	7.13	4.7	NAV
6				AV
7				NAV
8	23.3	7.20	3.9	AV
9				NAV
10				AV
11				↓
12				↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

GLEC Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: Mus

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	X 0700 AD renewal time/Initials ~~D~~ 1815 Mus renewal time/Initials
Overlying Water: Emory River Water	~~X~~ 1215 DS renewal time/Initials ~~X~~ 2405 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 X Feed ~~1.5~~ 1.0 ml/replicate Mus 1.0ml due to DO < 3.0mg/L
~~X~~ DS 10:40 chemistries time/Initial	Screens Cleaned: X yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: Mus /MLL
1								BHV
2					44	34	0.04	1 midge male
3	23.0	7.23	3.3	102.4			J	* Rep 3 - 12 larvae
4	23.0	7.05	4.0	93.9	End mL: 39.6	End mL: 4.4		BHV
5					Start mL: 38.5	Start mL: 2.7		* Rep 5 - 12 larvae
6					mL used: 1.1	mL used: 1.7		BHV
7								* 1 midge male Rep 7 - 11 larvae
8								* Rep 8 - 12 larvae
9								BHV
10								↓
11								
12								

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~0~~ DS 6:55 Renewal time/initials ~~0~~1200 MLL Renewal time/initials

~~0~~1830 MLL Renewal time/initials ~~0~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~0~~1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	10	
1	23.5	3.8	NAV
2	23.5	4.3	↓
3			AV
4			NAV
5			↓
6			
7			
8			
9			
10			
11			↓
12			AV

Not fed due to low D.O. <2.5 SAM

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~0~~0430 AM Renewal time/initials ~~0~~1220 KN Renewal time/initials

~~0~~1845 MLL Renewal time/initials ~~0~~2355 DP Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 061 SAM ☒ Feed ~~1.5~~ ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a 1.0 SAM 8/3/11

~~0~~DS 6:43 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AM	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				AV
2				NAV
3				↓
4				↓
5	23.3	7.29	4.9	AV
6				NAV
7				↓
8	23.3	7.32	4.7	↓
9				↓
10				AV
11				NAV
12				↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	X0700 AD renewal time/Initials X1815 [illegible] renewal time/Initials
Overlying Water: Emory River Water	X1232 DS renewal time/Initials X2405 [illegible] KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 067 X Feed 1.5 ml/replicate 1.0ml due to DO<3.0mg/L
X DS 6:40 chemistries time/Initial	Screens Cleaned: X yes □ no □ n/a TB 1.0ml

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: [illegible] /MLL
1								BHV
2					44	34	0.04	↓
3	22.9	7.10	4.1	98.1			J	↓
4	22.9	7.13	4.5	97.2	End mL: 40.7	End mL: 6.2		* Rep 4-12 larva
5					Start mL: 39.6	Start mL: 4.5		AV BHV
6					mL used: 1.1	mL used: 1.7		↓
7								* Rep 7-11 larva
8								BHV
9								↓
10								* Rep 10-10 larva
11								* Rep 11-10 larva
12								BHV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates. * 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by [illegible]

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~0~~ DS 6:55 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# —— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. 22.5 SAM

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.5	4.9	BHV
2	23.4	4.7	
3			
4			AV
5			
6			
7			
8			
9			
10			
11			
12			AV

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~0630 AD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2355 OR Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 0411 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~DS 6:43 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV
2				
3				
4				
5	23.2	7.18	5.2	
6				
7				BHV
8	23.2	7.24	5.6	
9				
10				AV
11				
12				NAV

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

Sample ID: ERM 3.5
Concentration: 80%

TVA: 5069-03

Emory River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	✗ 0700 AD renewal time/Initials ✗ 1815 MW renewal time/Initials
Overlying Water: Emory River Water	✗ 1213 DS renewal time/Initials ✗ 2405 KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 062 ✗ Feed ~~1.5~~ 1.0 ml/replicate MW 1.0ml due to DO < 3.0 mg/L
✗ DS 6:40 chemistries time/Initial	Screens Cleaned: ✗ yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MW /MLL
1								1 dead larvae - removed BHV
2					40	32	0.04	
3	22.9	7.12	4.7	93.4				
4	22.8	7.19	4.9	94.6	End mL: 41.7	End mL: 7.8	J	
5					Start mL: 40.7	Start mL: 6.2		* Rep 5 - 10 larvae BHV
6					mL used: 1.0	mL used: 1.6		
7								AV
8								* Rep 8 - 10 larvae BHV
9								
10								* Rep 10 - 10 larvae
11								* Rep 11 - 10 larvae BHV
12								

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: nwb

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 18 Date: 08/02/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~DS~~ 6:35 Renewal time/initials ~~X~~1200 MLL Renewal time/initials

~~X~~1830 MLL Renewal time/initials ~~X~~2310 MLL Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate Not fed due to low D.O. 22.5

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~1145 MLL chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials SAM
Meter ID	40	6	
1	23.4	5.0	BHV
2	23.4	5.4	AV
3			
4			
5			AV
6			↓
7			AV
8			
9			AV
10			
11			
12			↓

Test Day: Day 19 Date: 08/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9031

Number Daily Renewals: 4

~~X~~ 0630 AD Renewal time/initials ~~X~~1220 KN Renewal time/initials

~~X~~1845 MLL Renewal time/initials ~~X~~2355 DA Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 061 SAM ☒ Feed ~~1.5~~ 1.0 ml/replicate SAM 8/3/11

Screens Cleaned: ☐ yes ☒ no ☐ n/a

~~X~~ 09 6:43 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	4	6	
1				NAV BHV
2				↓
3				AV
4				↓
5	23.0	7.19	5.4	NAV
6				↓
7				AV
8	23.0	7.22	5.6	↓
9				NAV
10				↓
11				
12				↓ ↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 20	Number Daily Renewals: 4
Date: 08/04/2011 20 day endpoint	~~0700~~ AD renewal time/Initials ~~1515~~ MW renewal time/Initials
Overlying Water: Emory River Water	~~1232~~ DS renewal time/Initials ~~2405~~ KN renewal time/Initials
Overlying Water Batch ID (GLC Number): 9031	Food: (Tetrafin 4g/L) TFS# 62 ~~1.5~~ Feed 1.0 ml/replicate MW 1.0 ml due to DO < 3.0 mg/L
~~DS~~ 6:40 chemistries time/Initial	Screens Cleaned: ~~X~~yes ☐ no ☐ n/a TB

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness* mg/L $CaCO_3$ KN	Alkalinity* mg/L $CaCO_3$ KN	Ammonia* (as N) MLL	Observations/ 12 organisms per replicate
Record Meter ID	40	4	6	113	—	4	8	Int: MW /MLL
1								* Rep 1-10 burrow
2					36	30	0.04	BHV
3	22.8	7.07	5.5	93.9				AV ↓
4	22.8	7.10	6.80 0858 4/11	93.2	End mL: 42.6	End mL: 9.4	J	* Rep 4-11 burrow
5					Start mL: 41.7	Start mL: 7.9		BHV
6					mL used: 0.9	mL used: 1.5		↓
7								↓
8								* Rep 8-11 burrow
9								* Rep 9-12 burrow
10								AV BHV
11								↓
12								↓

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

* 20 day endpoint

Relative % Difference: RPD ≤15% $RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: GLW

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: GLW	4	12	0.83693	0.82807	0.00886 MWS 8/8/11	12	~~0.73750~~ MWS 8/8/11 ~~0.738~~ DS 8/8/11 0.73823	~~0.73~~ ~~0.738~~ C 0.73750 MWS 8/8/11 0.73833
	6	12	0.87238	0.86272	0.00966	9	1.07333	0.80500
GLEC Number:	9	12	0.85529	0.84783	0.00746	12	0.62167 MWS 8/8/11	0.62167 MWS 8/8/11
	11	12	0.85605	0.84674	0.00931	12	0.77583	0.77583
					DS		DS	DS
						AVERAGE:	0.80229	0.73521

* There were no pupae or midges observed on Day 20. Therefore, there were no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: LCS + GLW

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/2011 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 11- 1330

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: LCS+GLW	3	12	0.83538	0.82241	0.01297	12	1.08083	1.08083
	6	12	0.84062	AD 8/8/11 0.82685	0.01377	11	1.25182	1.14750
GLEC Number:	10	12	0.84092	0.82707	0.01385	11	1.25909	1.15417
	11	12	0.83881 KN 8/15/11	0.82680	0.01201	12	1.00083	1.00083
					DS		DS	DS
						AVERAGE:	1.14814	1.09583

*There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: LCS + ERW

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: LCS + ERW	1	12	0.84500	0.82672	0.01828	12	1.52333	1.52333
	2	12	0.84466	0.83082	0.01384	11	1.25818	1.15333
GLEC Number:	4	12	0.83562	0.82350	0.01212	12	1.01000	1.01000
	10	12	0.83464	AD 8/8/11: 0.82125	0.01339	11	1.21727	1.11583
					nw		nw	nw
						AVERAGE:	1.25220	1.20062

*There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM REFERENCE

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g) AD	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM Reference GLEC Number: 8981	5	12	0.84850	AD 8/8/11 0.83391	0.01459	11	1.32636	1.21583
	7	12	0.83728	0.82211	0.01517	12	1.26417	1.26417
	9	12	0.85319	0.83697	0.01622	12	1.35167	1.35167
	12	12	0.85495	0.83802	0.01693	12	1.41083	1.41083
					nwt		nwt	nwt
						AVERAGE:	1.33826	1.31063

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: GLW, LCS + GLW, LCS + ERW, ERS(8897)+ERW

Test Dates: July 15 - September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment
Test Species: *Chironomus dilutus*

Group	Replicate Number	Day 0 Number Organisms at Test Initiation	Day 20 Number of Organisms Surviving	Day 20 Number Organisms Weighed	Day 20 Number of Pupae and Midge	Number of Organisms at Test initiation Minus Day 20 pupae and Midge	Dry Weight-mg pan/orgs after 24h	Weight of Ashed Pan/Orgs-mg	Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges
GLW	4	12	12	12	0	12	0.83693	0.82807	0.73833
GLW	6	12	9	9	0	12	0.87238	0.86272	0.80500
GLW	9	12	12	12	0	12	0.85529	0.84783	0.62167
GLW	11	12	12	12	0	12	0.85605	0.84674	0.77583
LCS+GLW	3	12	12	12	0	12	0.83538	0.82241	1.08083
LCS+GLW	6	12	11	11	0	12	0.84062	0.82685	1.14750
LCS+GLW	10	12	11	11	0	12	0.84092	0.82707	1.15417
LCS+GLW	11	12	12	12	0	12	0.83881	0.82680	1.00083
LCS+ERW	1	12	12	12	0	12	0.84500	0.82672	1.52333
LCS+ERW	2	12	11	11	0	12	0.84466	0.83082	1.15333
LCS+ERW	4	12	12	12	0	12	0.83562	0.82350	1.01000
LCS+ERW	10	12	11	11	0	12	0.83464	0.82125	1.11583
ERS + ERW	5	12	11	11	0	12	0.84850	0.83391	1.21583
ERS + ERW	7	12	12	12	0	12	0.83728	0.82211	1.26417
ERS + ERW	9	12	12	12	0	12	0.85319	0.83697	1.35167
ERS + ERW	12	12	12	12	0	12	0.85495	0.83802	1.41083

As per Rick Sherrard at TVA the Biomass statistical analysis were analyzed with out the inclusion of pupae or midges.

Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges

Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 0.5 – 10%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: MWJ

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID: ERM 0.5	3	12	0.85774	0.84297	0.01477	12	1.23083	1.23083	0	1.23083
	5	12	0.84672	0.83263	0.01409	11	1.28091	1.17417	1	1.28091
GLEC Number: 8982 10%	6	12	0.85383	0.83646	0.01737	12	1.44750	1.44750	0	1.44750
	10	12	0.84289	0.83315	0.00974	7	1.39143	0.81167	2	0.97400
					DS		DS	DS		
						AVERAGE:	1.33767	1.16604		

*Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 0.5-20%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/8/11 1240
mlw 8/7/11

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: mlw

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID:	2	12	0.84181	0.82840	0.01341	11	1.21909 ~~0.~~ DS 8/8/11	1.11750 mlw 8/8/11	1	1.21909
ERM 0.5	3	12	0.83338	0.82581	0.00757	9	0.84111	0.63083	2	0.75700
GLEC Number:	6	12	0.84744	0.83376	0.01368	11	~~0.~~ DS 8/8/11 1.24364	1.14000	1	1.24364
8982	10	12	0.84282	0.83290	0.00992	8	1.24000	0.82667	3	1.10222
20%					DS		DS	DS		
							AVERAGE: 1.13596	0.92875		

* Biomass weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 0.5 - 40%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID:	MWS 8/5/11 ~~3~~ 1	12	0.84155	0.82707	0.01448	12	1.20667	1.20667	0	1.20667
ERM 0.5	6	12	0.84175	0.82764	0.01411	10	1.41100	1.17583	1	1.28273
GLEC Number:	11	12	0.85456	0.83737	0.01719	12	1.43250 ~~1.14325~~ CB 8/9/11	1.43250 ~~1.14325~~ CB 8/9/11	0	1.43250
8982	12	12	0.84160	0.83013	0.01147 ~~0.01285~~ DS 8/15/11	10	1.14700	0.95583	2	1.14700
40%					DS		DS	DS		
						AVERAGE:	~~1.22698~~ KN 8/25/11 1.29929	~~1.12084~~ MWS 8/8/11	1.19271 KN 8/25/11	

* Biomass Weight (mg) - defined as the total Ash-Free - Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 0.5 – 60%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1040

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID:	1	12	0.84911	0.83894 4AP 8/8/11	0.01017	10	1.41700	1.18083	2	1.41700
ERM 0.5	2	12	0.84245	0.83007	0.01238	11	1.12545	1.03167	0	1.03167
GLEC Number:	4	12	0.84464	0.83275	0.01189	12	0.99083	0.99083	0	0.99083
8982	8	12	0.83273	0.82454	0.00819	10	0.818 900 DS 8/8/11	0.68250	1	0.74455
60 %					DS		DS	DS		
						AVERAGE:	1.08807	0.97146		

* Biomass weight (mg) - defined as the total Ash-free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 0.5 – 80%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnace

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/8/11 1800
Date/Time out: 8/8/11 11-1330

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) *Biomass Weight (mg)
Sample ID:	2	12	0.84814	0.83627	0.01187	12	0.98917	0.98917	0	0.98917
ERM 0.5	6	12	0.84498	0.83272	0.01226	11	1.11455	1.02167	1	1.11455
GLEC Number:	8	12	0.84981	0.83577	0.01404	12	1.17000	1.17000	0	1.17000
8982	12	12	0.84120	0.83148	0.00975	11	0.88636	0.81250	0	0.81250
80 %					DS		DS	DS		
							AVERAGE: 1.04002	0.99834		

*Biomass weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

KN 8/25/11

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 0.5 - 100%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100 - 1330

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID: ERM 0.5	1	12	0.83592	0.82588	0.01004	12	0.83667	0.83667	0	0.83667
	2	12	0.83648	0.82706	0.00942	12	0.78500	0.78500	0	0.78500
GLEC Number: 8982	9	12	0.83151	0.82174	0.00977	12	0.81417	0.81417	0	0.81417
	MWS 8/8/11					12			—	—
100 %	12	12	0.82806	0.82242	0.00564	7	0.80571	0.47000	2	0.56400
					DS		DS	DS		
						AVERAGE:	0.81039	0.72646		

* Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 0.5 (GLC No. 8982)

Test Dates: July 15 - September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment
Test Species: *Chironomus dilutus*

Group	Replicate Number	Day 0 Number Organisms at Test Initiation	Day 20 Number of Organisms Surviving	Day 20 Number Organisms Weighed	Day 20 Number of Pupae and Midge	Number of Organisms at Test initiation Minus Day 20 pupae and Midge	Dry Weight pan/orgs after 24h	Weight of Ashed Pan/Orgs	Biomass-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges		
ERM 0.5-10%	3	12	12	12	0	12	0.85774	0.84297	1.23083		
ERM 0.5-10%	5	12	12	11	1	11	0.84672	0.83263	1.28091		
ERM 0.5-10%	6	12	12	12	0	12	0.85383	0.83646	1.44750		
ERM 0.5-10%	10	12	9	7	2	10	0.84289	0.83315	0.97400		
ERM 0.5-20%	2	12	12	11	1	11	0.84181	0.82840	1.21909		
ERM 0.5-20%	3	12	11	9	2	10	0.83338	0.82581	0.75700		
ERM 0.5-20%	6	12	12	11	1	11	0.84744	0.83376	1.24364		
ERM 0.5-20%	10	12	11	8	3	9	0.84282	0.83290	1.10222		
ERM 0.5-40%	1	12	12	12	0	12	0.84155	0.82707	1.20667		
ERM 0.5-40%	6	12	11	10	1	11	0.84175	0.82764	1.28273		
ERM 0.5-40%	11	12	12	12	0	12	0.85456	0.83737	1.43250		
ERM 0.5-40%	12	12	12	10	2	10	0.84160	0.83013	1.14700		
ERM 0.5-60%	1	12	12	10	2	10	0.84911	0.83494	1.41700		
ERM 0.5-60%	2	12	11	11	0	12	0.84245	0.83007	1.03167		
ERM 0.5-60%	4	12	12	12	0	12	0.84464	0.83275	0.99083		
ERM 0.5-60%	8	12	11	10	1	11	0.83273	0.82454	0.74455		
ERM 0.5-80%	2	12	12	12	0	12	0.84814	0.83627	0.98917		
ERM 0.5-80%	6	12	12	11	1	11	0.84498	0.83272	1.11455		
ERM 0.5-80%	8	12	12	12	0	12	0.84981	0.83577	1.17000		
ERM 0.5-80%	12	12	11	11	0	12	0.84120	0.83145	0.81250		
ERM 0.5-100%	1	12	12	12	0	12	0.83592	0.82588	0.83667		
ERM 0.5-100%	2	12	12	12	0	12	0.83648	0.82706	0.78500		
ERM 0.5-100%	9	12	12	12	0	12	0.83151	0.82174	0.81417		
ERM 0.5-100%	12	12	9	7	2	10	0.82806	0.82242	0.56400		

As per Rick Sherrard at TVA the Biomass statistical analysis were analyzed with out the inclusion of pupae or midges.
Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 1.0 – 10%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840 thur 8/7/11
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: [illegible]

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass weight (mg)
Sample ID:	3	12	0.84966	0.83626	0.0134	10	1.34000	1.11667	0	1.11667
ERM 1.0	4	12	0.84613	0.83140	0.01473	12	1.22750	1.22750	0	1.22750
GLEC Number:	8	12	0.84125	0.82717	0.01408	10	1.40800	1.17333	1	1.28000
8984	9	12	0.84741	0.83213	0.01528	11	1.38909	1.27333	0	1.27333
10%	11	12	0.84891	0.83502	0.01389	12	1.15750	1.15750	0	1.15750
					DS		DS	DS		
						AVERAGE:	1.30442	1.18967		

* Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 1.0 - 20%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: MW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) *Biomass Weight (mg)
Sample ID:	2	12	0.83993	0.82802	0.01191	10	1.19100	0.99250	1	1.08273
ERM 1.0	3	12	0.84103	0.8245 AD 8/8/11	0.01653	12	1.37750	1.37750	0	1.37750
GLEC Number:	4	12	0.85821	0.84313	0.01508	11	1.37091	1.25667	1	1.37091
8984	11	12	0.84749	0.83353	0.01396	12	1.16333	1.16333	0	1.16333
20%					DS		DS	DS		
						AVERAGE:	1.27569	1.19750		

*Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms ~~minus pupae a~~ 9/21/11 MLL divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 1.0 – 40%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: MW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID:	2	12	0.84218	0.82854	0.01364	12	1.13667	1.13667	0	1.13667
ERM 1.0	3	12	0.84567	0.83118	0.01449	12	1.20750	1.20750	0	1.20750
GLEC Number:	9	12	0.85053	0.83681	0.01372	10	1.37200	1.14333	2	1.37200
8984	11	12	0.85690	0.84232	0.01458	12	1.21500	1.21500	0	1.21500
40 %					DS		DS	DS		
						AVERAGE:	1.23279	1.17563		

*Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 1.0 - 60%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 - 8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1160 - 1330

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID:	1	12	0.83618	0.82703	0.009145	7	1.30714	250 mw 8/8/11 0.76 ~~167~~	1	0.83182
ERM 1.0	5	12	0.86076	0.84608	mw 8/8/11 0.01468	12	1.22333	1.22333	0	1.22333
GLEC Number:	8	12	0.85123	0.83688 AD ~~0.84608~~ 8/8/11	0.01435	12	1.19583	1.19583	0	1.19583
8984 60%	10	12	0.84613	0.83317	0.01296	9	1.44000	1.08000	2	1.29600
					DS		DS	DS		
						AVERAGE:	1.29158	1.06542		

*Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 1.0 – 80%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 /8/8/11 AD

Technician's Initials: ~~8/5/11~~ KN 8/5/11 ~~KN~~/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by:

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID:	1	12	0.85500	0.84240	0.01260 6 DS 8/8/11	12	1.05000	1.05000
ERM 1.0	3	12	0.84443	0.83416	0.01027	12	0.85583	0.85583
GLEC Number:	7	12	0.84431	0.83294	0.01137	11	1.03364	0.94750
8984	8	12	0.85676	0.84249	0.01427	12	1.18917	1.18917
80 %								
						AVERAGE:	1.03215	1.01063

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 1.0 - 100%

Test Species: *C. dilutus* _____

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/4/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: hw

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID:	4	12	0.85280	0.84056 (AD 8/8/11)	0.01224	12	1.02000	1.02000
ERM 1.0	7	12	0.84528	0.83471	0.01057	12	0.88083	0.88083
GLEC Number:	8	12	0.85819	0.84604	0.01215	11	1.10455 (5 DS 8/9/11)	1.01250
8984	9	12	0.83866	0.83055	0.00811	9	0.90111	0.67583
100%					DS		DS	DS
						AVERAGE:	0.97662	0.89729

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 1.0 (GLC No. 8984)

Test Dates: July 15 - September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment
Test Species: *Chironomus dilutus*

Group	Replicate Number	Day 0 Number Organisms at Test Initiation	Day 20 Number of Organisms Surviving	Day 20 Number Organisms Weighed	Day 20 Number of Pupae and Midge	Number of Organisms at Test initiation Minus Day 20 pupae and Midge	Dry Weight mg pan/orgs after 24h	Weight of Ashed Pan/Orgs-mg	Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges		
ERM 1.0-10%	3	12	10	10	0	12	0.84966	0.83626	1.11667		
ERM 1.0-10%	4	12	12	12	0	12	0.84613	0.83140	1.22750		
ERM 1.0-10%	8	12	11	10	1	11	0.84125	0.82717	1.28000		
ERM 1.0-10%	9	12	11	11	0	12	0.84741	0.83213	1.27333		
ERM 1.0-10%	11	12	12	12	0	12	0.84891	0.83502	1.15750		
ERM 1.0-20%	2	12	11	10	1	11	0.83993	0.82802	1.08273		
ERM 1.0-20%	3	12	12	12	0	12	0.84103	0.82450	1.37750		
ERM 1.0-20%	4	12	12	11	1	11	0.85821	0.84313	1.37091		
ERM 1.0-20%	11	12	12	12	0	12	0.84749	0.83353	1.16333		
ERM 1.0-40%	2	12	12	12	0	12	0.84218	0.82854	1.13667		
ERM 1.0-40%	3	12	12	12	0	12	0.84567	0.83118	1.20750		
ERM 1.0-40%	9	12	12	10	2	10	0.85053	0.83681	1.37200		
ERM 1.0-40%	11	12	12	12	0	12	0.85690	0.84232	1.21500		
ERM 1.0-60%	1	12	8	7	1	11	0.83618	0.82703	0.83182		
ERM 1.0-60%	5	12	12	12	0	12	0.86076	0.84608	1.22333		
ERM 1.0-60%	8	12	12	12	0	12	0.85123	0.83688	1.19583		
ERM 1.0-60%	10	12	11	9	2	10	0.84613	0.83317	1.29600		
ERM 1.0-80%	1	12	12	12	0	12	0.85500	0.84240	1.05000		
ERM 1.0-80%	3	12	12	12	0	12	0.84443	0.83416	0.85583		
ERM 1.0-80%	7	12	11	11	0	12	0.84431	0.83294	0.94750		
ERM 1.0-80%	8	12	12	12	0	12	0.85676	0.84249	1.18917		
ERM 1.0-100%	4	12	12	12	0	12	0.85280	0.84056	1.02000		
ERM 1.0-100%	7	12	12	12	0	12	0.84528	0.83471	0.88083		
ERM 1.0-100%	8	12	11	11	0	12	0.85819	0.84604	1.01250		
ERM 1.0-100%	9	12	9	9	0	12	0.83866	0.83055	0.67583		

As per Rick Sherrard at TVA the Biomass statistical analysis were analyzed with out the inclusion of pupae or midges.
Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges

Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 2.5 – 10%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID: ERM 2.5	6	12	0.84870	0.83483	0.01387	10	1.38700	1.15583	1	1.26091
	9	12	0.84639	0.83136	0.01503	11	1.36636	1.25250	0	1.25250
GLEC Number: 8985	11	12	0.84005	0.83042	0.00963	8	1.20375	0.80250	3	1.07000
10 %	12	12	0.84496	0.83042	0.01454	10	1.45400	1.21167	1	1.32182
					nwv		nwv	nwv		
						AVERAGE:	1.35278	1.10563		

* Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 2.5 - 20%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 - 8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100 - 1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 2.5	2	12	0.84872	0.83474	0.01398	11	1.27091	1.16500
	3	12	0.85210	0.83931	0.01279	11	1.16273	1.06583
GLEC Number: 8985	10	12	0.84162	0.82953	0.01209	12	1.00750	1.00750
20%	12	12	0.85318	0.83941	0.01377 ~~0.01440~~ DS 8/8/11	12	1.14750 ~~1.20000~~ DS 8/8/11	1.14750 ~~1.20000~~ DS 8/8/11
					mw		mw	mw
						AVERAGE:	1.14716	1.09646

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 2.5 - 40%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 - 8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) *Biomass Weight (mg)
Sample ID: ERM 2.5	1	12	0.86067	0.84748	0.01319	12	1.09917	1.09917	0	1.09917
	5	12	0.84838	0.83653	0.01185	12	0.98750	0.98750	0	0.98750
GLEC Number:	6	12	0.84772	0.83703	0.01069	10	1.06900	0.89083	1	0.97182
8985 40%	12	12	0.84062	0.83075	0.00987	9	1.09667	0.82250	1	0.89727
					nw		nw	nw		
						AVERAGE:	1.06309	0.95000		

* Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 2.5 - 60%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100 - 1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID:	1	12	0.84984	0.83995	0.00989 ~~0.98~~ 8/8/11	12	0.82417	0.82417
ERM 2.5	7	12	0.84225	0.83370	0.00855	11	0.77727	0.71250
GLEC Number:	9	12	0.83459	0.82597	0.00862	12	0.71833	0.71833
8985	12	12	0.84454	0.83546	0.00908	11	0.82546 5 DS 8/15/11	0.75667
60%					new		new	new
						AVERAGE:	0.78631	0.75292

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 2.5 - 80%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnace

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID:	KN 8/5/11 ~~9~~ 1	12	0.83468	0.82777	0.00691	9	0.76778	0.57583
ERM 2.5	5	12	0.83802	0.83098	0.00704	10	0.70400	0.58667
GLEC Number:	6	12	0.83038	0.82328	0.00710	12	0.59167	0.59167
8985	7	12	0.81938	0.81346	0.00592	10	0.59200	0.49333
80%					mw		mw	mw
						AVERAGE:	0.66386	0.56188

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 2.5 - 100%

Test Species: *C. dilutus* _____

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID: ERM 2.5	5	12	0.83360	0.82816	0.00544	8	0.68000	0.45333	0	0.45333
	7	12	0.83284	0.82825	0.00459	5	0.91800	0.38250	0	0.38250
GLEC Number: 8985	9	12	0.82944	0.82559	0.00385	4	0.96250	0.32083	1	0.35000
100 %	12	12	0.82899	0.82296	0.00603	6	1.00500	0.50250	0	0.50250
					new		new	new		
						AVERAGE:	0.89138	~~0.44~~ 0.41479 8/8/11		

* Biomass Weight (mg) - defined as the total Ash-Free - Dry Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 2.5 (GLC No. 8985)

Test Dates: July 15 - September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment
Test Species: *Chironomus dilutus*

Group	Replicate Number	Day 0 Number Organisms at Test Initiation	Day 20 Number of Organisms Surviving	Day 20 Number Organisms Weighed	Day 20 Number of Pupae and Midge	Number of Organisms at Test initiation Minus Day 20 pupae and Midge	Dry Weight mg pan/orgs after 24h	Weight of Ashed Pan/Orgs-mg	Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges		
ERM 2.5-10%	6	12	11	10	1	11	0.84870	0.83483	1.26091		
ERM 2.5-10%	9	12	11	11	0	12	0.84639	0.83136	1.25250		
ERM 2.5-10%	11	12	11	8	3	9	0.84005	0.83042	1.07000		
ERM 2.5-10%	12	12	11	10	1	11	0.84496	0.83042	1.32182		
ERM 2.5-20%	2	12	11	11	0	12	0.84872	0.83474	1.16500		
ERM 2.5-20%	3	12	11	11	0	12	0.85210	0.83931	1.06583		
ERM 2.5-20%	10	12	12	12	0	12	0.84162	0.82953	1.00750		
ERM 2.5-20%	12	12	12	12	0	12	0.85318	0.83941	1.14750		
ERM 2.5-40%	1	12	12	12	0	12	0.86067	0.84748	1.09917		
ERM 2.5-40%	5	12	12	12	0	12	0.84838	0.83653	0.98750		
ERM 2.5-40%	6	12	11	10	1	11	0.84772	0.83703	0.97182		
ERM 2.5-40%	12	12	10	9	1	11	0.84062	0.83075	0.89727		
ERM 2.5-60%	1	12	12	12	0	12	0.84984	0.83995	0.82417		
ERM 2.5-60%	7	12	11	11	0	12	0.84225	0.83370	0.71250		
ERM 2.5-60%	9	12	12	12	0	12	0.83459	0.82597	0.71833		
ERM 2.5-60%	12	12	11	11	0	12	0.84454	0.83546	0.75667		
ERM 2.5-80%	1	12	9	9	0	12	0.83468	0.82777	0.57583		
ERM 2.5-80%	5	12	10	10	0	12	0.83802	0.83098	0.58667		
ERM 2.5-80%	6	12	12	12	0	12	0.83038	0.82328	0.59167		
ERM 2.5-80%	7	12	10	10	0	12	0.81938	0.81346	0.49333		
ERM 2.5-100%	5	12	8	8	0	12	0.83360	0.82816	0.45333		
ERM 2.5-100%	7	12	5	5	0	12	0.83284	0.82825	0.38250		
ERM 2.5-100%	9	12	5	4	1	11	0.82944	0.82559	0.35000		
ERM 2.5-100%	12	12	6	6	0	12	0.82899	0.82296	0.50250		

As per Rick Sherrard at TVA the Biomass statistical analysis were analyzed with out the inclusion of pupae or midges.
Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 3.5 - 10%

Test Species: *C. dilutus* _____

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 1100-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) *Biomass Weight (mg)
Sample ID:	1	12	0.84108	0.82712	0.01396	7	1.99429	1.16333	1	1.26909
ERM 3.5	6	12	0.83721	0.82684	0.01037	7	1.48143	0.86417	2	1.03700
GLEC Number:	7	12	0.84836	0.83267	0.01569	12	1.30750	1.30750	0	1.30750
8987	9	12	0.84286	0.82958	0.01328	11	1.20727	1.10667	1	1.20727
10 %					nuc		nuc	nuc		
							~~1.49762~~ nuc 8/8/11	~~1.11042~~ 8/8/11 nuc		
						AVERAGE:	1.49762	1.11042		

*Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 3.5 - 20%

Test Species: *C. dilutus* _____

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 11-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20	(B-C)/(A-E) *Biomass Weight (mg)
Sample ID:	1	12	0.84540	0.83313	0.01227	12	1.02250	1.02250	0	1.02250
ERM 3.5	4	12	0.84216	0.82992	0.01224	11	1.11273	1.02000	1	1.11273
GLEC Number:	5	12	0.83712	0.82650	0.01062	11	0.96545 5/8/11	0.88500	0	0.88500
8987	7	12	0.84432	0.82970	0.01462	11	1.32909	1.21833	1	1.32909
20%					mw		mw	mw		
							~~1.34881~~ mw 8/8/11	~~1.14583~~ mw 8/8/11		
						AVERAGE:	1.10745	1.03646		

*Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 3.5 – 40%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625 - 1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 11-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)	E Number of pupae and midges at Day 20.	(B-C)/(A-E) * Biomass Weight (mg)
Sample ID:	3	12	0.85264	0.83858	0.01406	12	1.17167	1.17167	0	1.17167
ERM 3.5	5	12	0.84611	0.83521	0.01090	12	0.90833	0.90833	0	0.90833
GLEC Number:	7	12	0.85160	0.83890	0.01270	11	1.15455	1.05833	1	1.15455
8987	8	12	0.83946	0.82441	0.01505	12	1.25417	1.25417	0	1.25417
40 %					mw		mw	mw		
							~~1.12218~~ mw 8/8/11	~~1.09813~~ 8/8/11 mw		
						AVERAGE:	1.12218	1.09813		

* Biomass weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges - as per Rick Sherrard

Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 3.5 -60%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN / AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1210

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 11-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID:	4	12	0.82419	0.81410	0.01009	12	0.84083	0.84083
ERM 3.5	7	12	0.82870	0.81924	0.00946	11	0.86000	0.78833
GLEC Number:	10	12	0.82740	0.81818	~~0.09228~~ 0.009 AD 8/8/11	10	0.92200	0.76833
8987	11	12	0.85211	0.83971	0.01240	10	1.24000	1.03333
60%								
							AD 8/8/11 ~~0.96570~~	
						AVERAGE:	0.96570 1	~~2.65582~~

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

DS 9/26/11

DS 9/26/11 0.85771

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 3.5 - 80%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 840
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 11-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 3.5	5	12	0.82946	0.82225	0.00721	10	0.72100	0.60083
	8	12	0.82531	0.81836	0.00695	10	0.69500	0.57917
GLEC Number: 8987	10	12	0.81820	0.81199	0.00621	10	0.62100	0.51750
80%	11	12	0.84006	0.83004	0.01002	10	1.00200	0.83500
					mw		mw	mw
						AVERAGE:	0.75975	0.63313

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

GLEC
Great Lakes Environmental Center

TVA Emory

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ERM 3.5 – 100%

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle Furnance

Project Name: 5069-03

Weigh Date: 8/5/11 / 8/8/11 AD

Technician's Initials: KN/AD

Test Date: 7/15/2011 -8/4/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/4/2011 1530
Date/Time out: 8/5/2011 1530

Dessicator
Date/Time in: 8/5/2011 1530
Date/Time out: 8/5/11 1625-1730

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 8/7/11 1240
Date/Time out: 8/7/11 1240

Dessicator
Date/Time in: 8/7/11 1800
Date/Time out: 8/8/11 11-1330

QC'd by: DS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C AD Ashed Weight of Pan and Organisms (g)	B-C Total Ash-Free Dry Weight (g)	D Number of Organisms Weighed	B-C/D Average Ash-Free Dry Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 3.5	1	12	0.83131	0.82390	0.00741	10	0.74100	0.61750
	4	12	0.82164	0.81551	0.00613	11	0.55727	0.51083
GLEC Number: 8987 100%	8	12	0.83329	0.82551	0.00778	11	0.70727	0.64833
	9	12	0.82572	0.81763	0.00809	12	0.67417	0.67417
						AVERAGE:	0.66993	0.61271

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: ERM 3.5 (GLC No. 8987)

Test Dates: July 15 - September 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment
Test Species: *Chironomus dilutus*

Group	Replicate Number	Day 0 Number Organisms at Test Initiation	Day 20 Number of Organisms Surviving	Day 20 Number Organisms Weighed	Day 20 Number of Pupae and Midge	Number of Organisms at Test initiation Minus Day 20 pupae and Midge	Dry Weight mg pan/orgs after 24h	Weight of Ashed Pan/Orgs-mg	Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges		
ERM 3.5-10%	1	12	8	7	1	11	0.84108	0.82712	1.26909		
ERM 3.5-10%	6	12	9	7	2	10	0.83721	0.82684	1.03700		
ERM 3.5-10%	7	12	12	12	0	12	0.84836	0.83267	1.30750		
ERM 3.5-10%	9	12	12	11	1	11	0.84286	0.82958	1.20727		
ERM 3.5-20%	1	12	12	12	0	12	0.84540	0.83313	1.02250		
ERM 3.5-20%	4	12	12	11	1	11	0.84216	0.82992	1.11273		
ERM 3.5-20%	5	12	11	11	0	12	0.83712	0.82650	0.88500		
ERM 3.5-20%	7	12	12	11	1	11	0.84432	0.82970	1.32909		
ERM 3.5-40%	3	12	12	12	0	12	0.85264	0.83858	1.17167		
ERM 3.5-40%	5	12	12	12	0	12	0.84611	0.83521	0.90833		
ERM 3.5-40%	7	12	12	11	1	11	0.85160	0.83890	1.15455		
ERM 3.5-40%	8	12	12	12	0	12	0.83946	0.82441	1.25417		
ERM 3.5-60%	4	12	12	12	0	12	0.82419	0.81410	0.84083		
ERM 3.5-60%	7	12	11	11	0	12	0.82870	0.81924	0.78833		
ERM 3.5-60%	10	12	10	10	0	12	0.82740	0.81818	0.76833		
ERM 3.5-60%	11	12	10	10	0	12	0.85211	0.83971	1.03333		
ERM 3.5-80%	5	12	10	10	0	12	0.82946	0.82225	0.60083		
ERM 3.5-80%	8	12	10	10	0	12	0.82531	0.81836	0.57917		
ERM 3.5-80%	10	12	10	10	0	12	0.81820	0.81199	0.51750		
ERM 3.5-80%	11	12	10	10	0	12	0.84006	0.83004	0.83500		
ERM 3.5-100%	1	12	10	10	0	12	0.83131	0.82390	0.61750		
ERM 3.5-100%	4	12	11	11	0	12	0.82164	0.81551	0.51083		
ERM 3.5-100%	8	12	11	11	0	12	0.83329	0.82551	0.64833		
ERM 3.5-100%	9	12	12	12	0	12	0.82572	0.81763	0.67417		

As per Rick Sherrard at TVA the Biomass statistical analysis were analyzed with out the inclusion of pupae or midges.
Biomass (mg)-defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms minus pupae and midges

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	7/15/2011	Test ID:	concd20	Sample ID:	LCS
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-%	1	2	3	4
GLW Only	1.0000	0.7500	1.0000	1.0000
LCS + GLW	1.0000	0.9167	0.9167	1.0000
LCS + ERW	1.0000	0.9167	1.0000	0.9167

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW Only	0.9375	0.9783	1.3313	1.0472	1.4260	14.225	4			
LCS + GLW	0.9583	1.0000	1.3520	1.2780	1.4260	6.320	4	*		
LCS + ERW	0.9583	1.0000	1.3520	1.2780	1.4260	6.320	4	0.000	1.943	0.1174

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.66355	0.818	-4E-17	-2.8
F-Test indicates equal variances (p = 1.00)	1	15.4392		
The control means are not significantly different (p = 0.85)	0.19916	2.44691		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.06173	0.06479	0	0.0073	1	1, 6

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	7/15/2011	Test ID:	concd20	Sample ID:	LCS
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-%	1	2	3	4
GLW Only	0.7383	1.0733	0.6217	0.7758
LCS + GLW	1.0808	1.2518	1.2591	1.0008
LCS + ERW	1.5233	1.2582	1.0100	1.2173

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW Only	0.8023	0.6988	0.8023	0.6217	1.0733	23.963	4			
LCS + GLW	1.1481	1.0000	1.1481	1.0008	1.2591	11.164	4	*		
LCS + ERW	1.2522	1.0906	1.2522	1.0100	1.5233	16.842	4	-0.843	1.943	0.2398

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98612	0.818	0.21054	-0.0666
F-Test indicates equal variances (p = 0.44)	2.70711	15.4392		
The control means are significantly different (p = 0.02)	2.99359	2.44691		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.23978	0.20884	0.02165	0.03045	0.43142	1, 6

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	7/15/2011	Test ID:	concd20	Sample ID:	LCS
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-%	1	2	3	4
GLW Only	0.7383	0.8050	0.6217	0.7758
LCS + GLW	1.0808	1.1475	1.1542	1.0008
LCS + ERW	1.5233	1.1533	1.0100	1.1158

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW Only	0.7352	0.6709	0.7352	0.6217	0.8050	10.944	4			
LCS + GLW	1.0958	1.0000	1.0958	1.0008	1.1542	6.522	4	*		
LCS + ERW	1.2006	1.0956	1.2006	1.0100	1.5233	18.618	4	-0.893	1.943	0.2280

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.89608	0.818	1.33626	2.68317
F-Test indicates equal variances (p = 0.09)	9.78348	15.4392		
The control means are significantly different (p = 5.36E-04)	6.70194	2.44691		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.22801	0.20807	0.02196	0.02754	0.40622	1, 6

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	7/15/2011	Test ID:	erm0.5cd20	Sample ID:	ERM 0.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.0000	0.9167	1.0000	0.9167
ERS + ERW	0.9167	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	0.7500
20	1.0000	0.9167	1.0000	0.9167
40	1.0000	0.9167	1.0000	1.0000
60	1.0000	0.9167	1.0000	0.9167
80	1.0000	1.0000	1.0000	0.9167
100	1.0000	1.0000	1.0000	0.7500

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4				
ERS + ERW	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	*		0.9792	1.0000
10	0.9375	0.9574	1.3313	1.0472	1.4260	14.225	4	17.50	10.00	0.9625	0.9830
20	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4	16.00	10.00	0.9625	0.9830
40	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	18.00	10.00	0.9625	0.9830
60	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4	16.00	10.00	0.9625	0.9830
80	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	18.00	10.00	0.9625	0.9830
100	0.9375	0.9574	1.3313	1.0472	1.4260	14.225	4	17.50	10.00	0.9375	0.9574

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.78838	0.896	-1.4515	1.68146
Bartlett's Test indicates equal variances (p = 0.34)	6.8376	12.5916		
The control means are not significantly different (p = 0.54)	0.65465	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	7/15/2011	Test ID:	erm0.5cd20	Sample ID:	ERM 0.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.5233	1.2582	1.0100	1.2173
ERS + ERW	1.3264	1.2642	1.3517	1.4108
10	1.2308	1.2809	1.4475	1.3914
20	1.2191	0.8411	1.2436	1.2400
40	1.2067	1.4110	1.4325	1.1470
60	1.4170	1.1255	0.9908	0.8190
80	0.9892	1.1145	1.1700	0.8864
100	0.8367	0.7850	0.8142	0.8057

			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	1.2522	0.9357	1.2522	1.0100	1.5233	16.842	4				
ERS + ERW	1.3383	1.0000	1.3383	1.2642	1.4108	4.541	4	*		1.3383	1.0000
10	1.3377	0.9996	1.3377	1.2308	1.4475	7.424	4	18.00	10.00	1.3377	0.9996
*20	1.1360	0.8488	1.1360	0.8411	1.2436	17.330	4	10.00	10.00	1.2176	0.9099
40	1.2993	0.9709	1.2993	1.1470	1.4325	11.064	4	18.00	10.00	1.2176	0.9099
60	1.0881	0.8131	1.0881	0.8190	1.4170	23.217	4	14.00	10.00	1.0881	0.8131
*80	1.0400	0.7771	1.0400	0.8864	1.1700	12.244	4	10.00	10.00	1.0400	0.7771
*100	0.8104	0.6056	0.8104	0.7850	0.8367	2.638	4	10.00	10.00	0.8104	0.6056

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96507	0.896	-0.1631	0.96566
Bartlett's Test indicates unequal variances (p = 0.03)	13.7703	12.5916		
The control means are not significantly different (p = 0.46)	0.78424	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	60	80	69.282	1.66667
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	15.525	9.940	1.900	59.307	2.3880
IC10	42.037	15.993	0.000	77.593	0.1817
IC15	52.367	13.189	0.000	89.782	-0.6300
IC20	67.269	11.781	36.892	92.871	0.0513
IC25	83.164	10.641	37.025	90.222	-1.0191
IC40	>100				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	7/15/2011	Test ID:	erm0.5cd20	Sample ID:	ERM 0.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.5233	1.1533	1.0100	1.1158
ERS + ERW	1.2158	1.2642	1.3517	1.4108
10	1.2308	1.2809	1.4475	0.9740
20	1.2191	0.7570	1.2436	1.1022
40	1.2067	1.2827	1.4325	1.1470
60	1.4170	1.0317	0.9908	0.7445
80	0.9892	1.1145	1.1700	0.8125
100	0.8367	0.7850	0.8142	0.5640

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	1.2006	0.9161	1.2006	1.0100	1.5233	18.618	4					
ERS + ERW	1.3106	1.0000	1.3106	1.2158	1.4108	6.662	4	*			1.3106	1.0000
10	1.2333	0.9410	1.2333	0.9740	1.4475	15.902	4	0.603	2.451	0.3141	1.2333	0.9410
20	1.0805	0.8244	1.0805	0.7570	1.2436	20.760	4	1.796	2.451	0.3141	1.1739	0.8956
40	1.2672	0.9669	1.2672	1.1470	1.4325	9.737	4	0.339	2.451	0.3141	1.1739	0.8956
60	1.0460	0.7981	1.0460	0.7445	1.4170	26.572	4	2.065	2.451	0.3141	1.0460	0.7981
80	1.0216	0.7794	1.0216	0.8125	1.1700	15.523	4	2.256	2.451	0.3141	1.0216	0.7794
*100	0.7500	0.5722	0.7500	0.5640	0.8367	16.769	4	4.376	2.451	0.3141	0.7500	0.5722

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97528	0.896	-0.1831	0.23711
Bartlett's Test indicates equal variances (p = 0.58)	4.75266	12.5916		
The control means are not significantly different (p = 0.39)	0.91673	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	80	100	89.4427	1.25	0.3141	0.23966	0.14804	0.03283	0.00438	6, 21
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	8.476	13.934	0.000	75.162	1.7332
IC10	19.040	19.756	0.000	95.406	0.4421
IC15	49.359	20.174	0.000	100.575	-0.4143
IC20	59.611	16.109	0.000	100.376	-0.6727
IC25	82.841	12.192	32.313	93.650	-1.1767
IC40	97.318				
IC50	>100				

* indicates IC estimate less than the lowest concentration

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	7/15/2011	Test ID:	erm1.0cd20	Sample ID:	ERM 1.0
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5
LCS + ERW	1.0000	0.9167	1.0000	0.9167	
ERS + ERW	0.9167	1.0000	1.0000	1.0000	
10	0.8333	1.0000	0.9167	0.9167	1.0000
20	0.9167	1.0000	1.0000	1.0000	
40	1.0000	1.0000	1.0000	1.0000	
60	0.6667	1.0000	1.0000	0.9167	
80	1.0000	1.0000	0.9167	1.0000	
100	1.0000	1.0000	0.9167	0.7500	

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4					
ERS + ERW	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	*			0.9792	1.0000
10	0.9333	0.9532	1.3116	1.1503	1.4260	8.895	5	0.917	2.591	0.2184	0.9708	0.9915
20	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	0.000	2.591	0.2303	0.9708	0.9915
40	1.0000	1.0213	1.4260	1.4260	1.4260	0.000	4	-0.416	2.591	0.2303	0.9708	0.9915
60	0.8958	0.9149	1.2713	0.9553	1.4260	17.455	4	1.324	2.591	0.2303	0.9375	0.9574
80	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	0.000	2.591	0.2303	0.9375	0.9574
100	0.9167	0.9362	1.2943	1.0472	1.4260	13.821	4	1.066	2.591	0.2303	0.9167	0.9362

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.89464	0.898	-1.099	1.51747
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.54)	0.65465	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	100	>100		1	0.12773	0.13205	0.0143	0.01579	0.50893	6, 22
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	87.000			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	7/15/2011	Test ID:	erm1.0cd20	Sample ID:	ERM 1.0
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5
LCS + ERW	1.5233	1.2582	1.0100	1.2173	
ERS + ERW	1.3264	1.2642	1.3517	1.4108	
10	1.3400	1.2275	1.4080	1.3891	1.1575
20	1.1910	1.3775	1.3709	1.1633	
40	1.1367	1.2075	1.3720	1.2150	
60	1.3071	1.2233	1.1958	1.4400	
80	1.0500	0.8558	1.0336	1.1892	
100	1.0200	0.8808	1.1045	0.9011	

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	1.2522	0.9357	1.2522	1.0100	1.5233	16.842	4					
ERS + ERW	1.3383	1.0000	1.3383	1.2642	1.4108	4.541	4	*			1.3383	1.0000
10	1.3044	0.9747	1.3044	1.1575	1.4080	8.280	5	0.471	2.591	0.1860	1.3044	0.9747
20	1.2757	0.9532	1.2757	1.1633	1.3775	8.964	4	0.827	2.591	0.1960	1.2757	0.9532
40	1.2328	0.9212	1.2328	1.1367	1.3720	8.054	4	1.394	2.591	0.1960	1.2622	0.9432
60	1.2916	0.9651	1.2916	1.1958	1.4400	8.493	4	0.617	2.591	0.1960	1.2622	0.9432
*80	1.0322	0.7713	1.0322	0.8558	1.1892	13.244	4	4.046	2.591	0.1960	1.0322	0.7713
*100	0.9766	0.7298	0.9766	0.8808	1.1045	10.759	4	4.780	2.591	0.1960	0.9766	0.7298

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9533	0.898	0.0509	-1.0838
Bartlett's Test indicates equal variances (p = 0.95)	1.65277	12.5916		
The control means are not significantly different (p = 0.46)	0.78424	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	60	80	69.282	1.66667	0.19603	0.14648	0.08345	0.01145	2.2E-04	6, 22
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	26.430	21.646	0.000	82.523	0.2638
IC10	65.021	11.630	0.000	75.825	-2.3832
IC15	70.839	4.493	61.560	87.588	0.8682
IC20	76.657				
IC25	90.251				
IC40	>100				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	7/15/2011	Test ID:	erm1.0cd20	Sample ID:	ERM 1.0
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5
LCS + ERW	1.5233	1.1533	1.0100	1.1158	
ERS + ERW	1.2158	1.2642	1.3517	1.4108	
10	1.1167	1.2275	1.2800	1.2733	1.1575
20	1.0827	1.3775	1.3709	1.1633	
40	1.1367	1.2075	1.3720	1.2150	
60	0.8318	1.2233	1.1958	1.2960	
80	1.0500	0.8558	0.9475	1.1892	
100	1.0200	0.8808	1.0125	0.6758	

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	1.2006	0.9161	1.2006	1.0100	1.5233	18.618	4					
ERS + ERW	1.3106	1.0000	1.3106	1.2158	1.4108	6.662	4	*			1.3106	1.0000
10	1.2110	0.9240	1.2110	1.1167	1.2800	5.937	5	1.091	2.591	0.2367	1.2308	0.9391
20	1.2486	0.9527	1.2486	1.0827	1.3775	11.911	4	0.644	2.591	0.2495	1.2308	0.9391
40	1.2328	0.9406	1.2328	1.1367	1.3720	8.054	4	0.808	2.591	0.2495	1.2308	0.9391
60	1.1367	0.8673	1.1367	0.8318	1.2960	18.265	4	1.806	2.591	0.2495	1.1367	0.8673
*80	1.0106	0.7711	1.0106	0.8558	1.1892	14.153	4	3.116	2.591	0.2495	1.0106	0.7711
*100	0.8973	0.6846	0.8973	0.6758	1.0200	17.929	4	4.293	2.591	0.2495	0.8973	0.6846

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9544	0.898	-0.6301	-0.0417
Bartlett's Test indicates equal variances (p = 0.58)	4.7302	12.5916		
The control means are not significantly different (p = 0.39)	0.91673	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	60	80	69.282	1.66667	0.24947	0.19034	0.08698	0.01854	0.00324	6, 22
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	8.210	18.746	2.422	88.455	0.7535
IC10	50.896	17.523	0.000	76.676	-1.0052
IC15	63.602	10.150	34.198	90.776	-0.7186
IC20	73.994				
IC25	84.881				
IC40	>100				
IC50	>100				

* indicates IC estimate less than the lowest concentration

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	7/15/2011	Test ID:	erm2.5cd20	Sample ID:	ERM 2.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-%	1	2	3	4
LCS + ERW	1.0000	0.9167	1.0000	0.9167
ERS + ERW	0.9167	1.0000	1.0000	1.0000
10	0.9167	0.9167	0.9167	0.9167
20	0.9167	0.9167	1.0000	1.0000
40	1.0000	1.0000	0.9167	0.8333
60	1.0000	0.9167	1.0000	0.9167
80	0.7500	0.8333	1.0000	0.8333
100	0.6667	0.4167	0.4167	0.5000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4				
ERS + ERW	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	*		0.9792	1.0000
10	0.9167	0.9362	1.2780	1.2780	1.2780	0.000	4	12.00	10.00	0.9427	0.9628
20	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4	16.00	10.00	0.9427	0.9628
40	0.9375	0.9574	1.3200	1.1503	1.4260	10.072	4	15.50	10.00	0.9427	0.9628
60	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4	16.00	10.00	0.9427	0.9628
80	0.8542	0.8723	1.1934	1.0472	1.4260	13.613	4	12.50	10.00	0.8542	0.8723
*100	0.5000	0.5106	0.7860	0.7017	0.9553	15.212	4	10.00	10.00	0.5000	0.5106

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97104	0.896	0.44766	0.16378
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.54)	0.65465	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	80	100	89.4427	1.25
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	62.824	25.503	0.000	90.840	-0.7168
IC10	73.882	5.740	58.071	88.293	0.1428
IC15	81.235	3.598	65.474	88.134	-0.7311
IC20	84.000	2.405	75.462	90.759	-0.2623
IC25	86.765	2.262	80.248	93.441	0.1989
IC40	95.059				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	7/15/2011	Test ID:	erm2.5cd20	Sample ID:	ERM 2.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.5233	1.2582	1.0100	1.2173
ERS + ERW	1.3264	1.2642	1.3517	1.4108
10	1.3870	1.3664	1.2037	1.4540
20	1.2709	1.1627	1.0075	1.1475
40	1.0992	0.9875	1.0690	1.0967
60	0.8242	0.7773	0.7183	0.8255
80	0.7678	0.7040	0.5917	0.5920
100	0.6800	0.9180	0.9625	1.0050

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	1.2522	0.9357	1.2522	1.0100	1.5233	16.842	4					
ERS + ERW	1.3383	1.0000	1.3383	1.2642	1.4108	4.541	4	*			1.3455	1.0000
10	1.3528	1.0109	1.3528	1.2037	1.4540	7.848	4	-0.253	2.410	0.1383	1.3455	1.0000
*20	1.1472	0.8572	1.1472	1.0075	1.2709	9.424	4	3.330	2.410	0.1383	1.1472	0.8526
*40	1.0631	0.7944	1.0631	0.9875	1.0992	4.911	4	4.795	2.410	0.1383	1.0631	0.7901
*60	0.7863	0.5876	0.7863	0.7183	0.8255	6.430	4	9.617	2.410	0.1383	0.7863	0.5844
*80	0.6639	0.4961	0.6639	0.5917	0.7678	13.128	4	11.751	2.410	0.1383	0.7776	0.5779
100	0.8914	0.6661	0.8914	0.6800	1.0050	16.303	4				0.7776	0.5779

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94688	0.884	-0.4083	-0.2339
Bartlett's Test indicates equal variances (p = 0.69)	3.06902	11.0705		
The control means are not significantly different (p = 0.46)	0.78424	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	10	20	14.1421	10	0.13832	0.10336	0.32206	0.00659	7.5E-10	5, 18
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	13.392	1.897	2.948	18.175	-1.3603
IC10	16.783	2.573	10.914	27.968	1.1023
IC15	20.825	4.967	13.624	39.719	0.8968
IC20	36.829	7.008	8.396	45.425	-0.8171
IC25	43.898	2.181	35.077	49.103	-1.0775
IC40	58.482				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	7/15/2011	Test ID:	erm2.5cd20	Sample ID:	ERM 2.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.5233	1.1533	1.0100	1.1158
ERS + ERW	1.2158	1.2642	1.3517	1.4108
10	1.2609	1.2525	1.0700	1.3218
20	1.1650	1.0658	1.0075	1.1475
40	1.0992	0.9875	0.9718	0.8973
60	0.8242	0.7125	0.7183	0.7567
80	0.5758	0.5867	0.5917	0.4933
100	0.4533	0.3825	0.3500	0.5025

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	1.2006	0.9161	1.2006	1.0100	1.5233	18.618	4					
ERS + ERW	1.3106	1.0000	1.3106	1.2158	1.4108	6.662	4	*			1.3106	1.0000
10	1.2263	0.9357	1.2263	1.0700	1.3218	8.863	4	1.528	2.410	0.1330	1.2263	0.9357
*20	1.0965	0.8366	1.0965	1.0075	1.1650	6.693	4	3.881	2.410	0.1330	1.0965	0.8366
*40	0.9889	0.7546	0.9889	0.8973	1.0992	8.430	4	5.829	2.410	0.1330	0.9889	0.7546
*60	0.7529	0.5745	0.7529	0.7125	0.8242	6.824	4	10.107	2.410	0.1330	0.7529	0.5745
*80	0.5619	0.4287	0.5619	0.4933	0.5917	8.217	4	13.569	2.410	0.1330	0.5619	0.4287
100	0.4221	0.3220	0.4221	0.3500	0.5025	16.304	4				0.4221	0.3220

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97414	0.884	-0.3606	-0.3656
Bartlett's Test indicates equal variances (p = 0.76)	2.62884	11.0705		
The control means are not significantly different (p = 0.39)	0.91673	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	10	20	14.1421	10	0.13299	0.10147	0.32758	0.00609	3.4E-10	5, 18
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	7.772	3.504	0.195	18.317	0.0908
IC10	13.600	3.825	1.556	24.774	-0.0329
IC15	18.647	5.088	3.387	37.673	0.4699
IC20	28.921	6.857	10.883	49.589	0.0878
IC25	40.506	4.939	22.015	49.586	-0.8896
IC40	57.165	2.638	49.255	65.967	0.1000
IC50	70.218	2.566	61.593	77.487	-0.0537

* indicates IC estimate less than the lowest concentration

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	7/15/2011	Test ID:	erm3.5cd20	Sample ID:	ERM 3.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.0000	0.9167	1.0000	0.9167
ERS + ERW	0.9167	1.0000	1.0000	1.0000
10	0.6667	0.7500	1.0000	1.0000
20	1.0000	1.0000	0.9167	1.0000
40	1.0000	1.0000	1.0000	1.0000
60	1.0000	0.9167	0.8333	0.8333
80	0.8333	0.8333	0.8333	0.8333
100	0.8333	0.9167	0.9167	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.9583	0.9787	1.3520	1.2780	1.4260	6.320	4				
ERS + ERW	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	*		0.9792	1.0000
10	0.8542	0.8723	1.2136	0.9553	1.4260	20.439	4	15.00	10.00	0.9444	0.9645
20	0.9792	1.0000	1.3890	1.2780	1.4260	5.328	4	18.00	10.00	0.9444	0.9645
40	1.0000	1.0213	1.4260	1.4260	1.4260	0.000	4	20.00	10.00	0.9444	0.9645
60	0.8958	0.9149	1.2511	1.1503	1.4260	10.486	4	13.00	10.00	0.8958	0.9149
*80	0.8333	0.8511	1.1503	1.1503	1.1503	0.000	4	10.00	10.00	0.8750	0.8936
100	0.9167	0.9362	1.2830	1.1503	1.4260	8.784	4	13.50	10.00	0.8750	0.8936

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91701	0.896	-0.0404	0.73492
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.54)	0.65465	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	45.857	22.160	0.000	85.029	-0.3278
IC10	74.000				
IC15	>100				
IC20	>100				
IC25	>100				
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	7/15/2011	Test ID:	erm3.5cd20	Sample ID:	ERM 3.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.5233	1.2582	1.0100	1.2173
ERS + ERW	1.3264	1.2642	1.3517	1.4108
10	1.9943	1.4814	1.3075	1.2073
20	1.0225	1.1127	0.9655	1.3291
40	1.1717	0.9083	1.1545	1.2542
60	0.8408	0.8600	0.9220	1.2400
80	0.7210	0.6950	0.6210	1.0020
100	0.7410	0.5573	0.7073	0.6742

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	1.2522	0.9357	1.2522	1.0100	1.5233	16.842	4					
ERS + ERW	1.3383	1.0000	1.3383	1.2642	1.4108	4.541	4	*			1.4179	1.0000
10	1.4976	1.1191	1.4976	1.2073	1.9943	23.367	4	-1.210	2.451	0.3228	1.4179	1.0000
20	1.1074	0.8275	1.1074	0.9655	1.3291	14.422	4	1.753	2.451	0.3228	1.1148	0.7862
40	1.1222	0.8385	1.1222	0.9083	1.2542	13.282	4	1.641	2.451	0.3228	1.1148	0.7862
*60	0.9657	0.7216	0.9657	0.8408	1.2400	19.272	4	2.829	2.451	0.3228	0.9657	0.6811
*80	0.7598	0.5677	0.7598	0.6210	1.0020	21.976	4	4.393	2.451	0.3228	0.7598	0.5358
*100	0.6699	0.5006	0.6699	0.5573	0.7410	11.928	4	5.075	2.451	0.3228	0.6699	0.4725

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93789	0.896	1.06993	2.01753
Bartlett's Test indicates equal variances (p = 0.14)	9.69756	12.5916		
The control means are not significantly different (p = 0.46)	0.78424	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	40	60	48.9898	2.5	0.32282	0.24123	0.35068	0.03468	2.7E-05	6, 21
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	12.339	1.226	7.446	15.550	-1.8973
IC10	14.678	2.910	12.077	21.101	6.5096
IC15	17.017	7.747	13.760	59.717	2.3562
IC20	19.355	13.317	15.014	74.763	0.5699
IC25	46.889	14.570	1.151	73.446	-0.5681
IC40	71.162	7.816	46.051	96.502	0.0915
IC50	91.307				

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	7/15/2011	Test ID:	erm3.5cd20	Sample ID:	ERM 3.5
End Date:	8/4/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile Sediment; LCS=Lab Control Sediment; ERS=Emory Ref Sed; ERW=Emory River Water

Conc-%	1	2	3	4
LCS + ERW	1.5233	1.1533	1.0100	1.1158
ERS + ERW	1.2158	1.2642	1.3517	1.4108
10	1.2691	1.0370	1.3075	1.2073
20	1.0225	1.1127	0.8850	1.3291
40	1.1717	0.9083	1.1545	1.2542
60	0.8408	0.7883	0.7683	1.0333
80	0.6008	0.5792	0.5175	0.8350
100	0.6175	0.5108	0.6483	0.6742

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	1.2006	0.9161	1.2006	1.0100	1.5233	18.618	4					
ERS + ERW	1.3106	1.0000	1.3106	1.2158	1.4108	6.662	4	*			1.3106	1.0000
10	1.2052	0.9196	1.2052	1.0370	1.3075	9.915	4	1.148	2.451	0.2251	1.2052	0.9196
20	1.0873	0.8296	1.0873	0.8850	1.3291	17.143	4	2.432	2.451	0.2251	1.1048	0.8429
40	1.1222	0.8562	1.1222	0.9083	1.2542	13.282	4	2.052	2.451	0.2251	1.1048	0.8429
*60	0.8577	0.6544	0.8577	0.7683	1.0333	14.108	4	4.933	2.451	0.2251	0.8577	0.6544
*80	0.6331	0.4831	0.6331	0.5175	0.8350	21.976	4	7.379	2.451	0.2251	0.6331	0.4831
*100	0.6127	0.4675	0.6127	0.5108	0.6742	11.712	4	7.601	2.451	0.2251	0.6127	0.4675

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98392	0.896	0.13378	-0.2328
Bartlett's Test indicates equal variances (p = 0.80)	3.05974	12.5916		
The control means are not significantly different (p = 0.39)	0.91673	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	40	60	48.9898	2.5	0.22507	0.17173	0.30787	0.01686	2.4E-07	6, 21
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	6.217	4.600	0.564	28.284	2.0100
IC10	12.554	8.871	1.056	59.047	1.9816
IC15	19.077	13.250	1.437	61.348	0.2829
IC20	44.554	11.010	0.000	55.445	-1.2176
IC25	49.859	7.039	16.523	64.234	-2.0244
IC40	66.353	4.822	52.143	83.982	0.3694
IC50	78.024				

* indicates IC estimate less than the lowest concentration

ToxCalc v5.0.32

Reviewed by: DS

Appendix E
Chironomus dilutus
Emergence Statistical Data

- Partial Life Cycle Survival
- Emergence

TVA: 5069-03

Emory River

Sample ID: GLW

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: NA	Test Photoperiod: 16:8
Sample ID: GLW(Glec Laboratory Water only)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 57 Date: 9/10/2011

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 2

☒ 0700 AD Renewal time/initials ☒ 1800 AD Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 074 AD ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ AD 1230 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	6	
1	—	—	NAV BHV
2	23.2	6.0	
3	23.2	6.5	
4			
5	—	—	NAV BHV
6			
7	—	—	NAV BHV
8	—	—	
9			
10	—	—	NAV BHV
11			
12	—	—	NAV BHV

Test Day: Day 58 Date: 9/11/2011

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: ~~2~~ 1 MW 9/17/11

☒ 0700 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1100 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	4	6	
1	—	—	—	NAV Ø
2	—	—	—	Ø
3	—	—	—	Ø
4				
5 *	23.1	7.98	7.0	NAV Ø ~~MW~~ ~~X~~ 9/17/11 MW 9/27/11
6				
7	23.0	7.60	5.4	NAV Ø
8	23.0	7.81	5.0	Ø
9				
10	—	—	—	NAV Ø
11				
12	—	—	—	NAV Ø

ALK S: 39.2 E: 44.1 4.9 x 20 = 98

HARD S: 19.3 E: 22.0 2.7 x 40 = 108

Ammonia: ND -0.03

SC: 301

SC: 304

SC: 302

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

* POOLED H2O

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Page 1 of 2
DS 8/4/11

Sample ID: GLW
Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: NA

Sample ID: GLW (Glec Laboratory Water) Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/10/2011	M F U	D A	SAM	8/~~12~~ 13/2011 DS 8/4/11	M F U	D A	DS	8/14/2011	M F U	D A	AD	8/18/2011	M F U	D A	MW
2	8/10/2011	M F U	D A	AD	8/18/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW
3	8/19/2011	M F U	D A	DS	8/19/2011	M F U	D A	MW	8/29/2011	M F U	D A	MW	8/21/2011	M F U	D A	KN
4	8/20/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW	9/1/2011	M F U	D A	AB	8/25/2011	M F U	D A	DS
5	8/20/2011	M F U	D A	MW	8/23/2011	M F U	D A	KN	9/2/2011	M F U	D A	ES	8/28/2011	M F U	D A	DS
6	8/21/2011	M F U	D A	KN	8/27/2011	M F U	D A	DS	9/3/2011	M F U	D A	MW	8/30/2011	M F U	D A	DS
7	8/25/2011	M F U	D A	MW	9/1/2011	M F U	D A	AD	9/3/2011	M F U	D A	MW	8/30/2011	M F U	D A	DS
8	8/26/2011	M F U	D A	MW	9/4/2011	M F U	D A	MW	9/4/2011	M F U	D A	MW	8/30/2011	M F U	D A	MLL
9	9/1/2011	M F U	D A	AD	9/5/2011	M F U	D A	MW	9/7/2011	M F U	D A	DS	8/~~30~~ 31/2011 DS 8/31/11	M F U	D A	DS
10	9/1/2011	M F U	D A	AD	/~~2011~~	M F U	D A		/~~2011~~	M F U	D A		8/31/2011	M F U	D A	DS
11	/~~2011~~	M F U	D A		/~~2011~~	M F U	D A		/~~2011~~	M F U	D A		9/3/2011	M F U	D A	MW
12	/~~2011~~	M F U	D A		/~~2011~~	M F U	D A		/~~2011~~	M F U	D A		9/5/2011	M F U	D A	MW

Replicate 1	Replicate 2	Replicate 3	Replicate 5
Number fully emerged live midges 10	Number fully emerged live midges 9	Number fully emerged live midges 9	Number fully emerged live midges 12
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 10	Total number alive pupae and midge 9	Total number alive pupae and midge 9	Total number alive pupae and midge 12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: GLW

Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: NA

Sample ID: GLW (Glec Laboratory Water) Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/11/2011	M F U	D A	new	8/18/2011	M F U	D A	new	8/12/2011	M F U	D A	eB	8/13/2011	M F U	D A	new
2	8/16/2011	M F U	D A	AD	8/19/2011	M F U	D A	new	8/16/2011	M F U	D A	DS	8/15/2011	M F U	D A	MLL
3	8/19/2011	M F U	D A	DS	8/23/2011	M F U	D A	KN	8/18/2011	M F U	D A	new	8/15/2011	M F U	D A	MLL
4	8/20/2011	M F U	D A	new	8/26/2011	M F U	D A	new	8/19/2011	M F U	D A	DS	8/18/2011	M F U	D A	new
5	8/21/2011	M F U	D A	KN	8/28/2011	M F U	D A	DS	8/25/2011	M F U	D A	DS	8/20/2011	M F U	D A	new
6	new 8/~~8~~ 8/23/11 /25/2011	M F U	D A	new	8/28/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS	8/24/2011	M F U	D A	AD
7	8/28/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS	8/26/2011	M F U	D A	new
8	8/30/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS	9/1/2011	M F U	D A	AM	9/2/2011	M F U	D A	DS
9	9/1/2011	M F U	D A	AD	8/30/2011	M F U	D A	DS	9/2/2011	M F U	D A	DS	9/2/2011	M F U	D A	DS
10	9/2/2011	M F U	D A	DS	8/31/2011	M F U	D A	DS	9/2/2011	M F U	D A	DS	9/2/2011	M F U	D A	DS
11	~~/ /2011~~	~~M F U~~	~~D A~~		8/31/2011	M F U	D A	DS	9/5/2011	M F U	D A	new	9/5/2011	M F U	D A	new
12	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

	Replicate 7	Replicate 8	Replicate 10	Replicate 12
Number fully emerged live midges	10	11	11	11
Number dead or partially emerged midges	Ø	Ø	Ø	Ø
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	10	11	11	11

20 day survival rep 4 - 12/12

20 day survival rep 6 - 9/12

20 day survival rep 9 - 12/12

20 day survival rep 11 - 12/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: LCS+GLW

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: NA	Test Photoperiod: 16:8
Sample ID: LCS+GLW(Laboratory Control Sediment + Glec Laboratory Water)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 2

~~X~~ 600 MW Renewal time/initials ☐ ——— Renewal time/initials

~~X~~ 1730 CB Renewal time/initials ☐ ——— Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 071 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

~~X~~ 510 MW chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AB
Meter ID	40	6	
1			
2			rep ended
3			
4	—	—	NAV
5			rep ended
6			
7	—	—	NAV
8	23.3	4.2	|
9	23.2	4.3	|
10			
11			
12			

Test Day: Day 51 Date: 9/04/201

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 1

~~X~~ 612 MW Renewal time/initials ☐ ——— Renewal

☐ ——— Renewal time/initials ☐ ——— Renewal

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ~~X~~ no ☐ n/a

~~X~~ 509 MW chemistries time/Initial dale down

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials MW
Meter ID	40	6	
1			
2	~~22.4~~ 9/4/11		
3			
4	22.9	3.1	Ø
5			
6			
7	22.9	3.3	Ø
8	—	—	Ø
9	—	—	Ø
10			
11			
12			

NH4: ND -2.03

	#4 DA	#113 SC
	7.43	312
	7.54	307

	end mL	start mL	mL used	
1/1/01	6.1	2.5	3.6	14
AK	24.3	19.0	5.3	10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: LCS + GLW

Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: NA

Sample ID: LCS+GLW (laboratory control sediment) Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	DR	8/8/2011	M F U	D A	eB	8/9/2011	M F U	D A	DS	8/9/2011	M F U	D A	DS
2	8/9/2011	M F U	D A	TB	8/9/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS	8/12/2011	M F U	D A	nur
3	8/11/2011	M F U	D A	MLL	8/13/2011	M F U	D A	nur	8/13/2011	M F U	D A	nur	8/12/2011	M F U	D A	nur
4	8/17/2011	M F U	D A	DS	8/18/2011	M F U	D A	nur	8/18/2011	M F U	D A	nur	8/16/2011	M F U	D A	DS
5	8/18/2011	M F U	D A	nur	8/19/2011	M F U	D A	nur	8/19/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS
6	8/19/2011	M F U	D A	nur	8/20/2011	M F U	D A	nur	8/20/2011	M F U	D A	nur	8/19/2011	M F U	D A	nur
7	8/20/2011	M F U	D A	nur	8/22/2011	M F U	D A	DS	8/29/2011	M F U	D A	nur	8/22/2011	M F U	D A	DS
8	8/22/2011	M F U	D A	DS	8/23/2011	M F U	D A	KN	8/30/2011	M F U	D A	DS	8/24/2011	M F U	D A	KAD
9	8/23/2011	M F U	D A	KN	8/23/2011	M F U	D A	KN	8/31/2011	M F U	D A	DS	8/27/2011	M F U	D A	DS
10	8/23/2011	M F U	D A	KN	8/24/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~		8/27/2011	M F U	D A	DS
11	8/24/2011	M F U	D A	KAD	8/28/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~		8/31/2011	M F U	D A	DS
12	8/25/2011	M F U	D A	DS	~~8/8/2~~ 8/31/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~		8/31/2011	M F U	D A	DS

	Replicate 1	Replicate 2	Replicate 4	Replicate 5
Number fully emerged live midges	12	12	9	12
Number dead or partially emerged midges	0	Ø	Ø	Ø
Number of live pupae at test termination	0	Ø	Ø	Ø
Total number alive pupae and midge	12	12	9	12
20 Day Survival	Rep 3 - 12/12	Rep 6 - 11/12	Rep 10 - 11/12	Rep 11 - 12/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

DS 8/4/11

Page ~~1~~ 2 of 2

Sample ID: LCS + GLW

Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: NA

Sample ID: LCS + GLW (Lab-Water Control Sediment) Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/10/2011	M F U	D A	SAM	8/11/2011	M F U	D A	nw	8/11/2011	M F U	D A	nw	~~8/12~~ ~~8/5/2011~~ DR 8/5/11	M F U	D A DR 8/5/11	~~nw~~ ~~DR~~ DR 8/5/11
2	8/12/2011	M F U	D A	nw	8/12/2011	M F U	D A	nw	8/12/2011	M F U	D A	nw	8/12/2011	M F U	D A	nw
3	8/12/2011	M F U	D A	TB	8/17/2011	M F U	D A	DS	8/13/2011	M F U	D A	nw	8/12/2011	M F U	D A	KN
4	8/14/2011	M F U	D A	KN	8/18/2011	M F U	D A	nw	8/18/2011	M F U	D A	nw	8/13/2011	M F U	D A	nw
5	8/17/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/20/2011	M F U	D A	nw	8/14/2011	M F U	D A	MLL
6	8/18/2011	M F U	D A	DR	8/19/2011	M F U	D A	DS	8/20/2011	M F U	D A	nw	8/15/2011	M F U	D A partially emerged	MLL
7	8/19/2011	M F U	D A	nw	8/20/2011	M F U	D A	nw	8/26/2011	M F U	D A	nw	8/15/2011	M F U	D A partially emerged	MLL
8	8/23/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS	8/30/2011	M F U	D A	nw	8/19/2011	M F U	D A	nw
9	8/23/2011	M F U	D A	KN	8/25/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/21/2011	M F U	D A	KN
10	8/26/2011	M F U	D A	nw	8/28/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/22/2011	M F U	D A	DS
11	8/28/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/26/2011	M F U	D A	nw
12	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		8/26/2011	M F U	D A	nw

Replicate 7	Replicate 8	Replicate 9	Replicate 12
Number fully emerged live midges 9	Number fully emerged live midges 11	Number fully emerged live midges 8	Number fully emerged live midges 10
Number dead or partially emerged midges ~~1~~ 2 nw 8/17/11	Number dead or partially emerged midges 0	Number dead or partially emerged midges 0	Number dead or partially emerged midges 2
Number of live pupae at test termination 0	Number of live pupae at test termination 0	Number of live pupae at test termination 0	Number of live pupae at test termination 0
Total number alive pupae and midge 9	Total number alive pupae and midge 11	Total number alive pupae and midge 8	Total number alive pupae and midge 10
~~20 Day Survival~~ Rep ____ - ____/12 MLL 9/27/11	~~20 Day Survival~~ Rep ____ - ____/12 MLL 9/27/11	~~20 Day Survival~~ Rep ____ - ____/12 MLL 9/27/11	~~20 Day Survival~~ Rep ____ - ____/12 MLL 9/27/11

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID:

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: N/A (Laboratory Control Sediment +	Test Photoperiod: 16:8
Sample ID: LCS + ERW (Emory River WATER)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 55	Number Daily Renewals: ~~2~~ 1 MLL 9/15/11
Date: 9/08/2011	~~*~~DS 6:26 renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water: Dechlor (Glec Laboratory Water)	☐ ——— renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water Batch ID (GLC Number): NA	Food: (Tetrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate
☑ 1145 AB chemistries time/Initial	Screens Cleaned: ☐ yes ☐ no ☑ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ ~~10~~ 12 organisms per replicate
Record Meter ID	40	4	6	113	~~116~~ AS 9/9/11	~~102~~ 4 AB 9/9/11	8	Int: MLL
1	—							—
2	—							—
3	—							—
4	—							—
5	23.1	7.29	3.3	250.6	116	102	—	Ø
6	23.1	7.40	4.1	250.5	—	—	—	Ø
7	—							Ø
8	—							—
9	—							Ø
10	—							MLL 09/8/11
11	—							MLL
12	—							—

(mL)	AlK	Hard.
End	42.0	39.7
Start (mL)	36.9	36.8
	5.1	2.9

NH4: ~~ND~~ 0.17 NS 9/9

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

Relative % Difference: RPD ≤15%	Ammonia Reporting Limits:	Observation Key:
RPD = $\frac{(S_1 - S_2)}{(S_1 + S_2)/2} \times 100 =$	RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible

QC'd by: MLL

Sample ID: LCSTERW

Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: NA

Sample ID: LCSTERW Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials
1	8/12/2011	M F U	D A	MW	8/8/2011	M F U	D A	KN	8/7/2011	M F U	D A	MW	8/8/2011	M F U	D A	KN
2	8/12/2011	M F U	D A	MW	8/12/2011	M F U	D A	MW	8/11/2011	M F U	D A	MLL	8/9/2011	M F U	D A	AD
3	8/12/2011	M F U	D A	TB	8/12/2011	M F U	D A	MW	8/13/2011	M F U	D A	MW	8/9/2011	M F U	D A	TB
4	8/14/2011	M F U	D A	MLL	8/17/2011	M F U	D A	DS	8/16/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS
5	8/14/2011	M F U	D A	MLL	8/18/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS	8/12/2011	M F U	D A	TB
6	8/16/2011	M F U	D A	DS	8/20/2011	M F U	D A	MW	8/22/2011	M F U	D A	DS	8/14/2011	M F U	D A	MLL
7	8/19/2011	M F U	D A	DS	8/20/2011	M F U	D A	MW	8/22/2011	M F U	D A	DS	8/17/2011	M F U	D A	DS
8	8/24/2011	M F U	D A	AD	8/27/2011	M F U	D A	DS	8/26/2011	M F U	D A	MW	8/17/2011	M F U	D A	AD
9	8/24/2011	M F U	D A	AD	8/29/2011	M F U	D A	MW	~~/2011~~	~~M F U~~	~~D A~~		8/20/2011	M F U	D A	MW
10	8/24/2011	M F U	D A	AD	8/29/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/21/2011	M F U	D A	KN
11	8/27/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	
12	9/1/2011	M F U	D A	AD	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	

Replicate 3	Replicate 5	Replicate 6	Replicate 7
Number fully emerged live midges 12	Number fully emerged live midges 10	Number fully emerged live midges 8	Number fully emerged live midges 10
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 12	Total number alive pupae and midge ~~Ø~~ 10 MW 9/17/11	Total number alive pupae and midge ~~Ø~~ 8 MW 9/17/11	Total number alive pupae and midge ~~Ø~~ 10 MW 9/17/11
20 Day Survival Rep 1 - 12/12	20 Day Survival Rep 2 - 11/12	20 Day Survival Rep 4 - 12/12	20 Day Survival Rep 10 - 11/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: LCS + ERW

Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: NA

Sample ID: LCS+ERW Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/17/2011	M F U	D A	new	8/9/2011	M F U	D A	AD	8/9/2011	M F U	D A	SAM	8/12/2011	M F U	D A	new
2	8/17/2011	M F U	D A	new	8/10/2011	M F U	D A	DJ	8/13/2011	M F U	D A	new	8/13/2011	M F U	D A	DJ
3	8/19/2011	M F U	D A	new	8/12/2011	M F U	D A	new	8/18/2011	M F U	D A	new	8/13/2011	M F U	D A	DJ
4	8/19/2011	M F U	D A	new	8/12/2011	M F U	D A	new	8/19/2011	M F U	D A	new	8/18/2011	M F U	D A	DR
5	8/20/2011	M F U	D A	new	8/12/2011	M F U	D A	TB	8/25/2011	M F U	D A	new	8/21/2011	M F U	D A	KN
6	8/20/2011	M F U	D A	new	8/18/2011	M F U	D A	new	8/26/2011	M F U	D A	new	8/21/2011	M F U	D A	KN
7	8/21/2011	M F U	D A	KN	8/21/2011	M F U	D A	KN	8/28/2011	M F U	D A	DJ	8/22/2011	M F U	D A	DJ
8	8/22/2011	M F U	D A	DJ	8/29/2011	M F U	D A	new	9/1/2011	M F U	D A	AD	8/23/2011	M F U	D A	KN
9	8/26/2011	M F U	D A	new	8/31/2011	M F U	D A	DJ	9/1/2011	M F U	D A AD 9/1/11 Partially emerged	AD	8/25/2011	M F U	D A	DS
10	8/30/2011	M F U	D A	DJ	9/2/2011	M F U	D A	DJ	9/4/2011	M F U	D A	new	8/30/2011	M F U	D A	DS
11	8/31/2011	M F U	D A	DJ	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		9/1/2011	M F U	D A	AD
12	9/1/2011	M F U	D A	AD	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		9/2/2011	M F U	D A	DJ

	Replicate 8	Replicate 9	Replicate 11	Replicate 12
Number fully emerged live midges	12	10	9	12
Number dead or partially emerged midges	Ø	Ø	1	Ø
Number of live pupae at test termination	Ø	Ø	1	Ø
Total number alive pupae and midge	12	~~Ø~~ 10	10	12

Ryw 9/1/11

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM Reference

Concentration: NA

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8981	Test Photoperiod: 16:8
Sample ID: ERM Reference	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water mw 9/7/11

Overlying Water Batch ID (GLC Number): 9049 59

Number Daily Renewals: 1

X 605 mw Renewal time/initials □ — Renewal time/initials

□ — Renewal time/initials □ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — □ Feed 1.5 ml/replicate

Screens Cleaned: □ yes ☑ no □ n/a

1515 mw chemistries time/Initial take down

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials mw
Meter ID	40	6	
1	—	—	Ø
2	—	—	Ø already ended mw 9/3/11
3	—	—	Ø
4	—	—	Ø
5			
6	—	—	Ø
7			
8			
9			
10	22.9	4.0	Ø
11	22.8	3.7	Ø
12			

NH4: ND 0.08

#4 pH	#113 SC
7.29	250.5
7.34	248.1

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049

Number Daily Renewals:

□ Renewal time/initials □ Renewal

□ Renewal time/initials □ Renewal

Food: (Tertrafin 4g/L) TFS# □ Feed 1.5 ml/replicate

Screens Cleaned: □ yes □ no □ n/a

□ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials
Meter ID			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

mw 9/3/11

AS

	End mL	Start mL	mL used	
Hardness	13.4	10.4	3.0	120
Alk	34.3	29.3 ~~23~~ AS 9/3/11	5.0	100
Duplicate				
Hard.	22.6	19.5	3.1	124
Alk	44.4	39.4	5.0	100

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERS + ERW

Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8981

Sample ID: ERM Reference Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	MW	8/9/2011	M F U	D A	AD	8/11/2011	M F U	D A	MW	8/8/2011	M F U	D A	KN
2	8/6/2011	M F U	D A	MW	8/10/2011	M F U	D A	DS	8/11/2011	M F U	D A	MLL	8/8/2011	M F U	D A	KN
3	8/11/2011	M F U	D A	MW	8/10/2011	M F U	D A	DS	8/12/2011	M F U	D A	TB	8/9/2011	M F U	D A	AD
4	8/17/2011	M F U	D A	DS	8/14/2011	M F U	D A	AD	8/13/2011	M F U	D A	DS	8/12/2011	M F U	D A	MW
5	8/19/2011	M F U	D A	MW	8/18/2011	M F U	D A	MW	8/14/2011	M F U	D A	MLL	8/12/2011	M F U	D A	↓
6	8/22/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/15/2011	M F U	D A	MLL	8/12/2011	M F U	D A	↓
7	8/24/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/12/2011	M F U	D A	TB
8	8/26/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS	8/19/2011	M F U	D A	MW	8/14/2011	M F U	D A	KN
9	8/24/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN
10	~~/ /2011~~	~~M F U~~	~~D A~~		8/22/2011	M F U	D A	DS	8/30/2011	M F U	D A	AD	8/21/2011	M F U	D A Partially emerged	KN
11	~~/ /2011~~	~~M F U~~	~~D A~~		8/25/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		8/26/2011	M F U	D A	MW	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

Replicate 1	Replicate 2	Replicate 3	Replicate 4
Number fully emerged live midges 9	Number fully emerged live midges 12	Number fully emerged live midges 10	Number fully emerged live midges 8
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 2
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 9	Total number alive pupae and midge 12	Total number alive pupae and midge 10	Total number alive pupae and midge 8
20 Day Survival Rep 5 - 11 /12	20 Day Survival Rep 7 - 12 /12	20 Day Survival Rep 9 - 12 /12	20 Day Survival Rep 12 - 12 /12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERS + ERW

Concentration:

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8981

Sample ID: ERM Reference Concentration: NA

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials
1	8/11/2011	M F U	D A	MW	8/5/2011	M F U	D A	DR	8/8/2011	M F U	D A	DS	8/6/2011	M F U	D A	DS
2	8/12/2011	M F U	D A	MW	8/6/2011	M F U	D A	DS	8/10/2011	M F U	D A	EB	8/6/2011	M F U	D A	MW
3	8/12/2011	M F U	D A	MW	5/18/11 8/8/2011	M F U	D A DS 8/9/11	DS	8/15/2011	M F U	D A	MLL	8/7/2011	M F U	D A	MW
4	8/12/2011	M F U	D A	TB	DS 8/8/2011	M F U	D A 8/9/11 AD	AD DS 8/9/11	8/16/2011	M F U	D A	DS	8/8/2011	M F U	D A	KN
5	8/13/2011	M F U	D A	MW	8/9/2011	M F U	D A	AD	8/16/2011	M F U	D A	AD	8/8/2011	M F U	D A	KN
6	8/16/2011	M F U	D A	DS	8/12/2011	M F U	D A	MW	8/18/2011	M F U	D A	MW	8/9/2011	M F U	D A	AD
7	8/21/2011	M F U	D A	KN	8/12/2011	M F U	D A	MW	8/19/2011	M F U	D A	AD	8/9/2011	M F U	D A	AD
8	8/26/2011	M F U	D A	MW	8/13/2011	M F U	D A	DS	8/20/2011	M F U	D A	TB	8/12/2011	M F U	D A	MW
9	8/26/2011	M F U	D A	MW	8/16/2011	M F U	D A	DS	8/25/2011	M F U	D A	DS	8/19/2011	M F U	D A	MW
10	~~/ /2011~~	~~M F U~~	~~D A~~		8/17/2011	M F U	D A	DS	8/26/2011	M F U	D A	MW	8/23/2011	M F U	D A	KN
11	~~/ /2011~~	~~M F U~~	~~D A~~		8/23/2011	M F U	D A	KN	8/30/2011	M F U	D A	MW	~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		8/26/2011	M F U	D A	MW	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

Replicate 6	Replicate 8	Replicate 10	Replicate 11
Number fully emerged live midges 6	Number fully emerged live midges 11	Number fully emerged live midges 10	Number fully emerged live midges 8
Number dead or partially emerged midges 3	Number dead or partially emerged midges 1	Number dead or partially emerged midges 1	Number dead or partially emerged midges 2
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 6	Total number alive pupae and midge 11	Total number alive pupae and midge 10	Total number alive pupae and midge 8

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water 59

Overlying Water Batch ID (GLC Number): 904~~9~~ mw 9/7/11

Number Daily Renewals: 2

~~1600~~ mw Renewal time/initials — Renewal time/initials

~~1743~~ ~~ES~~ Renewal time/initials — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 071 ✓ Feed 1.5 ml/replicate

Screens Cleaned: □ yes ✓ no □ n/a

~~1~~510 mw chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AS
Meter ID	40	6	
1			
2	—	—	NAV
3			
4	—	—	NAV
5			
6			
7	—	—	NAV
8			
9	23.2	4.0	NAV
10			
11			
12	23.2	4.3	NAV

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 904~~9~~ 59 mw 9/7/11

Number Daily Renewals: ~~2~~ 1 mw 9/4/11

~~1~~612 mw Renewal time/initials □ — Renewal

□ — Renewal time/initials □ — Renewal

Food: (Tertrafin 4g/L) TFS# — □ Feed 1.5 ml/replicate

Screens Cleaned: □ yes ✓ no □ n/a

~~1~~509 mw chemistries time/Initial ~~Toledown~~

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials mw
Meter ID	40	6	
1			
2	23.0	3.0	Ø
3			
4	23.0	2.9	Ø
5			
6			
7	—	—	Ø
8			
9	—	—	Ø
10			
11			
12			

NH4: ND -2.05

	#4 pH	#113 SC
	7.16	251.3
	7.19	253.2

AS

	Std mL	Start mL	mL Used	
Hard:	16.1	13.2	2.9	116
Alk:	40.0	34.9	5.1	10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Page 1 of 2 DS 8/4/11

Sample ID: ERM 0.5

Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982

Sample ID: ERM 0.5 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials
1	8/11/2011	M F U	D A	new	08/04/2011	M F U	D A	AD	8/8/2011	M F U	D A	KN	8/7/2011	M F U	D A	new
2	8/11/2011	M F U	D A	new	08/07/2011	M F U	D A	AD	8/9/2011	M F U	D A	DS	8/7/2011	M F U	D A	AD
3	8/12/2011	M F U	D A	TB	~~08/08/2011~~ 8/8/11	M F U	D A	DS 8/8/11 ~~KN~~	8/10/2011	M F U	D A	DS	8/9/2011	M F U	D A	DS
4	8/15/2011	M F U	D A	MLL	8/10/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS	8/9/2011	M F U	D A	DS
5	8/16/2011	M F U	D A	DS	8/15/2011	M F U	D A	MLL	8/11/2011	M F U	D A	EB	8/10/2011	M F U	D A	DS
6	8/18/2011	M F U	D A	new	8/20/2011	M F U	D A	new	8/12/2011	M F U	D A	new	8/11/2011	M F U	D A	EB
7	8/18/2011	M F U	D A	new	8/22/2011	M F U	D A Partially emerged	KN	8/12/2011	M F U	D A	new	8/14/2011	M F U	D A	MLL
8	8/19/2011	M F U	D A	DS	8/26/2011	M F U	D A	new	8/16/2011	M F U	D A	DS	8/18/2011	M F U	D A	new
9	8/21/2011	M F U	D A	KN	8/26/2011	M F U	D A	new	8/16/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS
10	8/24/2011	M F U	D A	AD	8/29/2011	M F U	D A	new	8/17/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS
11	8/24/2011	M F U	D A	AD	~~/2011~~	M F U	D A		8/26/2011	M F U	D A	new	~~/2011~~	M F U	D A	
12	8/26/2011	M F U	D A	new	~~/2011~~	M F U	D A		~~/2011~~	M F U	D A		~~/2011~~	M F U	D A	

	Replicate 1	Replicate 2	Replicate 4	Replicate 7
Number fully emerged live midges	12	9	11	9
Number dead or partially emerged midges	Ø	1	Ø	1
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	12	9	11	9

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

DS 8/4/11

Sample ID: ERM 0.5

Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982

Sample ID: ERM 0.5 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/6/2011	M F U	D A	mw	8/6/2011	M F U	D A	mw	8/7/2011	M F U	D A	mw	8/4/2011	M F U	D A	DS
2	8/8/2011	M F U	D A	KN 8/9/11 MKN	8/8/2011	M F U	D A	KN	8/9/2011	M F U	D A	DS	8/4/2011	M F U	D A	MLL
3	8/8/2011	M F U	D A	DS	8/9/2011	M F U	D A	DS	8/10/2011	M F U	D A	MLL	8/5/2011	M F U	D A	DR
4	8/8/2011	M F U	D A	DS	8/10/2011	M F U	D A	SAM	8/13/2011	M F U	D A	mw	8/6/2011	M F U	D A	SAM
5	8/9/2011	M F U	D A	MLL	8/10/2011	AP 8/10/11 M F U	D A	AD	8/14/2011	M F U	D A	MLL	8/7/2011	M F U	D A	mw
6	8/15/2011	M F U	D A	TB	8/16/2011	M F U	D A	DS	8/18/2011	M F U	D A	mw	8/10/2011	M F U	D A	DS
7	8/17/2011	M F U	D A	DS	8/16/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/11/2011	M F U	D A	EB
8	8/18/2011	M F U	D A	mw	8/17/2011	M F U	D A	DS	8/19/2011	M F U	D A	AD	8/16/2011	M F U	D A	DS
9	8/19/2011	M F U	D A	AD	8/19/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS	8/17/2011	M F U	D A	DS
10	8/21/2011	M F U	D A	KN	8/19/2011	M F U	D A	AD	8/25/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS
11	8/22/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/30/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS
12	8/22/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/31/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~	

Replicate 8	Replicate 9	Replicate 11	Replicate 12
Number fully emerged live midges 11	Number fully emerged live midges 9	Number fully emerged live midges 12	Number fully emerged live midges 11
Number dead or partially emerged midges 1	Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge ~~Ø~~ 11 mw 8/22/11	Total number alive pupae and midge 9	Total number alive pupae and midge 12	Total number alive pupae and midge 11
20 Day Survival Rep 3 - 12 /12	20 Day Survival Rep 5 - ____ /12 11+1 midge/12	20 Day Survival Rep 6 - 12 /12	20 Day Survival Rep 10 - ____ /12 7+2 pupae/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

Sample ID: ERM 0.5
Concentration: ~~NA~~ DS 9/8/11 2.0%

TVA: 5069-03

Emory River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8982
Sample ID: ERM 0.5 2.0%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/11
Test Initiation Date: 07/15/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS <24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 55
Date: 9/08/2011
Overlying Water: Dechlor (Glec Laboratory Water)
Overlying Water Batch ID (GLC Number): NA
1145 MB chemistries time/Initial

Number Daily Renewals: ~~1~~ 1 9/15/11 MLL
DS 6:26 renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: (Tetrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☑ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ ~~10~~ 12 organisms per replicate
Record Meter ID	40	4	6	113	MB 9/8/11 ~~120~~	MB 9/8/11 ~~100~~ 4		Int: nur
1	22.8	7.45	4.2	248.7	120	100		Ø
2	—							—
3	—							—
4	23.0	7.48	4.1	252.4	—			Ø
5	—							Ø
6	—							—
7	—							1
8	—							Ø
9	—							Ø
10	—							—
11	—							1
12	—							Ø

	Alk.	Hard
End mL	~~45.6~~ 47.0 MB 9/8/11	42.7
Start mL	42.0	39.7
	5.0	3.0

NH4: 0.10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

Relative % Difference: RPD ≤15%

$$RPD = \frac{(S_1 - S_2)}{(S_1 + S_2)/2} \times 100 =$$

Ammonia Reporting Limits:
RL = Reporting Limit (0.10 mg/L).
MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10.
J = ≥ MDL and < RL.
U = Below MDL.

Observation Key:
AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

QC'd by: MLL

Sample ID: Erm 0.5
Concentration: 20%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982
Sample ID: ERM 0.5 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials
1	8/3/2011	M F U	D A	DS	8/3/2011	M F U	D A	SC	8/12/2011	M F U	D A	NW	8/4/2011	M F U	D A	DS
2	8/5/2011	M F U	D A	DR	8/4/2011	M F U	D A	DS	8/12/2011	M F U	D A	TB	8/8/2011	M F U	D A	KN
3	8/7/2011	M F U	D A	NW	8/5/2011	M F U	D A	DR	8/15/2011	M F U	D A	MLL	8/11/2011	M F U	D A	EB
4	8/8/2011	M F U	D A	KN	8/11/2011	M F U	D A	EB	8/17/2011	M F U	D A	DS	8/12/2011	M F U	D A	NW
5	8/8/2011	M F U	D A	MLL	8/13/2011	M F U	D A	DS	8/18/2011	M F U	D A	DR	8/12/2011	M F U	D A	KN
6	8/12/2011	M F U	D A	NW	8/16/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/13/2011	M F U	D A	DS
7	8/15/2011	M F U	D A partially emerged	MLL	8/17/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/16/2011	M F U	D A	ES
8	8/23/2011	M F U	D A	KN	8/19/2011	M F U	D A	AD	8/22/2011	M F U	D A	DS	8/23/2011	M F U	D A	KN
9	9/4/2011	M F U	D A	NW	8/21/2011	M F U	D A	KN	~~/2011~~	~~M F U~~	~~D A~~		8/25/2011	M F U	D A	DS
10	~~/2011~~	~~M F U~~	~~D A~~		8/25/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/27/2011	M F U	D A	DS
11	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	M F U	D A		~~/2011~~	~~M F U~~	~~D A~~	
12	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	D A		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	

	Replicate 1	Replicate 4	Replicate 5	Replicate 7
Number fully emerged live midges	8	10	8	10
Number dead or partially emerged midges	1	Ø	Ø	Ø
Number of live pupae at test termination	Ø	Ø	Ø	1
Total number alive pupae and midge	~~Ø~~ 8 NW 9/7/11	10 ~~Ø~~ NW 9/7/11	~~Ø~~ 8 NW 9/7/11	11

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 0.5
Concentration: 20%

DS 8/4/11

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982
Sample ID: ERM 0.5 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/7/2011	M F U	D A	NW	8/8/2011	M F U	D A	KN	8/5/2011	M F U	D A	NW	8/4/2011	M F U	D A	DS
2	8/9/2011	M F U	D A	DS	8/8/2011	M F U	D A	MLL	8/9/2011	M F U	D A	DS	8/5/2011	M F U	D A	NW
3	8/14/2011	M F U	D A	MLL	8/12/2011	M F U	D A	TB	8/13/2011	M F U	D A	DS	8/6/2011	M F U	D A	NW
4	8/15/2011	M F U	D A	MLL	8/16/2011	M F U	D A	DS	8/14/2011	M F U	D A	MLL	8/8/2011	M F U	D A	KN
5	8/17/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/20/2011	M F U	D A	NW	8/8/2011	M F U	D A	MLL
6	8/19/2011	M F U	D A	DS	8/20/2011	M F U	D A	NW	8/20/2011	M F U	D A	NW	8/17/2011	M F U	D A	DS
7	8/19/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN	8/25/2011	M F U	D A	DS	8/17/2011	M F U	D A	DS
8	8/22/2011	M F U	D A	DS	8/23/2011	M F U	D A	KN	8/29/2011	M F U	D A	NW	8/19/2011	M F U	D A	DS
9	8/25/2011	M F U	D A	DS	8/24/2011	M F U	D A	AO	9/1/2011	M F U	D A	AO	8/24/2011	M F U	D A	AO
10	8/29/2011	M F U	D A	DS	8/24/2011	M F U	D A	AS	~~/2011~~	~~M F U~~	~~D A~~		8/26/2011	M F U	D A	NW
11	9/4/2011	M F U	D A	NW	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	
12	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	

Replicate 8	Replicate 9	Replicate 11	Replicate 12
Number fully emerged live midges 11	Number fully emerged live midges 10	Number fully emerged live midges 9	Number fully emerged live midges 10
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination 1	Number of live pupae at test termination Ø
Total number alive pupae and midge Ø 11 (NW 9/17/11)	Total number alive pupae and midge Ø 10 (NW 9/17/11)	Total number alive pupae and midge 10	Total number alive pupae and midge Ø 10 (NW 9/17/11)
20 Day Survival Rep 2 - ____/12 11+1 pupae/12	20 Day Survival Rep 3 - ____/12 9+2 pupae/12	20 Day Survival Rep 6 - ____/12 11+1 midge/12	20 Day Survival Rep 10 - ____/12 8+1 pupae+1 midge/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9045 59 9/7/11 NW

Number Daily Renewals: 2

☒ 1600 NW Renewal time/initials ☐ — Renewal time/initials

☒ 1730 BB Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 071 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 510 NW chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials RS
Meter ID	40	6	
1			
2	—	—	
3	—	—	NAV
4	—	—	|
5	—	—	|
6			
7			
8	—	—	NAV
9	23.2	4.6	|
10	23.2	4.4	|
11			
12			

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9045 59 NW 9/7/11

Number Daily Renewals: 1

☒ 617 NW Renewal time/initials ☐ — Renewal

☐ — Renewal time/initials ☐ — Renewal

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 509 NW chemistries time/Initial stale down

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials NW
Meter ID	40	6	
1 NW 9/4/11			
~~1~~ 3	23.0	4.4	Ø
~~1~~ 4	23.0	4.4	Ø
~~1~~ 5	—	—	Ø
~~1~~ 2	—	—	
6			
7			
8	—	—	Ø
9	—	—	Ø
10	—	—	Ø
11			
12			

NH4: ND -2.06

#4 pH	#113 SC
7.45	257.4
7.48	263.4

RS

	End mL	Start mL	mL used	
Hard	19.3	16.1	3.2	128
Alk	44.9	40.0	4.9	98

rep ended

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 0.5

Concentration: 40%

DS 8/19/11

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982

Sample ID: ERM 0.5 Concentration: 40%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	KN	8/6/2011	M F U	D A	SAM	8/7/2011	M F U	D A	AD	8/7/2011	M F U	D A	[illegible]
2	8/9/2011	M F U	D A	DS	8/8/2011	M F U	D A	KN	8/9/2011	M F U	D A	DS	8/12/2011	M F U	D A	[illegible]
3	8/10/2011	M F U	D A	DS	8/9/2011	M F U	D A	DS	8/12/2011	M F U	D A	[illegible]	8/14/2011	M F U	D A	MLL
4	8/10/2011	M F U	D A	DS	8/12/2011	M F U	D A	[illegible]	8/12/2011	M F U	D A	[illegible]	8/14/2011	M F U	D A	MLL
5	8/12/2011	M F U	D A	TB	8/15/2011	M F U	D A	MLL	8/13/2011	M F U	D A	KN	8/15/2011	M F U	D A	MLL
6	8/16/2011	M F U	D A	DS	8/20/2011	M F U	D A	[illegible]	8/20/2011	M F U	D A	[illegible]	8/16/2011	M F U	D A	DS
7	8/19/2011	M F U	D A	DS	8/20/2011	M F U	D A	TB	8/26/2011	M F U	D A	[illegible]	8/16/2011	M F U	D A	DS
8	8/22/2011	M F U	D A	KN	8/29/2011	M F U	D A	[illegible]	8/27/2011	M F U	D A	DS	8/19/2011	M F U	D A	AD
9	8/23/2011	M F U	D A	KN	~~/2011~~	~~M F U~~	~~D A~~		8/27/2011	M F U	D ~~A~~ AD 8/27/11	AD	8/22/2011	DS 8/22/11 ~~M~~ F U	D A	DS
10	8/26/2011	M F U	D A	[illegible]	~~/2011~~	~~M F U~~	~~D A~~		8/30/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS
11	8/27/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		8/31/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~	
12	8/27/2011	M F U	D A	DS	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	

	Replicate 2	Replicate 3	Replicate 4	Replicate 5
Number fully emerged live midges	12	6	6	10
Number dead or partially emerged midges	Ø	2	5	Ø
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	12	6	6	10

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

QC'd by: MLL

Sample ID: Erm 0.5

Concentration: 40%

DS 8/4/11

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982

Sample ID: Erm 0.5 Concentration: 40%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	AD	08/06/2011	M F U	D A	DS	8/6/2011	M F U	D A	MW	8/3/2011	M F U	D A	DS
2	8/6/2011	M F U	D A	MW	8/13/2011	M F U	D A	DS	8/6/2011	M F U	D A	MW	8/9/2011	M F U	D A	DS
3	8/7/2011	M F U	D A	AD	8/13/2011	M F U	D A	DS	8/8/2011	M F U	D A	KN	8/11/2011	M F U	D A	EB
4	8/10/2011	M F U	D A	AD	8/19/2011	M F U	D A	DS	8/9/2011	M F U	D A	DS	8/12/2011	M F U	D A	MW
5	8/14/2011	M F U	D A	AD	8/19/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS	8/15/2011	M F U	D A	MLL
6	8/18/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS	8/19/2011	M F U	D A	MW	8/16/2011	M F U	D A	DS
7	8/18/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW	8/21/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS
8	8/21/2011	M F U	D A	KN	8/29/2011	M F U	D A	MW	8/26/2011	M F U	D A	MW	8/26/2011	M F U	D A	MW
9	8/23/2011	M F U	D A	KN	~~/ /2011~~	~~M F U~~	~~D A~~		8/30/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~	
10	8/25/2011	M F U	D A	AB	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
11	8/26/2011	M F U	D A	MW	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
12	8/26/2011	M F U	D A	MW	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

	Rep 7	Rep 8	Rep 9	Rep 10
Number fully emerged live midges	12	8	9	8
Number dead or partially emerged midges	Ø	Ø	Ø	Ø
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	12	8	9	8

20 Day Survival	Rep 1 - 12 /12	Rep 6 - ____ /12 10+1 midge/12	Rep 11 - 12 /12	Rep 12 - ____ /12 10+2 midges/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: ~~NA~~ 60% DS 9/8/11

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 55	Number Daily Renewals: ~~2~~ 1 9/15/11 MLL
Date: 9/08/2011	~~X~~ DS 6:26 renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water: Dechlor (Glec Laboratory Water)	☐ ——— renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water Batch ID (GLC Number): NA	Food: (Tetrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate
☑ 1145 AS chemistries time/Initial	Screens Cleaned: ☐ yes ☐ no ☑ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ ~~10~~ 12 new 9/8/11 organisms per replicate
Record Meter ID	40	4	6	113	AS 9/8/11 ~~116~~	AS 9/8/11 ~~100~~ 4		Int: New
1	—							—
2	—						—	—
3	23.0	7.48	4.3	254.4	116	100	—	1
4	—							—
5	23.0	7.49	4.4	251.9	—			Ø
6	—							Ø
7	—							Ø
8	—							—
9	—							Ø
10	—							1
11	—							Ø
12	—							Ø

	Alk.	Hard.
End mL	9.9	45.6
Start mL	~~45.6~~ 4.9 AS 9/8/11	42.7
	5.0	2.9

NH4: ND 0.02

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

Relative % Difference: RPD ≤15% RPD = $\frac{(s_1 - s_2)}{(s_1 + s_2)/2}$ x 100 =	**Ammonia Reporting Limits:** RL = Reporting Limit (0.10 mg/L). MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10. J = ≥ MDL and < RL. U = Below MDL.	Observation Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible

QC'd by: MLL

Page ~~2~~ 1 of 2 DS 8/11/11

Sample ID: ERM 0.5
Concentration: 60%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982
Sample ID: ERM 0.5 Concentration: 60%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials
1	8/9/2011	M F U	D A	DS	8/4/2011	M F U	D A	AD	08/06/2011	M F U	D A	AD	8/5/2011	M F U	D A	DR
2	8/10/2011	M F U	D A	DS	8/5/2011	M F U	D A	NW	8/11/2011	M F U	D A	NW	8/8/2011	M F U	D A	KN
3	8/11/2011	M F U	D A	MLL	08/07/2011	M F U	D A	AD	~~8/14/2011~~	~~M F U~~	~~D A~~ KN 8/14/11	~~KN~~	8/15/2011	M F U	D A	EB
4	8/17/2011	M F U	D A	DS	8/9/2011	M F U	D A	DS	8/18/2011	M F U	D A	NW	8/18/2011	M F U	D A	DR
5	8/17/2011	M F U	D A	DS	8/15/2011	M F U	D A	MLL	8/20/2011	M F U	D A	NW	8/22/2011	M F U	D A	DS
6	8/25/2011	M F U	D A	NW	8/17/2011	M F U	D A	DS	8/20/2011	M F U	D A	TB	8/25/2011	M F U	D A	DS
7	8/29/2011	M F U	D A	NW	8/18/2011	M F U	D A	DS	8/24/2011	M F U	D A	AB	8/26/2011	M F U	D A	NW
8	~~/ /2011~~	~~M F U~~	~~D A~~		8/29/2011	M F U	D A	NW	8/26/2011	M F U	D A	NW	8/26/2011	M F U	D A	NW
9	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		8/29/2011	M F U	D A	NW	8/29/2011	M F U	D A	NW
10	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		8/29/2011	M F U	D A	NW	8/30/2011	M F U	D A	DS
11	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

Replicate 3	Replicate 5	Replicate 6	Replicate 7
Number fully emerged live midges 7	Number fully emerged live midges 8	Number fully emerged live midges 8	Number fully emerged live midges 9
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1	Number dead or partially emerged midges 1
Number of live pupae at test termination 1	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 8 (Aug 9/17/11)	Total number alive pupae and midge 8 (Aug 9/17/11)	Total number alive pupae and midge 8 (Aug 9/17/11)	Total number alive pupae and midge 9 (Aug 9/17/11)

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 0.5
Concentration: 60%

DS 8/4/11

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982
Sample ID: ERM 0.5 Concentration: 60%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/5/2011	(M) F U	D (A)	DR	8/7/2011	(M) F U	D (A)	MLL	8/9/2011	(M) F U	D (A)	DS	8/11/2011	(M) F U	D (A)	MLL
2	8/10/2011	M F (U)	D (A)	MLL	8/8/2011	(M) F U	D (A)	KN	8/14/2011	M (F) U	D (A)	AD	8/12/2011	(M) F U	D (A)	MLL
3	8/11/2011	(M) F U	D (A)	KN	8/18/2011	(M) F U	D (A)	MLL	8/16/2011	M (F) U	D (A)	AD	8/19/2011	(M) F U	D (A)	DS
4	8/13/2011	(M) F U	D (A)	DS	8/18/2011	M (F) U	D (A)	MLL	8/20/2011	(M) F U	D (A)	MLL	8/21/2011	M (F) U	D (A)	KN
5	8/20/2011	(M) F U	D (A)	MLL	8/25/2011	(M) F U	D (A)	MLL	8/22/2011	(M) F U	D (A)	DS	8/26/2011	(M) F U	D (A)	MLL
6	8/20/2011	MLL 8/24/11 (M) (F) U	D (A)	MLL	8/29/2011	M (F) U	D (A)	MLL	8/22/2011	(M) F U	D (A)	DS	9/1/2011	M (F) U	D (A)	AD
7	8/21/2011	(M) F U	D (A)	KN	9/4/2011	(M) F U	D (A)	MLL	8/27/2011	(M) F U	D (A)	DS	9/2/2011	(M) F U	D (A)	DS
8	8/22/2011	M (F) U	D (A)	DS	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		9/2/2011	M (F) U	D (A)	DS
9	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
10	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
11	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

	Replicate 9	Replicate 10	Replicate 11	Replicate 12
Number fully emerged live midges	8	7	7	8
Number dead or partially emerged midges	Ø	Ø	Ø	Ø
Number of live pupae at test termination	Ø	1	Ø	Ø
Total number alive pupae and midge	MLL 9/7/11 Ø 8	MLL 9/7/11 8 8	MLL 9/7/11 Ø 7	MLL 9/7/11 Ø 8
20 Day Survival	Rep 1 - ___/12 10+2 midges/12	Rep 2 - 11/12	Rep 4 - 12/12	Rep 8 - ___/12 10+1 pupae/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 57 Date: 9/10/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals: 2

☒ 0700 AD Renewal time/initials ☒ 1800 AD Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 074 AD ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1230 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	6	
1	—	—	FOV NAV BHV
2			
3	22.8	4.3	NAV BHV
4	22.8	3.9	
5	—	—	
6			
7	—	—	NAV BHV
8			
9	—	—	NAV BHV
10	—	—	
11	—	—	
12			

Test Day: Day 58 Date: 9/11/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals: ~~2~~ 1 Mw 9/17/11

☒ 0700 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1100 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials AD	
Meter ID	40	4	6		
1	—	—	—	NAV Ø	
2					
3	—	—	—	NAV Ø	
4 *	~~23.1~~ 23.1 AD 9/10/11	7.83	6.7	Ø	SC: 259
5	22.9	7.57	3.8	Ø	SC: 253
6					
7	23.0	7.64	4.5	NAV Ø	SC: 259
8					
9	—	—	—	1 worm	
10	—	—	—	4 worms, 1 pupa	
11	—	—	—	NAV Ø	
12					

HARD
S: 22.7
E: 25.7
3.0x40
= 120

ALK
S: 19.5
E: 25.2
5.7x20
= 114

NH4: ND
-0.07

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

* POOLED H2O

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 0.5
Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982
Sample ID: ERM 0.5 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/8/2011	M (F) U	D (A)	DS	8/11/2011	(M) F U	D (A)	MLL	8/4/2011	(M) F U	D (A)	DS	8/8/2011	(M) F U	D (A)	KN
2	8/14/2011	(M) F U	D (A)	MLL	8/12/2011	(M) F U	D (A)	MLL	8/9/2011	(M) F U	D (A)	MLL	8/9/2011	(M) F U	D (A)	DS
3	8/14/2011	(M) F U	D (A)	MLL	8/17/2011	(M) F U	D (A)	DS	8/22/2011	(M) F U	D (A)	DS	8/11/2011	(M) F U	D (A)	MLL
4	8/15/2011	M (F) U	D (A)	MLL	8/17/2011	M (F) U	D (A)	DS	8/24/2011	M F (U)	(D) A noted in daily datasheet	AS	8/12/2011	M (F) U	D (A)	MLL
5	8/18/2011	M (F) U	D (A)	DR	8/18/2011	M (F) U	D (A)	MLL	8/25/2011	(M) F U	D (A)	DS	8/15/2011	(M) F U	D (A)	MLL
6	8/22/2011	M (F) U	D (A)	DS	8/21/2011	M (F) U	D (A)	KN	8/25/2011	M (F) U	D (A)	DS	8/16/2011	M F (U)	D (A)	SAM
7	8/24/2011	(M) F U	D (A)	AM	8/22/2011	(M) F U	D (A)	DS	8/30/2011	(M) F U	D (A)	DS	8/24/2011	M (F) U	D (A)	AD
8	~~/ /2011~~	~~M F U~~	~~D A~~		8/26/2011	(M) F U	D (A)	MLL	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
9	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
10	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
11	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

	Replicate 1	Replicate 3	Replicate 4	Replicate 5
Number fully emerged live midges	7	8	6	7
Number dead or partially emerged midges	Ø	Ø	1	Ø
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	7	8	6	7

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 0.5

Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982

Sample ID: ERM 0.5 Concentration: 80%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	AD	8/18/2011	M F U	D A	new	8/11/2011	M F U	D A	new	8/5/2011	M F U	D A	DR
2	8/5/2011	M F U	D A	DR	8/19/2011	M F U	D A	DS	8/12/2011	M F U	D A	KN	8/11/2011	M F U	D A	CB
3	8/18/2011	M F U	D A	new	8/20/2011	M F U	D A	new	8/25/2011	M F U	D A	new	8/13/2011	M F U	D A	KN
4	8/25/2011	M F U	D A	new	8/25/2011	M F U	D A	DS	8/26/2011	M F U	D A	new	8/15/2011	M F U	D A	TB
5	8/25/2011	M F U	D A	new	8/29/2011	M F U	D A	new	8/30/2011	M F U	D A	DS	8/20/2011	M F U	D A	TB
6	8/28/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~		9/7/2011	M F U	D A	DS	9/1/2011	M F U	D A	AP
7	8/30/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~		9/7/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~	
8	9/4/2011	M F U	D A	new	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
9	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
10	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
11	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

	Replicate 7	Replicate 9	Replicate 10	Replicate 11
Number fully emerged live midges	8	4	7	2
Number dead or partially emerged midges	Ø	1	Ø	4
Number of live pupae at test termination	Ø	1	5	Ø
Total number alive pupae and midge	8	5	12	2
20 Day Survival Rep	2 - 12 /12	6 - ___ /12 11+1 midge/12	8 - 12 /12	12 - 11 /12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 0.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8982	Test Photoperiod: 16:8
Sample ID: ERM 0.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 57 Date: 9/10/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals: 2

☒ 0700 AD Renewal time/initials ☒ 1800 AD Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 074 AD ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1230 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	6	
1			
2			
3	22.8	4.5	NAV BHV
4	22.9	5.0	
5	—	—	
6	—	—	
7	—	—	
8	—	—	
9			
10	—	—	NAV BHV
11	—	—	
12			

Test Day: Day 58 Date: 9/11/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals: ~~2~~ 1 mus 9/17/11

☒ 0700 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1100 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials AD	
Meter ID	40	4	6		
1					
2					
3	—	—	—	NAV Ø	
4	—	—	—	Ø	
5 *	23.2	7.79	6.6	Ø	SC: 259
6	22.8	7.64	3.8	Ø	SC: 261
7	23.0	7.67	4.3	Ø	SC: 258
8	—	—	—	Ø	
9					
10	—	—	—	NAV Ø	
11	—	—	—	Ø	
12					

HARD
S: 25.7
E: 28.7
3.0 x 40 = 120

ALK
S: 25.2
E: 30.6
5.4 x 20 = 108

NH4: ND - 0.07

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

* pooled H2O chems — 9/17/11

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM D.5
Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982
Sample ID: ERM 0.5 Concentration: 100%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/11/2011	M F U	D A	EB	8/10/2011	M F U	D A	DS	8/7/2011	M F U	D A	NW	8/12/2011	M F U	D A	KN
2	8/17/2011	M F U	D A	EB	8/20/2011	M F U	D A	NW	8/13/2011	M F U	D A	DS	8/15/2011	M F U	D A	EB
3	8/20/2011	M F U	D A	NW	8/22/2011	M F U	D A	KN	8/15/2011	M F U	D A partially emerged	MLL	8/15/2011	M F U	D A	TB
4	8/23/2011	M F U	D A	TB	8/23/2011	M F U	D A	KN	8/25/2011	M F U	D A	DS	8/16/2011	M F U	D A	DS
5	8/24/2011	M F U	D A	AD	8/28/2011	M F U	D A	DS	8/25/2011	M F U	D A	DS	8/18/2011	M F U	D A	NW
6	8/25/2011	M F U	D A	DS	8/29/2011	M F U	D A	NW	8/26/2011	M F U	D A	NW	8/27/2011	M F U	D A PARTIALLY EMURGED	AD
7	8/27/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS	8/27/2011	M F U	D A	DS	9/1/2011 AD 9/22/11	M F U	D A	AD
8	8/28/2011	M F U	D A	DS	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		9/5/2011	M F U	D A	AS
9	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
10	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
11	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~		~~/ /2011~~	~~M F U~~	~~D A~~	

Replicate 3	Replicate 4	Replicate 5	Replicate 6
Number fully emerged live midges: 8	Number fully emerged live midges: 7	Number fully emerged live midges: 6	Number fully emerged live midges: 6
Number dead or partially emerged midges: Ø	Number dead or partially emerged midges: Ø	Number dead or partially emerged midges: 1	Number dead or partially emerged midges: 2
Number of live pupae at test termination: Ø	Number of live pupae at test termination: Ø	Number of live pupae at test termination: Ø	Number of live pupae at test termination: Ø
Total number alive pupae and midge: 8	Total number alive pupae and midge: 7	Total number alive pupae and midge: 6	Total number alive pupae and midge: 6
20 Day Survival Rep 1 - 12/12	20 Day Survival Rep 2 - 12/12	20 Day Survival Rep 9 - 12/12	20 Day Survival Rep 12 - ___/12 7+2 pupae/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 0.5
Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8982
Sample ID: ERM 0.5 Concentration: 100%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials
1	8/11/2011	M F U	D A	CB	8/4/2011	M F U	D A	KN	8/11/2011	M F U	D A	MW	8/18/2011	M F U	D A	MW
2	8/13/2011	M F U	D A	KN	8/11/2011	M F U	D A	CB	8/13/2011	M F U	D A	DS	8/24/2011	M F U	D A	AD
3	8/14/2011	M F U	D A	KN	8/14/2011	M F U	D A	AD	8/14/2011	M F U	D A	MLL	8/25/2011	M F U	D A	MW
4	8/17/2011	M F U	D A	KN	8/20/2011	M F U	D A	MW	8/14/2011	M F U	D A	MLL	8/26/2011	M F U	D A	MW
5	8/19/2011	M F U	D A	AD	8/22/2011	M F U	D A	DS	8/16/2011	M F U	D A	DS	9/4/2011	M F U	D A	MW
6	8/21/2011	M F U	D A	KN	/2011	M F U	D A		8/21/2011	M F U	D A	KN	/2011	M F U	D A	
7	8/27/2011	M F U	D A	AD	/2011	M F U	D A		8/25/2011	M F U	D A	DS	/2011	M F U	D A	
8	9/1/2011	M F U	D A	AD	/2011	M F U	D A		9/7/2011	M F U	D A	DS	/2011	M F U	D A	
9	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
10	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

	Replicate 7	Replicate 8	Replicate 10	Replicate 11
Number fully emerged live midges	3	5	8	3
Number dead or partially emerged midges	5	0	0	2
Number of live pupae at test termination	0	0	0	0
Total number alive pupae and midge	3	5	8	3

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049 59 mw 9/7/11

Number Daily Renewals: 1

☒ Gomer Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 510 mw chemistries time/Initial take down

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials mw
Meter ID	40	6	
1	—	—	Ø
2	—	—	Ø
3			
4			
5	—	—	Ø
6	—	—	Ø
7	23.3	4.0	Ø
8			
9			
10			
11			
12	23.2	3.9	Ø

NH4: ND 0.03

#4 #13

pH SC

7.56 250.6

7.49 256.2

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049

Number Daily Renewals:

☐ Renewal time/initials ☐ Renewal

☐ Renewal time/initials ☐ Renewal

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials
Meter ID			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

AB

	End mL	Start mL	mL used	
Hardness	16.6	13.4	3.2 ~~3.4~~ AB 9/3	128
Alk	39.3	34.3	5.0	100

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 10%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8.
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	MW	8/5/2011	M F U	D A	MW	8/10/2011	M F U	D A	DS	8/3/2011	M F U	D A	
2	8/5/2011	M F U	D A	DR	8/5/2011	M F U	D A	MW	8/12/2011	M F U	D A	MW	8/5/2011	M F U	D A	MW
3	8/6/2011	M F U	D A	MW	8/9/2011	M F U	D A	DS	8/13/2011	M F U	D A	MW	8/8/2011	M F U	D A	KN
4	8/9/2011	M F U	D A	SAM	8/11/2011	M F U	D A	CB	8/15/2011	M F U	D A	MLL	8/8/2011	M F U	D A	MLL
5	8/12/2011	M F U	D A	TB	8/13/2011	M F U	D A	DS	8/18/2011	M F U	D A	DR	8/13/2011	M F U	D A	DS
6	8/16/2011	M F U	D A	DS	8/13/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW	8/14/2011	M F U	D A	MLL
7	8/20/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW	8/21/2011	M F U	D A	KN	8/15/2011	M F U	D A	CB
8	8/21/2011	M F U	D A	KN	8/21/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS	8/17/2011	M F U	D A	DS
9	8/21/2011	M F U	D A	KN	8/21/2011	M F U	D A	KN	8/29/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS
10	8/22/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS	8/30/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS
11	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	
12	~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~		~~/2011~~	~~M F U~~	~~D A~~	

	Replicate 1	Replicate 2	Replicate 5	Replicate 6
Number fully emerged live midges	8	10	10	10
Number dead or partially emerged midges	2	0	0	0
Number of live pupae at test termination	0	0	0	0
Total number alive pupae and midge	8	10	10	10
20 Day Survival Rep	3 - 10/12	4 - 12/12	9 - 11/12	11 - 12/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

20 day survival rep 8 10+1 midge/12
↓
tech error: 5 reps taken down
MW 9/27/11

QC'd by: MLL

Sample ID: ERm 1.0
Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERm 1.0 Concentration: 10%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate ____ Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	DS	8/5/2011	M F U	D A	MW	/ /2011	M F U	D A		8/4/2011	M F U	D A	KN
2	8/5/2011	M F U	D A	DR	8/5/2011	M F U	D A	DR	/ /2011	M F U	D A		8/11/2011	M F U	D A	EB
3	8/6/2011	M F U	D A	MW	8/5/2011	M F U	D A	DR	/ /2011	M F U	D A		8/11/2011	M F U	D A	EB
4	8/9/2011	M F U	D A	DS	8/10/2011	M F U	D A	AD	/ /2011	M F U	D A		8/12/2011	M F U	D A	KN
5	8/13/2011	M F U	D A	DS	8/11/2011	M F U	D A INCOMPLETE	KN	/ /2011	M F U	D A		8/13/2011	M F U	D A	MW
6	8/15/2011	M F U	D A	MLL	8/14/2011	M F U	D A	MLL	/ /2011	M F U	D A		8/13/2011	M F U	D A	MW
7	8/16/2011 DS 8/16	M F U	D A	DS	8/14/2011	M F U	D A	MLL	/ /2011	M F U	D A		8/19/2011	M F U	D A	DS
8	8/19/2011	M F U	D A	DS	8/15/2011	M F U	D A	MLL	/ /2011	M F U	D A		8/23/2011	M F U	D A	KN
9	8/19/2011	M F U	D A	AD	8/15/2011	M F U	D A	SAM	/ /2011	M F U	D A		8/26/2011	M F U	D A	MW
10	~~/ /2011~~	~~M F U~~	~~D A~~		8/20/2011	M F U	D A	MW	/ /2011	M F U	D A		8/30/2011	M F U	D A	MW
11	~~/ /2011~~	~~M F U~~	~~D A~~		8/22/2011	M F U	D A	DS	/ /2011	M F U	D A		~~/ /2011~~	~~M F U~~	~~D A~~	
12	~~/ /2011~~	~~M F U~~	~~D A~~		8/26/2011	M F U	D A	MW	/ /2011	M F U	D A		~~/ /2011~~	~~M F U~~	~~D A~~	
	Number fully emerged live midges 9				Number fully emerged live midges 11				Number fully emerged live midges ____				Number fully emerged live midges 9			
	Number dead or partially emerged midges 0				Number dead or partially emerged midges 1				Number dead or partially emerged midges ____				Number dead or partially emerged midges 1			
	Number of live pupae at test termination 0				Number of live pupae at test termination Ø				Number of live pupae at test termination ____				Number of live pupae at test termination Ø			
	Total number alive pupae and midge 9				Total number alive pupae and midge 11				Total number alive pupae and midge ____				Total number alive pupae and midge 9			

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049 59 MW 9/1/11

Number Daily Renewals: 1

☒ (60) MW Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 570 MW chemistries time/Initial

Takedown

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials MW
Meter ID	40	6	
1	—	—	Ø
2			
3			
4			
5	—	—	Ø
6	—	—	Ø
7	—	—	Ø
8	—	—	Ø
9	—	—	1 pupae
10	23.1	4.7	Ø
11			
12	23.2	4.1	Ø

NH4: ND 0.02

#4 pH	#13 SC
7.49	261.1
7.51	259.4

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049

Number Daily Renewals:

☐ Renewal time/initials ☐ Renewal

☐ Renewal time/initials ☐ Renewal

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials _____
Meter ID			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

MW 9/1/11

AS

	end mL	start mL	mL used	
Hard	19.5	16.6	2.9	116
Alt.	7.7	2.7	5.0	100

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 1.0

Concentration: 20%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984

Sample ID: ERM 1.0 Concentration: 20%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	DP	8/5/2011	M F U	D A	MW	8/7/2011	M F U	D A	MW	8/5/2011	M F U	D A	MW
2	8/9/2011	M F U	D A	DS	8/7/2011	M F U	D A	MW	8/7/2011	M F U	D A	MW	8/9/2011	M F U	D A	DS
3	8/10/2011	M F U	D A	AD	8/7/2011	M F U	D A	AD	8/8/2011	M F U	D A	KN	8/12/2011	M F U	D A	MW
4	8/11/2011	M F U	D A	CB	8/10/2011	M F U	D A	DS	8/8/2011	M F U	D A	MLL	8/13/2011	M F U	D A	DS
5	8/14/2011	M F U	D A	MLL	8/10/2011	M F U	D A	AD	8/9/2011	M F U	D A	DS	8/18/2011	M F U	D A	MW
6	8/19/2011	M F U	D A	DS	8/11/2011	M F U	D A	CB	8/12/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS
7	8/20/2011	M F U	D A	MW	8/11/2011	M F U	D A	MLL	8/13/2011	M F U	D A	DS	8/21/2011	M F U	D A	TB
8	8/20/2011	M F U	D A	MW	8/13/2011	M F U	D A	DS	8/13/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS
9	8/25/2011	M F U	D A	KB	8/20/2011	M F U	D A	MW	8/~~14~~ 15/2011 8/15/11 MLL	M F U	D A	MLL	8/26/2011	M F U	D A	MW
10	/2011	M F U	D A		8/21/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS	/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

Replicate 1	Replicate 5	Replicate 6	Replicate 7
Number fully emerged live midges 9	Number fully emerged live midges 10	Number fully emerged live midges 10	Number fully emerged live midges 8
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 9	Total number alive pupae and midge 10	Total number alive pupae and midge 10	Total number alive pupae and midge 8
20 Day Survival Rep 2 - 10/12	20 Day Survival Rep 3 - 12/12	20 Day Survival Rep 4 - /12 11+1 midge/12	20 Day Survival Rep 11 - 12/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 10
Concentration: 20%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/6/2011	M F U	D A	new	8/5/2011	M F U	D A	new	8/6/2011	M F U	D A	new	8/5/2011	M F U	D A	new
2	8/8/2011	M F U	D A	KN	8/6/2011	M F U	D A	new	8/8/2011	M F U	D A	DS	8/6/2011	M F U	D A	new
3	8/9/2011	M F U	D A	SAM	8/7/2011	M F U	D A	new	8/10/2011	M F U	D A	DS	8/11/2011	M F U	D A	KN
4	8/18/2011	M F U	D A	new	8/17/2011	M F U	D A	new	8/18/2011	M F U	D A	new	8/12/2011	M F U	D A	new
5	8/19/2011	M F U	D A	DS	8/13/2011	M F U	D A	DS	8/18/2011	M F U	D A	DR	8/14/2011	M F U	D A	MLL
6	8/19/2011	M F U	D A	DS	8/14/2011	M F U	D A	MLL	8/19/2011	M F U	D A	DS	8/14/2011	M F U	D A	MLL
7	8/25/2011	M F U	D A	new	8/14/2011	M F U	D A	AD	8/25/2011	M F U	D A	new	8/16/2011	M F U	D A	DS
8	8/29/2011 Rmr 8/24/11	M F U	D A	new	8/15/2011	M F U	D A	MLL	8/26/2011	M F U	D A	new	8/19/2011	M F U	D A	DS
9	/ /2011	M F U	D A		8/19/2011	M F U	D A	new	8/30/2011	M F U	D A part emerge	new	8/20/2011	M F U	D A	new
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		8/24/2011	M F U	D A	DS
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

	Replicate 8	Replicate 9	Replicate 10	Replicate 12
Number fully emerged live midges	7	9	8	10
Number dead or partially emerged midges	1	Ø	1	Ø
Number of live pupae at test termination	Ø	1	Ø	Ø
Total number alive pupae and midge	7	10	8	10

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049 59 nw 9/7/11

Number Daily Renewals: 2

1600 nw Renewal time/initials — Renewal time/initials

1743 EB Renewal time/initials — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 071 ✓ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ✓ no ☐ n/a

1510 nw chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AS NAV AS 9/21/11
Meter ID	40	6	
1	—	—	NAV
2			
3			
4	—	—	NAV
5	—	—	↓
6	—	—	↓
7	—	—	↓
8	—	—	↓
9			
10	23.1	3.4	NAV
11			
12	23.1	3.9	NAV

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049 59 nw 9/7/11

Number Daily Renewals: 1

1612 nw Renewal time/initials ☐ — Renewal

☐ — Renewal time/initials ☐ — Renewal

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ✓ no ☐ n/a —

1509 nw chemistries time/Initial

Take down

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials nw
Meter ID	40	6	
1	22.9	3.1	Ø
2			
3			
4	22.8	3.1	Ø
5	—	—	Ø
6	—	—	Ø
7	—	—	Ø
8	—	—	Ø
9			
10	—	—	Ø
11			
12	—	—	Ø

NH4 dup: ND ~2.04

NH4: ND ~2.04

#4 pH	#113 SC
7.63	271.6
7.60	287.8

AS

	End mL	Start mL	mL used	
Hard	9.7	6.1	3.6	144
AK	29.7	24.3	5.4	108
Duplicate				
Hard	13.2	9.7	3.5	140
AK	34.9	29.7	5.2	104

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 40%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 40%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	MW	8/11/2011	M F U	D A	MW	08/06/2011	M F U	D A	AD	8/9/2011	M F U	D A	TB
2	8/8/2011	M F U	D A	MLL	8/18/2011	M F U	D A	MW	8/10/2011	M F U	D A	AD	8/15/2011	M F U	D A	MLL
3	8/12/2011	M F U	D A	TB	8/20/2011	M F U	D A	MW	8/12/2011	M F U	D A	TB	8/16/2011	M F U	D A	DS
4	8/14/2011	M F U	D A	MLL	8/20/2011	M F U	D A	MW	8/12/2011	M F U	D A	TB	8/18/2011	M F U	D A	DR
5	8/15/2011	M F U	D A	MLL	8/21/2011	M F U	D A	KN	8/17/2011	M F U	D A	DS	8/20/2011	M F U	D A	MW
6	8/15/2011	M F U	D A	TB	8/23/2011	M F U	D A	KN	8/19/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN
7	8/20/2011	M F U	D A	MW	8/26/2011	M F U	D A	MW	8/22/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN
8	8/25/2011	M F U	D A	MW	8/29/2011	M F U	D A	MW	8/23/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS
9	/ /2011	M F U	D A		/ /2011	M F U	D A		8/26/2011	M F U	D A	MW	8/22/2011	M F U	D A	KN
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 1	Replicate 4	Replicate 5	Replicate 6
Number fully emerged live midges 8	Number fully emerged live midges 8	Number fully emerged live midges 8	Number fully emerged live midges ~~8~~ 8
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1	Number dead or partially emerged midges 1
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 8	Total number alive pupae and midge 8	Total number alive pupae and midge 8	Total number alive pupae and midge 8
20 Day Survival Rep 2 - 12/12	20 Day Survival Rep 3 - 12/12	20 Day Survival Rep 9 - /12 10+1 pupae + 1 midge/12	20 Day Survival Rep 11 - 12/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 40%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 40%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	SAM	8/11/2011	M F U	D A	NW	8/8/2011	M F U	D A	KN	8/5/2011	M F U	D A	DR
2	8/4/2011	M F U	D A	MLL	8/18/2011	M F U	D A	NW	8/8/2011	M F U	D A	DS	8/8/2011	M F U	D A	MLL
3	8/4/2011	M F U	D A	NW	8/18/2011	M F U	D A	NW	8/9/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS
4	8/11/2011	M F U	D A	CB	8/20/2011	M F U	D A	NW	8/14/2011	M F U	D A	KN	8/11/2011	M F U	D A	NW
5	8/11/2011	M F U	D A	MLL	8/22/2011	M F U	D A	DS	8/17/2011	M F U	D A	KN	8/12/2011	M F U	D A	NW
6	8/17/2011	M F U	D A	DS	8/23/2011	M F U	D A	KN	8/18/2011	M F U	D A	DR	8/12/2011	M F U	D A	NW
7	8/19/2011	M F U	D A	DS	8/25/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/19/2011	M F U	D A	NW
8	8/20/2011	M F U	D A	NW	8/27/2011	M F U	D A	DS	8/24/2011	M F U	D A	DS	8/19/2011	M F U	D A	AD
9	8/21/2011	M F U	D A	KN	8/31/2011	M F U	D A	DS	8/28/2011	M F U	D A	DS	8/29/2011	M F U	D A	NW
10	8/27/2011	M F U	D A	DS	/ /2011	M F U	D A		8/28/2011	M F U	D A	DS	/ /2011	M F U	D A	
11	8/28/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	~~/ /2011~~	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 7	Replicate 8	Replicate 10	Replicate 12
Number fully emerged live midges 11	Number fully emerged live midges 9	Number fully emerged live midges 8	Number fully emerged live midges 9
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 2	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 11	Total number alive pupae and midge 9	Total number alive pupae and midge 8	Total number alive pupae and midge 9

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: ~~NA~~ 60% DS 9/8/11

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 55	Number Daily Renewals: ~~2~~ 1 9/15/11 MLL
Date: 9/08/2011	~~X~~DS 8:26 renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water: Dechlor (Glec Laboratory Water)	☐ ——— renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water Batch ID (GLC Number): NA	Food: (Tetrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate
✓ 1145 AB chemistries time/Initial	Screens Cleaned: ☐ yes ☐ no ☑ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ ~~10~~ 12 organisms per replicate 9/8/11
Record Meter ID	40	4	6	113	AB 9/8/11 ~~120~~	AB 9/9/11 ~~98~~ 4	8	Int: nw
1	—	—	—	—	—	—	ND -0.01	—
2	22.9	7.49	3.5	257.0	120	98	—	Ø
3	23.0	7.52	4.8	253.6	—	—	—	~~Ø~~ 1 9/8/11
4	—	—	—	~~7~~ AS 9/9/11	—	—	—	Ø
5	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	Ø
7	—	—	—	—	—	—	—	Ø
8	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	Ø
10	—	—	—	—	—	—	—	—
11	—	—	—	—	—	—	—	Ø
12	—	—	—	—	—	—	—	1

	Alk.	Hard.
End mL	14.8	48.6
Start mL	9.9	45.6
	4.9	3.0

~~Alk~~

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

Relative % Difference: RPD ≤15%

$$RPD = \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \times 100 =$$

Ammonia Reporting Limits:

RL = Reporting Limit (0.10 mg/L).
MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10.
J = ≥ MDL and < RL.
U = Below MDL.

Observation Key:

AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 60%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 60%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F (U)	(D) A	SAM	8/14/2011	(M) F U	D (A)	MLL	8/18/2011	(M) F U	D (A)	MW	8/3/2011	M F U	(D) A	DS
2	8/4/2011	(M) F U	D (A)	MW	8/16/2011	M F (U)	D (A)	AP	8/18/2011	(M) F U	D (A)	MW	8/5/2011	(M) F U	D (A)	DR
3	8/7/2011	(M) F U	D (A)	MW	8/17/2011	M (F) U	D (A)	DS	8/20/2011	(M) F U	D (A)	MW	8/12/2011	(M) F U	D (A)	MW
4	8/9/2011	(M) F U	D (A)	DS	8/20/2011	(M) F U	D (A)	MW	8/20/2011	M (F) U	D (A)	MW	8/12/2011	M F (U)	D (A)	TB
5	8/16/2011	M (F) U	D (A)	DS	8/22/2011	(M) F U	D (A)	DS	8/21/2011	M (F) U	D (A)	KN	8/13/2011	(M) F U	D (A)	MW
6	8/17/2011	(M) F U	D (A)	DS	8/23/2011	M (F) U	D (A)	KN	8/22/2011	M (F) U	D (A)	DS	8/15/2011	M (F) U	D (A)	MLL
7	8/17/2011	M (F) U	D (A)	DS	8/26/2011	(M) F U	(D) A	MW	8/29/2011	(M) F U	(D) A	MW	8/17/2011	M (F) U	D (A)	DS
8	8/19/2011	(M) F U	D (A)	DS	8/31/2011	M (F) U	D (A)	DS	/ /2011	M F U	D A		8/18/2011	(M) F U	D (A)	MW
9	/ /2011	M F U	D A		9/1/2011	M (F) U	(D) A	AP	/ /2011	M F U	D A		8/22/2011	M (F) U	(D) A	DS
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		~~8/24/2011~~	~~M (F) U~~	~~D (A)~~	AS
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

8/24 AS - noted in wrong GLC# - see 8986 for correct

	Rep 2	Rep 3	Rep 4	Rep 6
Number fully emerged live midges	7	7	6	7
Number dead or partially emerged midges	1	2	1	2
Number of live pupae at test termination	Ø	1	Ø	Ø
Total number alive pupae and midge	MW 9/17/11 Ø7	MW 9/17/11 ~~Ø~~ 8	MW 9/17/11 ~~Ø~~ 6	MW 9/17/11 Ø7
20 Day Survival	Rep 1 - ___/12 7+1 pupae/12	Rep 5 - 12/12	Rep 8 - 12/12	Rep 10 - ___/12 9+2 midges/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 60%

TVA: 5069-03
Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 60%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/6/2011	M F U	D A	new	8/8/2011	M F U	D A	CB	8/12/2011	M F U	D A	new	8/6/2011	M F U	D A	new
2	8/7/2011	M F U	D A	new	8/8/2011	M F U	D A	MLL	8/12/2011	M F U	D A	CB	8/12/2011	M F U	D A	new
3	8/12/2011	M F U	D A	new	8/12/2011	M F U	D A	KN	8/12/2011	M F U	D A	TB	8/13/2011	M F U	D A	KN
4	8/16/2011	M F U	D A	DS	8/13/2011	M F U	D A	new	8/13/2011	M F U	D A	KN	8/16/2011	M F U	D A	DS
5	8/16/2011	M F U	D A	DS	8/14/2011	M F U	D A	AD	8/15/2011	M F U	D A	MLL	8/18/2011	M F U	D A	new
6	8/16/2011	M F U	D A	DS	8/16/2011	M F U	D A	DS	8/16/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS
7	8/17/2011	M F U	D A	DS	8/18/2011	M F U	D A	DR	8/17/2011	M F U	D A	DS	8/20/2011	M F U	D A	new
8	8/20/2011	M F U	D A	new	8/19/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/20/2011	M F U	D A	new
9	/ /2011	M F U	D A		8/21/2011	M F U	D A	KN	8/27/2011	M F U	D A	DS	9/4/2011	M F U	D A	new
10	/ /2011	M F U	D A		8/22/2011	M F U	D A	DS	9/4/2011	M F U	D A	new	/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 7	Replicate 9	Replicate 11	Replicate 12
Number fully emerged live midges 8	Number fully emerged live midges 10	Number fully emerged live midges 9	Number fully emerged live midges 9
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination 1
Total number alive pupae and midge ~~Ø~~ 8 new 9/17/11	Total number alive pupae and midge ~~Ø~~ 10 new 9/17/11	Total number alive pupae and midge ~~Ø~~ 9 new 9/17/11	Total number alive pupae and midge 10

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 53 Date: 9/06/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9059

Number Daily Renewals: 2

☒ 0615 MLL Renewal time/initials ☒ 1715 MD Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 074 AD ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1430 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	6	
1			
2	23.0	3.4	~~Fungi~~ growth on sed AD 9/6/11 BHV NAV
3			
4	—	—	~~Fungi~~ growth on sed AD 9/6/11 BHV NAV
5	—	—	
6	—	—	BHV
7			
8			
9	23.0	4.0	BHV NAV
10	—	—	
11	—	—	
12	—	—	

Test Day: Day 54 Date: 9/07/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number):

Number Daily Renewals: 0

☐ — Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1516 AB chemistries time/Initial* Chems from composite sample

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials NW
Meter ID	40	4	6	
1				
2	—	—	—	Ø
3				
4	22.3	7.77	6.3	Ø
5	—	—	—	Ø
6	—	—	—	Ø
7				
8				
9	—	—	—	Ø
10	—	—	—	Ø
11	—	—	—	Ø
12	—	—	—	Ø

	end mL	start mL	mL used	
Hard	24.5	21.5	3.0	120
Alk	17.4	12.3 ~~7.7~~ AB 9/11	5.1	102

S.C. 264.3

NH4: ND 0.04

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/16/2011	M (F) U	D (A)	DS	8/4/2011	(M) F U	D (A)	DS	8/8/2011	(M) F U	D (A)	DS	8/8/2011	(M) F U	D (A)	KN
2	8/18/2011	(M) F U	D (A)	[illegible]	08/06/2011	(M) F U	D (A)	AD	8/19/2011	(M) F U	D (A)	[illegible]	8/9/2011	M (F) U	(D) A	TB
3	8/19/2011	(M) F U	D (A)	DS	8/10/2011	M (F) U	D (A)	SAM	8/19/2011	M (F) U	D (A)	DS	8/14/2011	(M) F U	D (A)	KN
4	8/19/2011	(M) F U	D (A)	DS	8/14/2011	M (F) U	(D) A	KN	8/19/2011	(M) F U	D (A)	AD	8/23/2011	(M) F U	D (A)	KN
5	8/19/2011	M (F) U	D (A)	DS	8/16/2011	M (F) U	D (A)	DS	8/31/2011	M (F) U	D (A)	DS	8/26/2011	(M) F U	(D) A	[illegible]
6	8/26/2011	M (F) U	(D) A	[illegible]	/ /2011	M F U	D A		/ /2011	M F U	D A		8/27/2011	M F (U)	(D) A	DS
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		8/31/2011	M (F) U	D (A)	DS
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 2	Replicate 4	Replicate 5	Replicate 6
Number fully emerged live midges 5	Number fully emerged live midges 4	Number fully emerged live midges 5	Number fully emerged live midges 4
Number dead or partially emerged midges 1	Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 3
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 5	Total number alive pupae and midge 4	Total number alive pupae and midge 5	Total number alive pupae and midge 4
20 Day Survival Rep 1 - 12 /12	20 Day Survival Rep 3 - 12 /12	20 Day Survival Rep 7 - 11 /12	20 Day Survival Rep 8 - 12 /12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8934
Sample ID: ERM 1.0 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/12/2011	M F U	D A	MW	8/11/2011	M F U	D A	EB	8/8/2011	M F U	D A	KN	8/7/2011	M F U	D A	AD
2	8/13/2011	M F U	D A	KN	8/12/2011	M F U	D A	MW	8/15/2011	M F U	D A	MLL	8/7/2011	M F U	D A	AD
3	8/15/2011	M F U	D A	MLL	8/12/2011	M F U	D A	KN	8/16/2011	M F U	D A	DS	8/8/2011	M F U	D A	KN
4	8/26/2011	M F U	D A	MW	8/17/2011	M F U	D A	DS	8/26/2011	M F U	D A	MW	8/13/2011	M F U	D A	DR
5	8/29/2011	M F U	D A	MW	/ /2011	M F U	D A		9/3/2011	M F U	D A	MW	8/19/2011	M F U	D A	DS
6	8/30/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		8/19/2011	M F U	D A	DS
7	8/31/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		8/21/2011	M F U	D A	KN
8	9/1/2011	M F U	D A	AD	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	9/2/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

	Replicate 9	Replicate 10	Replicate 11	Replicate 12
Number fully emerged live midges	8	3	3	7
Number dead or partially emerged midges	1	1	2	0
Number of live pupae at test termination	0	0	0	0
Total number alive pupae and midge	8	3	3	7

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 57 Date: 9/10/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals: 2

☒ 0700 AD Renewal time/initials ☒ 1800 AD Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 074 AD ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1230 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	6	
1	—	—	NAV BHV
2	22.6	4.5	
3	22.7	4.5	
4			
5	—	—	NAV BHV
6	—	—	
7			
8			
9			
10	—	—	NAV BHV
11	—	—	
12	—	—	

Test Day: Day 58 Date: 9/11/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals: 2 | MLL 9/12/11

☒ 0700 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1100 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials AD	
Meter ID	40	4	6		
1	—	—	—	NAV Ø	
2	—	—	—	Ø	
3 *	23.1	7.86	6.7	Ø	SC: 262
4					
5	22.7	7.57	3.4	NAV Ø	SC: 257
6	22.7	7.77	4.1	Ø	SC: 267
7					
8					
9					
10	—	—	—	NAV Ø	
11	—	—	—	Ø	
12	—	—	—	Ø	

HARD
S: 28.7
E: 31.6
2.9 x 40
= 116

ALK
S: 30.6
E: 36.0
5.4 x 20
= 108

NH_4: ND
-0.06

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

* POOLED H_2O

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 100%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/9/2011	M F U	D A	MLL	8/17/2011	M F U	D A	DS	8/6/2011	M F U	D A	mw	8/18/2011	M F U	D A	mw
2	8/10/2011	M F U	D A	DS	8/19/2011	M F U	D A	DS	8/12/2011	M F U	D A	CB	8/20/2011	M F U	D A	mw
3	8/12/2011	M F U	D A	mw	8/19/2011	M F U	D A	DS	8/26/2011	M F U	D A	mw	8/26/2011	M F U	D A	mw
4	8/14/2011	M F U	D A	MLL	8/21/2011	M F U	D A	KN	9/3/2011	M F U	D A	mw	8/29/2011	M F U	D A	mw
5	8/15/2011	M F U	D A	SAM	8/23/2011	M F U	D A	KN	9/4/2011	M F U	D A	mw	8/31/2011	M F U	D A	DS
6	8/20/2011	M F U	D A	mw	8/23/2011	M F U	D A	KN	/ /2011	M F U	D A		/ /2011	M F U	D A	
7	9/7/2011	M F U	D A	AS	8/31/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A	
8	/ /2011	M F U	D A		8/31/2011	M F U	D A	CB	/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 1	Replicate 2	Replicate 3	Replicate 5
Number fully emerged live midges 6	Number fully emerged live midges 8	Number fully emerged live midges 3	Number fully emerged live midges 5
Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 2	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 6	Total number alive pupae and midge 8	Total number alive pupae and midge 3	Total number alive pupae and midge 5
20 Day Survival Rep 4 - 12/12	20 Day Survival Rep 7 - 12/12	20 Day Survival Rep 8 - 11/12	20 Day Survival Rep 9 - 9/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 1.0
Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 100%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/10/2011	M F U	D A	DJ	8/7/2011	M F U	D A	MW	8/9/2011	M F U	D A	TB	8/10/2011	M F U	D A	DJ
2	8/10/2011	M F U	D A	DJ	8/13/2011	M F U	D A	MW	8/14/2011	M F U	D A	KN	8/22/2011	M F U	D A	DJ
3	8/18/2011	M F U	D A	DR	8/16/2011	M F U	D A	DJ	8/20/2011	M F U	D A	MW	8/29/2011	M F U	D A	MW
4	8/19/2011	M F U	D A	AD	8/24/2011	M F U	D A	AB	8/21/2011	M F U	D A	KN	8/30/2011	M F U	D A	DJ
5	8/29/2011	M F U	D A	DJ	/ /2011	M F U	D A		8/29/2011	M F U	D A partially emerged	MLL	/ /2011	M F U	D A	
6	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
Number fully emerged live midges	5				3				3				4			
Number dead or partially emerged midges	Ø				1				2				Ø			
Number of live pupae at test termination	Ø				Ø				Ø				Ø			
Total number alive pupae and midge	5				3				3				4			

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049 9/1/11

Number Daily Renewals: 1

~~10:40~~ Renewal time/initials □ — Renewal time/initials

□ 05 9/3/11 Renewal time/initials □ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — □ Feed 1.5 ml/replicate

Screens Cleaned: □ yes ☒ no □ n/a

☒ 5:10 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials
Meter ID	40	6	
1	—	—	Ø
2	—	—	2
3	—	—	Ø
4	—	—	Ø
5	—	—	Ø
6			
7	—	—	Ø
8	22.9	4.6	Ø
9			
10	22.8	4.4	2
11			
12			

NH4: ND 0.03

#4 DH	#13 SC
7.48	253.9
7.52	253.4

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049

Number Daily Renewals:

□ Renewal time/initials □ Renewal

□ Renewal time/initials □ Renewal

Food: (Tertrafin 4g/L) TFS# □ Feed 1.5 ml/replicate

Screens Cleaned: □ yes □ no □ n/a

□ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials
Meter ID			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

9/3/11

AS

	end mL	start mL	mL used	
Hard	25.7	22.6	3.1	124
Alk.	12.7	7.7	5.0	100

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 10%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	NW	8/10/2011	M F U	D A	DJ	08/04/2011	M F U	D A	AD	8/12/2011	M F U	D A	NW
2	8/12/2011	M F U	D A	NW	8/10/2011	M F U	D A	AD	8/6/2011	M F U	D A	NW	8/15/2011	M F U	D A	SM
3	8/13/2011	M F U	D A	DJ	8/12/2011	M F U	D A	NW	8/10/2011	M F U	D A	DJ	8/16/2011	M F U	D A	DJ
4	8/13/2011	M F U	D A	NW	8/17/2011	M F U	D A	DJ	8/12/2011	M F U	D A	TB	8/18/2011	M F U	D A	DR
5	8/14/2011	M F U	D A	MLL	8/19/2011	M F U	D A	DJ	8/13/2011	M F U	D A	DJ	8/19/2011	M F U	D A	NW
6	8/15/2011	M F U	D A	TB	8/20/2011	M F U	D A	NW	8/17/2011	M F U	D A	DJ	8/24/2011	M F U	D A	AD
7 *	~~8/5/2011~~ 8/15/11	M F ~~U~~ 8/15/11	~~D~~ D A ~~D~~ 8/15/11	~~EB~~ 8/15/11	8/21/2011	M F U	D A	KN	8/18/2011	M F U	D A	NW	8/26/2011	M F U	D A	NW
8	8/17/2011	M F U	D A	DJ	8/23/2011	M F U	D A	KN	8/24/2011	M F U	D A	AD	8/27/2011	M F U	D A	DJ
9	8/21/2011	M F U	D A	KN	/ /2011	M F U	D A		8/26/2011	M F U	D A	NW	8/30/2011	M F U	D A	DJ
10	8/21/2011	M F U	D A	KN	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	8/24/2011	M F U	D A	AD	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	~~/ /2011~~	~~M F U~~	~~D A~~		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 1	Replicate 2	Replicate 3	Replicate 4
Number fully emerged live midges: 8	Number fully emerged live midges: 8	Number fully emerged live midges: 9	Number fully emerged live midges: 8
Number dead or partially emerged midges: ~~12~~ NW 9/3/11	Number dead or partially emerged midges: Ø	Number dead or partially emerged midges: Ø	Number dead or partially emerged midges: 1
Number of live pupae at test termination: Ø	Number of live pupae at test termination: 2	Number of live pupae at test termination: Ø	Number of live pupae at test termination: Ø
Total number alive pupae and midge: 8	Total number alive pupae and midge: 10	Total number alive pupae and midge: 9	Total number alive pupae and midge: 8
20 Day Survival Rep 6 - ____/12 10+1 pupae/12	20 Day Survival Rep 9 - 11 /12	20 Day Survival Rep 11 - ____/12 8+3 pupae/12	20 Day Survival Rep 12 - ____/12 10+1 pupae/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM2.5
Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 10%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials
1	8/10/2011	M F U	D A	DS	8/5/2011	M F U	D A	EB	8/4/2011	M F U	D A	KN	8/7/2011	M F U	D A	MLL
2	8/10/2011	M F U	D A	DS	8/5/2011	M F U	D A	DR	8/9/2011	M F U	D A	AD	8/7/2011	M F U	D A	MLL
3	8/11/2011	M F U	D A	EB	8/8/2011	M F U	D A	KN	8/11/2011	M F U	D A	EB	8/15/2011	M F U	D A	MLL
4	8/14/2011	M F U	D A	MLL	8/8/2011	M F U	D A	KN	8/11/2011	M F U	D A	EB	8/19/2011	M F U	D A	MLL
5	8/19/2011	M F U	D A	MLL	8/10/2011	M F U	D A	DS	8/12/2011	M F U	D A	KN	8/20/2011	M F U	D A	MLL
6	8/19/2011	M F U	D A	AD	8/18/2011	M F U	D A	MLL	8/15/2011	M F U	D A	MLL	8/23/2011	M F U	D A	KN
7	8/22/2011	M F U	D A	DS	8/20/2011	M F U	D A	MLL	8/19/2011	M F U	D A	DS	8/29/2011	M F U	D A	MLL
8	8/29/2011	M F U	D A	MLL	8/21/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS	/ /2011	M F U	D A	
9	/ /2011	M F U	D A		8/23/2011	M F U	D A	KN	8/26/2011	M F U	D A	MLL	/ /2011	M F U	D A	
10	/ /2011	M F U	D A		8/23/2011	M F U	D A	KN	/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		8/28/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

	Replicate 5	Replicate 7	Replicate 8	Replicate 10
Number fully emerged live midges	8	11	9	7
Number dead or partially emerged midges	Ø	Ø	Ø	Ø
Number of live pupae at test termination	Ø	Ø	Ø	2
Total number alive pupae and midge	8	11	9	9

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8985

Sample ID: ERM 2.5 Concentration: 20%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS <24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 53 Date: 9/06/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9059

Number Daily Renewals: 2

~~X~~ 0624 MLL Renewal time/initials X 1715 MD Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 074 AD ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1430 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	6	
1	22.7	3.7	BHV NAV
2			
3			
4	—	—	BHV NAV
5	—	—	
6	—	—	
7	22.8	4.3	
8	—	—	FOV
9	—	—	
10			
11	—	—	BHV NAV
12			

Test Day: Day 54 Date: 9/07/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number):

Number Daily Renewals: Ø

☐ — Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1516 AS chemistries time/Initial * chems from ~~composite~~ takedown sample

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials ~~AS~~ AS 9/7/11
Meter ID	40	4	6	
1	—	—	—	Ø AS 9/7/11 ~~NAV~~
2				
3				
* 4	22.1	7.70	6.2	~~BHV~~ AS 9/7/11 ~~NAV~~
5	—	—	—	Ø
6	—	—	—	Ø
7	—	—	—	Ø
8	—	—	—	Ø
9	—	—	—	~~BHV~~ AS 9/7/11 Ø
10				
11	—	—	—	Ø AS 9/7/11 ~~NAV~~
12				

	end mL	start mL	mL used	
Bud	18.5	15.5	3.0	120
AMF	41.4	36.3	5.1	102

S.C = 262.3

NH4: ND 0.01

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 20%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/8/2011	M F U	D A	KN	8/17/2011	M F U	D A	MLL	8/4/2011	M F U	D A	SAM	8/4/2011	M F U	D A	KN
2	8/17/2011	M F U	D A	MLL	8/14/2011	M F U	D A	MLL	8/9/2011	M F U	D A	AD	8/18/2011	M F U	D A	MLL
3	8/18/2011	M F U	D A	MLL	8/14/2011	M F U	D A	MLL	8/9/2011	M F U	D A	AD	8/19/2011	M F U	D A	MLL
4	8/18/2011	M F U	D A	AM	8/14/2011	M F U	D A	MLL	8/16/2011	M F U	D A	DJ	8/20/2011	M F U	D A	MLL
5	8/19/2011	M F U	D A	DJ	8/17/2011	M F U	D A	DJ	8/16/2011	M F U	D A	DJ	8/25/2011	M F U	D A	DJ
6	8/22/2011	M F U	D A	DJ	8/17/2011	M F U	D A	DJ	8/20/2011	M F U	D A	MLL	8/25/2011	M F U	D A	DJ
7	8/23/2011	M F U	D A	KN	8/19/2011	M F U	D A	DJ	8/22/2011	M F U	D A	DJ	8/25/2011	M F U	D A	MLL
8	8/26/2011	M F U	D A	MLL	8/25/2011	M F U	D A	AB	8/22/2011	M F U	D A	DJ	8/28/2011	M F U	D A	DJ
9	8/28/2011	M F U	D A	DJ	/ /2011	M F U	D A		8/23/2011	M F U	D A	KN	8/29/2011	M F U	D A	MLL
10	9/3/2011	M F U	D A	AB	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 1	Replicate 4	Replicate 5	Replicate 6
Number fully emerged live midges 10	Number fully emerged live midges 7	Number fully emerged live midges 9	Number fully emerged live midges 9
Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 10	Total number alive pupae and midge 7	Total number alive pupae and midge 9	Total number alive pupae and midge 9
20 Day Survival Rep 2 - 11 /12	20 Day Survival Rep 3 - 11 /12	20 Day Survival Rep 10 - 12 /12	20 Day Survival Rep 12 - 12 /12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 20%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 2.0%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	MLL	8/8/2011	M F U	D A	KN	8/4/2011	M F U	D A	KN	8/6/2011	M F U	D A	MLL
2	8/9/2011	M F U	D A	AD	8/9/2011	M F U	D A	AD	8/8/2011	M F U	D A	DS	8/8/2011	M F U	D A	KN
3	8/12/2011	M F U	D A	MLL	8/13/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS	8/11/2011	M F U	D A	EB
4	8/12/2011	M F U	D A	MLL	8/17/2011	M F U	D A	DS	8/15/2011	M F U	D A	SAM	8/12/2011	M F U	D A	MLL
5	8/14/2011	M F U	D A	MLL	8/19/2011	M F U	D A	MLL	8/19/2011	M F U	D A	DS	8/13/2011	M F U	D A	MLL
6	8/18/2011	M F U	D A	MLL	8/23/2011	M F U	D A	KN	8/20/2011	M F U	D A	TB	8/15/2011	M F U	D A	SAM
7	8/29/2011	M F U	D A	MLL	8/24/2011	M F U	D A	AD	8/29/2011	M F U	D A	MLL	8/17/2011	M F U	D A	KN
8	8/31/2011	M F U	D A	AD	8/28/2011	M F U	D A	DS	8/29/2011	M F U	D A	MLL	8/29/2011	M F U	D A	MLL
9	/2011	M F U	D A		9/3/2011	M F U	D A	EB	/2011	M F U	D A		/2011	M F U	D A	
10	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

	Replicate 7	Replicate 8	Replicate 9	Replicate 11
Number fully emerged live midges	7	9	5	5
Number dead or partially emerged midges	1	Ø	3	3
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	7	9	5	5

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: ~~NA~~ 40% AS 9/8/11

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 55	Number Daily Renewals: ~~2~~ 1 9/15/11 MLL
Date: 9/08/2011	XDS 6:26 renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water: Dechlor (Glec Laboratory Water)	☐ ——— renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water Batch ID (GLC Number): NA	Food: (Tetrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate
✓ 1145 AB chemistries time/Initial	Screens Cleaned: ☐ yes ☐ no ☑ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ ~~12~~ 10 organisms per replicate 9/15/11 MLL
Record Meter ID	40	4	6	113	AB ~~132~~ 9/9/11	AB ~~102~~ 4 9/9/11	8	Int: NW
1	—						ND-0.01	—
2	23.0	7.61	5.8	254.4	132	102	—	Ø
3	23.0	7.56	5.1	255.2	—	—	—	1
4	—							Ø
5	—							~~NW~~ 9/8/11
6	—							~~Ø~~ 9/8/11 NW
7	—							Ø
8	—							Ø
9	—							Ø
10	—							1
11	—							Ø
12	—							—

	Alk	Hard.
end mL	19.9	4.4
start mL	14.8	1.1
	5.1	3.3

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

Relative % Difference: RPD ≤15%	Ammonia Reporting Limits:	Observation Key:
RPD = $\frac{(s_1 - s_2)}{(s_1 + s_2)/2}$ x 100 =	RL = Reporting Limit (0.10 mg/L).	AV: Animals Visible
	MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10.	NAV: No Animals Visible
	J = ≥ MDL and < RL.	FOV: Foreign Organism Visible
	U = Below MDL.	

QC'd by: MLL

Sample ID: ERM 2.5

Concentration: 40%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985

Sample ID: ERM 2.5 Concentration: 40%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	KN	8/8/2011	M F U	D A	MLL	8/10/2011	M F U	D A	DS	8/8/2011	M F U	D A	KN
2	8/10/2011	M F U	D A	DS	8/12/2011	M F U	D A	NW	8/12/2011	M F U	D A	TB	8/10/2011	M F U	D A	MLL
3	8/11/2011	M F U	D A	NW	8/12/2011	M F U	D A	KN	8/12/2011	M F U	D A	TB	8/12/2011	M F U	D A	NW
4	8/15/2011	M F U	D A	MLL	8/17/2011	M F U	D A	LB	8/19/2011	M F U	D A	NW	8/12/2011	M F U	D A	NW
5	8/19/2011	M F U	D A	AD	8/19/2011	M F U	D A	AD	8/19/2011	M F U	D A	AD	8/14/2011	M F U	D A	MLL
6	8/22/2011	M F U	D A	DS	8/26/2011	M F U	D A	NW	8/23/2011	M F U	D A	KN	8/17/2011	M F U	D A	DS
7	8/29/2011	M F U	D A	NW	9/2/2011 (DS 9/8/11)	M F U	D A	DS	8/24/2011	M F U	D A	AD	8/19/2011	M F U	D A	DS
8	/2011	M F U	D A		9/4/2011	M F U	D A	NW	8/24/2011	M F U	D A	AD	8/22/2011	M F U	D A	DS
9	/2011	M F U	D A		/2011	M F U	D A		8/24/2011	M F U	D A	AD	8/24/2011	M F U	D A	AD
10	/2011	M F U	D A		/2011	M F U	D A		8/24/2011	M F U	D A	AD	8/25/2011	M F U	D A	DS
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		8/28/2011	M F U	D A	DS
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

Replicate 2	Replicate 3	Replicate 4	Replicate 7
Number fully emerged live midges: 6	Number fully emerged live midges: 8	Number fully emerged live midges: 10	Number fully emerged live midges: 11
Number dead or partially emerged midges: 1	Number dead or partially emerged midges: Ø	Number dead or partially emerged midges: Ø	Number dead or partially emerged midges: Ø
Number of live pupae at test termination: Ø	Number of live pupae at test termination: 1	Number of live pupae at test termination: Ø	Number of live pupae at test termination: Ø
Total number alive pupae and midge: Ø 6 (NW 9/17/11)	Total number alive pupae and midge: 9	Total number alive pupae and midge: Ø 10 (NW 9/17/11)	Total number alive pupae and midge: Ø 11 (NW 9/17/11)
20 Day Survival Rep 1 - 12/12	20 Day Survival Rep 5 - 12/12	20 Day Survival Rep 6 - ___/12 10+1 pupae/12	20 Day Survival Rep 12 - ___/12 9+1 pupae/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 40%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 40%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials
1	8/17/2011	M F U	D A	MLL	8/15/2011	M F U	D A	MLL	8/6/2011	M F U	D A	MLL	8/17/2011	M F U	D A	MLL
2	8/18/2011	M F U	D A	MLL	8/15/2011	M F U	D A	MLL	8/8/2011	M F U	D A	KN	8/16/2011	M F U	D A	DS
3	8/19/2011	M F U	D A	MLL	8/18/2011	M F U	D A	DR	8/17/2011	M F U	D A	MLL	8/18/2011	M F U	D A	MLL
4	8/25/2011	M F U	D A	MLL	8/23/2011	M F U	D A	KN	8/16/2011	M F U	D A	ES	8/22/2011	M F U	D A	DS
5	8/26/2011	M F U	D A MLL 8/29/11	MLL	8/26/2011	M F U	D A	MLL	8/19/2011	M F U	D A	DS	8/24/2011	M F U	D A	AD
6	8/28/2011	M F U	D A	DS	8/28/2011	M F U	D A	DS	8/19/2011	M F U	D A	AD	8/25/2011	M F U	D A	DS
7	8/29/2011	M F U	D A	MLL	9/3/2011	M F U	D A	MLL	9/4/2011	M F U	D A	MLL	8/29/2011	M F U	D A	MLL
8	8/29/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		8/30/2011	M F U	D A	DS
9	9/1/2011	M F U	D A	AD	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	9/2/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 8	Replicate 9	Replicate 10	Replicate 11
Number fully emerged live midges 9	Number fully emerged live midges 6	Number fully emerged live midges 5	Number fully emerged live midges 8
Number dead or partially emerged midges 1	Number dead or partially emerged midges 1	Number dead or partially emerged midges 2	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination 1	Number of live pupae at test termination Ø
Total number alive pupae and midge ~~8~~ 9 MLL 9/17/11	Total number alive pupae and midge ~~5~~ 6 MLL 9/17/11	Total number alive pupae and midge 6	Total number alive pupae and midge ~~7~~ 8 MLL 9/17/11

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 53 Date: 9/06/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9059

Number Daily Renewals: 2

☒ 0624 MLL Renewal time/initials ☒ 1715 AD Renewal time/initials

☐ —— Renewal time/initials ☐ —— Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 024 AD ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1430 AD chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AD
Meter ID	40	6	
1			
2	22.7	4.0	BHV NAV
3	—	—	
4	—	—	
5	—	—	
6	22.9	4.9	
7			
8	—	—	BHV NAV
9			
10	—	—	BHV NAV
11	—	—	
12			

Test Day: Day 54 Date: 9/07/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number):

Number Daily Renewals: 0

☐ —— Renewal time/initials ☐ —— Renewal time/initials

☐ —— Renewal time/initials ☐ —— Renewal time/initials

Food: (Tertrafin 4g/L) TFS# —— ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1516 AB chemistries time/Initial * chems from composite sample

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials AW
Meter ID	40	4	6	
1				
2	—	—	—	Ø
3	—	—	—	Ø
* 4	22.2	7.75	6.8	Ø
5	—	—	—	Ø
6	—	—	—	Ø
7				
8	—	—	—	Ø
9				
10	—	—	—	Ø
11	—	—	—	Ø
12				

	end mL	start mL	mL used	
Rep'd	21.5	18.5	3.0	120
AW	46.5	41.4	5.1	102

S.C. 264.0

NH4: ND 0.01

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 2.5

Concentration: 60%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985

Sample ID: ERM 2.5 Concentration: 60%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/15/2011	M (F) U	D (A)	TB	8/8/2011	(M) F U	D (A)	KN	8/17/2011	(M) F U	D (A)	DS	8/16/2011	(M) F U	(D) A Removed	AMS
2	8/18/2011	(M) F U	D (A)	DR	8/19/2011	(M) F U	(D) A	DS	8/19/2011	(M) F U	D (A)	DS	8/19/2011	M (F) U	D (A)	DS
3	8/19/2011	M (F) U	D (A)	AD	8/22/2011	M (F) U	D (A)	DS	8/19/2011	(M) F U	D (A)	DS	8/21/2011	(M) F U	D (A)	KN
4	8/22/2011	(M) F U	D (A)	DS	8/23/2011	M (F) U	(D) A	KN	8/20/2011	(M) F U	D (A)	MW	8/24/2011	(M) F U	(D) A	MW
5	8/27/2011	M (F) U	D (A)	DS	8/26/2011	(M) F U	D (A)	MW	8/23/2011	(M) F U	D (A)	KN	8/31/2011	(M) F U	D (A)	DS
6	8/27/2011	M (F) U	D (A)	DS	/2011	M F U	D A		8/27/2011	M (F) U	D (A)	DS	/2011	M F U	D A	
7	8/28/2011	M (F) U	D (A)	DS	/2011	M F U	D A		8/29/2011	M (F) U	D (A)	DS	/2011	M F U	D A	
8	/2011	M F U	D A		/2011	M F U	D A		8/28/2011	M (F) U	D (A)	DS	/2011	M F U	D A	
9	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
10	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

Replicate 2	Replicate 3	Replicate 4	Replicate 5
Number fully emerged live midges 7	Number fully emerged live midges 3	Number fully emerged live midges 8	Number fully emerged live midges 3
Number dead or partially emerged midges Ø	Number dead or partially emerged midges 2	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 2
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 7	Total number alive pupae and midge 3	Total number alive pupae and midge 8	Total number alive pupae and midge 3
20 Day Survival Rep 1 - 12 /12	20 Day Survival Rep 7 - 11 /12	20 Day Survival Rep 9 - 12 /12	20 Day Survival Rep 12 - 11 /12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: ALL

Sample ID: ERM 2.5
Concentration: 60%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 60%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials
1	8/11/2011	M (F) U	D (A)	EB	8/10/2011	(M) F U	D (A)	DS	8/5/2011	(M) F U	D (A)	EB	8/18/2011	(M) F U	D (A)	[illegible]
2	8/14/2011	(M) F U	(D) A	KN	8/16/2011	(M) F U	D (A)	DS	8/11/2011	(M) F U	(D) A	EB	8/24/2011	(M) F U	D (A)	KM
3	8/20/2011	M (F) U	D (A)	[illegible]	8/26/2011	M (F) U	D (A)	[illegible]	8/20/2011	M (F) U	D (A)	[illegible]	8/26/2011	(M) F U	D (A)	[illegible]
4	8/24/2011	M (F) U	D (A)	KS	8/29/2011	(M) F U	D (A)	[illegible]	8/26/2011	(M) F U	D (A)	[illegible]	8/27/2011	M (F) U	D (A)	DS
5	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		8/28/2011	(M) F U	D (A)	DS
6	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		8/28/2011	(M) F U	D (A)	DS
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		9/3/2011	M (F) U	D (A)	[illegible]
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

	Replicate 6	Replicate 8	Replicate 10	Replicate 11
Number fully emerged live midges	3	4	3	7
Number dead or partially emerged midges	1	Ø	1	Ø
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	3	4	3	7

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: ~~NA~~ 80% DS 9/13/11

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/11	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/11	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 55	Number Daily Renewals: ~~2~~ 1 9/15/11 MLL
Date: 9/08/2011	~~X~~ DS 6126 renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water: Dechlor (Glec Laboratory Water)	☐ ——— renewal time/Initials ☐ ——— renewal time/Initials
Overlying Water Batch ID (GLC Number): NA	Food: (Tetrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate
✓ 1145 AS chemistries time/Initial	Screens Cleaned: ☐ yes ☐ no ☑ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ ~~10~~ 12 organisms per replicate 9/15/11
Record Meter ID	40	4	6	113	AS 9/19/11 ~~120~~	AS 9/19/11 ~~102~~ 4	8	Int: MLL
1	—	—	—	—	—	—	ND -0.01	—
2	23.0	7.60	4.9	257.8	120	102	—	Ø
3	23.0	7.65	5.7	255.2	—	—	—	Ø
4	—	—	—	—	—	—	—	Ø
5	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	Ø
9	—	—	—	—	—	—	—	Ø
10	—	—	—	—	—	—	—	Ø
11	—	—	—	—	—	—	—	Ø
12	—	—	—	—	—	—	—	Ø

	Alk.	Hard
end mL	25.0	7.4
start mL	19.9	4.4
	5.1	3.0

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*Alkalinity, hardness and ammonia analyzed from a composite sample of all 12 replicates.

Relative % Difference: RPD ≤15%	Ammonia Reporting Limits:	Observation Key:
RPD = $\frac{(s_1 - s_2)}{(s_1 + s_2)/2}$ x 100 =	RL = Reporting Limit (0.10 mg/L).	AV: Animals Visible
	MDL = Minimum Detection Limit (0.04 mg/L) - last updated 11/15/10.	NAV: No Animals Visible
	J = ≥ MDL and < RL.	FOV: Foreign Organism Visible
	U = Below MDL.	

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials
1	8/15/2011	M F U	D A	SAM	8/12/2011	M F U	D A	MLL	8/15/2011	M F U	D A	MLL	8/18/2011	M F U	D A	DR
2	8/15/2011	M F U	D A	SAM	8/13/2011	M F U	D A	DJ	8/15/2011	M F U	D A partially emerged	MLL	8/24/2011	M F U	D A	AO
3	8/19/2011	M F U	D A	DS	8/24/2011	M F U	D A	AO	8/26/2011	M F U	D A	MLL	8/26/2011	M F U	D A	MLL
4	8/22/2011	M F U	D A	DS	8/25/2011	M F U	D A	DS	8/29/2011	M F U	D A	MLL	8/28/2011	M F U	D A	DS
5	/ /2011	M F U	D A		8/26/2011	M F U	D A	MLL	9/4/2011	M F U	D A Par emerg	MLL	8/31/2011	M F U	D A	DS
6	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		9/2/2011	M F U	D A	DS
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 2	Replicate 3	Replicate 4	Replicate 8
Number fully emerged live midges 2	Number fully emerged live midges 5	Number fully emerged live midges ~~4~~ 1 (MLW 9/17/11)	Number fully emerged live midges 5
Number dead or partially emerged midges 2	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 4	Number dead or partially emerged midges 1
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge ~~Ø~~ 2 (MLW 9/17/11)	Total number alive pupae and midge ~~Ø~~ 5 (MLW 9/17/11)	Total number alive pupae and midge ~~Ø~~ 1 (MLW 9/17/11)	Total number alive pupae and midge ~~Ø~~ 5 (MLW 9/17/11)
20 Day Survival Rep 1 - 9 /12	20 Day Survival Rep 5 - 10 /12	20 Day Survival Rep 6 - 12 /12	20 Day Survival Rep 7 - 10 /12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: DS 8/4/11 ER 8985
Sample ID: ERM 2.5 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/9/2011	M F U	D A Red Wings	SAM	8/15/2011	M F U	D A	MLL	8/17/2011	M F U	D A	[illegible]	8/18/2011	M F U	D A	[illegible]
2	8/13/2011	M F U	D A	[illegible]	8/22/2011	M F U	D A	DS	8/18/2011	M F U	D A	[illegible]	8/21/2011	M F U	D A	KN
3	8/15/2011	M F U	D A partially emerged	MLL	8/23/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS	8/25/2011	M F U	D A	[illegible]
4	8/25/2011	M F U	D A	[illegible]	/ /2011	M F U	D A		8/23/2011	M F U	D A	KN	/ /2011	M F U	D A	
5	/ /2011	M F U	D A		/ /2011	M F U	D A		8/28/2011	M F U	D A	DS	/ /2011	M F U	D A	
6	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

	Replicate 9	Replicate 10	Replicate 11	Replicate 12
Number fully emerged live midges	3	Ø	5	2
Number dead or partially emerged midges	1	3	Ø	1
Number of live pupae at test termination	Ø [illegible] 9/17/11	Ø	Ø [illegible] 9/17/11	Ø [illegible] 9/17/11
Total number alive pupae and midge	~~Ø~~ 3	Ø	~~Ø~~ 5	~~Ø~~ 2

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): ~~9049~~ 59 MW 9/7/11

Number Daily Renewals: 2

☒ 605 MW Renewal time/initials ☐ — Renewal time/initials

☒ 1743 EB Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 071 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 516 MW chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials KB
Meter ID	40	6	
1	—	—	NAV
2	—	—	|
3	—	—	|
4	—	—	|
5			
6	—	—	NAV
7			
8	—	—	NAV
9			
10	23.0	5.7	BHV NAV
11	23.0	5.2	|
12			

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): ~~9049~~ 59 MW 9/7/11

Number Daily Renewals: 1

☒ 609 MW Renewal time/initials ☐ — Renewal

☐ — Renewal time/initials ☐ — Renewal

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ ~~no~~ ☐ n/a

☒ 516 MW chemistries time/Initial

stale down NH4: ND - 2.04

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials MW
Meter ID	40	6	
1	22.8	4.7	Ø
2	22.7	4.5	Ø
3	—	—	Ø
4	—	—	Ø
5			
6	—	—	Ø
7			
8	—	—	Ø
9			
10	—	—	Ø
11	—	—	Ø
12			

#4 pH	#113 SC
7.59	266.0
7.62	265.9

AS

	end mL	start mL	vol used	
Hard	28.8	25.7	3.1	124
Alk.	18.7	13.7	5.0	100

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 100%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials
1	8/9/2011	M F (U)	(D) A incomplete	TB	8/13/2011	(M) F U	D (A)	KN	8/11/2011	(M) F U	(D) A	KN	8/17/2011	(M) F U	D (A)	MW
2	8/15/2011	M (F) U	D (A)	MLL	8/19/2011	(M) F U	D (A)	MW	8/15/2011	M F (U)	(D) A	TB	8/17/2011	(M) F U	D (A)	CB
3	8/21/2011	M (F) U	D (A)	KN	8/25/2011	M (F) U	(D) A	DS	8/26/2011	M F U	D (A)	MW	8/20/2011	M F (U)	(D) A	TB
4	8/22/2011	M (F) U	D (A)	DS	8/25/2011	M (F) U	(D) A	DS	8/31/2011	(M) F U	(D) A	MW	8/21/2011	(M) F U	D (A)	KN
5	8/22/2011	M (F) U	D (A)	DS	8/26/2011	(M) F U	(D) A	MW	/ /2011	M F U	D A		8/22/2011	(M) F U	D (A)	DS
6	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		8/22/2011	(M) F U	D (A)	DS
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		8/25/2011	M (F) U	D (A)	DS
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 1	Replicate 2	Replicate 3	Replicate 4
Number fully emerged live midges 4	Number fully emerged live midges 2	Number fully emerged live midges 1	Number fully emerged live midges 6
Number dead or partially emerged midges 1	Number dead or partially emerged midges 3	Number dead or partially emerged midges 3	Number dead or partially emerged midges 1
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 4	Total number alive pupae and midge 2	Total number alive pupae and midge 1	Total number alive pupae and midge 6
20 Day Survival Rep 5 - 8 /12	20 Day Survival Rep 7 - 5 /12	20 Day Survival Rep 9 - ___ /12 4+1 pupae/12	20 Day Survival Rep 12 - 6 /12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 2.5
Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8985
Sample ID: ERM 2.5 Concentration: 100%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials
1	8/10/2011	M F U	D A	SAM	8/12/2011	M F U	D A MOSTLY EMERGED	KN	8/11/2011	M F U	D A	CB	8/18/2011	M F U	D A	MLL
2	8/12/2011	M F U	D A Dried up/ INCOMPLETE	KN	8/15/2011	M F U	D A	MLL	8/15/2011	M F U	D A	MLL	8/24/2011	M F U	D A	AB
3	8/20/2011	M F U	D A	MLL	8/19/2011	M F U	D A	AD	8/20/2011	M F U	D A	MLL	8/24/2011	M F U	D A	AB
4	8/29/2011	M F U	D A	MLL	8/25/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS	8/24/2011	M F U	D A partially emerged	AB
5	/2011	M F U	D A		/2011	M F U	D A		8/20/2011	M F U	D A	MLL	8/25/2011	M F U	D A	DS
6	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
7	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
8	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
9	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
10	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

	Replicate 6	Replicate 8	Replicate 10	Replicate 11
Number fully emerged live midges	1	2	4	1
Number dead or partially emerged midges	3	2	1	4
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	1	2	4	1

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 53 Date: 9/06/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9059

Number Daily Renewals: ☒ 1 9/6/11 MLL

☒ 0630 MLL Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☑ n/a

☒ 1200 MLL chemistries time/Initial Lifedawn

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials MLL
Meter ID	40	6	
1			
2	—	—	Ø
3	—	—	Ø
4	—	—	Ø
5	—	—	Ø
6			
7			
8	—	—	Ø
9			
10	—	—	Ø
11	23.0	4.0	Ø
12	23.1	2.6	Ø

pH #113
4 SC

ALK = 102
HARD = 120
PH = 7.86

NH4: 0.16

SC #113 #4 pH
260.4 | 7.55
258.2 | 7.41

Test Day: Day 54 Date: 9/07/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number):

Number Daily Renewals:

☐ Renewal time/initials ☐ Renewal time/initials

☐ Renewal time/initials ☐ Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials_____
Meter ID				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

MLL 9/15/11

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 3.5
Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987
Sample ID: ERM 3.5 Concentration: 10%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/9/2011	M F U	D A	AD	08/03/2011	M F U	D A	~~DS~~ AD	08/03/2011	M F U	D A	AD	8/4/2011	M F U	D A	SAM
2	8/11/2011	M F U	D A	CB	08/03/2011	M F U	D A	~~DS~~ AD	8/6/2011	M F U	D A	nw	8/6/2011	M F U	D A	DS
3	8/11/2011	M F U	D A	MLL	8/4/11 AD 08/03/2011	M F U	D A	~~DS~~ AD	8/7/2011	M F U	D A	CB	8/10/2011	M F U	D A	DS
4	8/13/2011	M F U	D A	DS	8/9/2011	M F U	D A	AD	8/8/2011	M F U	D A	MLL	8/12/2011	M F U	D A	nw
5	8/13/2011	M F U	D A	DS	8/18/2011	M F U	D A	nw	8/9/2011	8/9/11 AD M F U	D A	AD	8/16/2011	M F U	D A	DS
6	8/15/2011	M F U	D A	TB	8/19/2011	M F U	D A	DS	8/11/2011	M F U	D A	CB	8/16/2011	M F U	D A	DS
7	8/18/2011	M F U	D A	nw	8/23/2011	M F U	D A	KN	8/12/2011	M F U	D A	TB	8/19/2011	M F U	D A	DS
8	8/19/2011	M F U	D A	DS	8/25/2011	M F U	D A	nw	8/18/2011	M F U	D A	nw	8/20/2011	M F U	D A	nw
9	8/20/2011	M F U	D A	nw	8/26/2011	M F U	D A	nw	8/19/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN
10	8/21/2011	M F U	D A	KN	9/2/2011	M F U	D A	DS	/2011	M F U	D A		8/21/2011	M F U	D A	KN
11	~~8/23~~/2011	M F U	D A KN 8/23/11	~~KN~~	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	~~8/23~~/2011	M F U	D A KN 8/23/11	~~KN~~	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

	Replicate 2	Replicate 3	Replicate 4	Replicate 5
Number fully emerged live midges	10	10	9	9
Number dead or partially emerged midges	Ø	Ø	Ø	1
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	10	10	9	9
20 Day Survival Rep	1 - /12 7+1 pupae/12	6 - /12 7+2 pupae/12	7 - 12/12	9 - /12 11+1 pupae/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 3.5
Concentration: 10%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987
Sample ID: ERM 3.5 Concentration: 10%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	08/03/2011	M F U	D A	AD/KN	8/4/2011	M F U	D A	SAM	8/5/2011	M F U	D A	DR	8/5/2011	M F U	D A	DR
2	8/7/2011	M F U	D A	MW	8/7/2011	M F U	D A	MW	8/8/2011	M F U	D A	KN	8/5/2011	M F U	D A	DR
3	8/7/2011	M F U	D A	CB	8/9/2011	M F U	D A	SAM	8/10/2011	M F U	D A	DS	8/11/2011	M F U	D A	CB
4	8/9/2011	M F U	D A	AD	8/11/2011	M F U	D A	CB	8/11/2011	M F U	D A	CB	8/11/2011	M F U	D A	CB
5	8/9/2011	M F U	D A	AD	8/14/2011	M F U	D A	MLL	8/12/2011	M F U	D A	TB	8/14/2011	M F U	D A	MLL
6	8/12/2011	M F U	D A	MW	8/16/2011	M F U	D A	AD	8/14/2011	M F U	D A	KN	8/20/2011	M F U	D A	MW
7	8/12/2011	M F U	D A INCOMPLETE	KN	8/22/2011	M F U	D A	DS	8/17/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN
8	8/14/2011	M F U	D A	MLL	8/26/2011	M F U	D A	MW	8/18/2011	M F U	D A	DR	8/22/2011	M F U	D A	DS
9	8/15/2011	M F U	D A	MLL	8/26/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW	8/24/2011	M F U	D A	MW
10	8/20/2011	M F U	D A	TB	/ /2011	M F U	D A		/ /2011	M F U	D A		8/31/2011	M F U	D A	MW
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

	Replicate 8	Replicate 10	Replicate 11	Replicate 12
Number fully emerged live midges	8	9	8	10
Number dead or partially emerged midges	2	Ø	1	Ø
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	8	9	8	10

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 60 Date: 9/13/2011

Overlying Water: Emory River Water Nur 9/13/11

Overlying Water Batch ID (GLC Number): ~~9049~~ 9063

Number Daily Renewals: 2

☒ DS 6:52 Renewal time/initials ☐ ——— Renewal time/initials

☒ 1700 TB Renewal time/initials ☐ ——— Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 074 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1530 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AS
Meter ID	41	6	
1			
2	—	—	NAV
3	23.2	3.9	BHV
4			
5			
6	—	—	NAV
7			
8	23.1	4.4	NAV
9	—	—	
10	—	—	
11	—	—	BHV
12	—	—	

Test Day: Day 61 Date: 9/14/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049

Number Daily Renewals: 0

☐ ——— Renewal time/initials ☐ ——— Renewal time/initials

☐ ——— Renewal time/initials ☐ ——— Renewal time/initials

Food: (Tertrafin 4g/L) TFS# ——— ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☑ n/a

☒ 0630 Nur chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Observations Initials Nur
Meter ID	40	4	6	
1				
2	—	—	—	Ø
3	—	—	—	Ø
4				
5				
6	—	—	—	Ø
7				
8	—	—	—	Ø
9	—	—	—	Ø
10	—	46 Nur 9/14/11	—	Ø
11	23.2	7.69	3.0	Ø
12	23.2	7.66	2.8	Ø

NH4: 0.10

	end mL	start mL	mL used	
Hard	18.7	15.6	3.1	124
Alk	46.5 4.1 AS 9/14/11	41.1	5.4	108
Duplicate				
Hard	22.0	18.7	3.3	132
Alk				

SC
2627
2689

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: 3.5 ERM
Concentration: 20%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987
Sample ID: ERM 3.5 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials
1	8/8/2011	M F U	D A	MLL	08/03/2011	M F U	D A	DR/AD	08/03/2011	M F U	D A	DR/AD	08/03/2011	M F U	D A	DR/AD
2	8/11/2011	M F U	D A	NW	8/8/2011	M F U	D A	MLL	8/6/2011	M F U	D A	NW	8/7/2011	M F U	D A	MLL
3	8/12/2011	M F U	D A	NW	8/9/2011	M F U	D A	TB	8/8/2011	M F U	D A	DS	8/8/2011	M F U	D A	MLL
4	8/15/2011	M F U	D A	MLL	8/13/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS	8/8/2011	M F U	D A	MLL
5	8/19/2011	M F U	D A	DS	8/18/2011	M F U	D A	NW	8/15/2011	M F U	D A partially emerged	MLL	8/15/2011	M F U	D A	MLL
6	8/19/2011	M F U	D A	DS	8/25/2011	M F U	D A	NW	8/17/2011	M F U	D A	DS	8/15/2011	M F U	D A	TB
7	8/21/2011	M F U	D A	KN	8/27/2011	M F U	D A	DS	8/18/2011	M F U	D A	NW	8/21/2011	M F U	D A partially emerged	KN
8	8/23/2011	M F U	D A	KN	8/29/2011	M F U	D A	NW	8/18/2011	M F U	D A	DR	8/21/2011	M F U	D A	KN
9	8/23/2011	M F U	D A	KN	9/4/2011	M F U	D A	NW	8/19/2011	M F U	D A	DS	8/25/2011	M F U	D A	DS
10	8/26/2011	M F U	D A	NW	9/10/2011	M F U	D A	AD	9/6/2011	M F U	D A	MLL	/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 2	Replicate 3	Replicate 6	Replicate 8
Number fully emerged live midges 9	Number fully emerged live midges 7	Number fully emerged live midges 8	Number fully emerged live midges 7
Number dead or partially emerged midges 1	Number dead or partially emerged midges 3	Number dead or partially emerged midges 2	Number dead or partially emerged midges 2
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 9	Total number alive pupae and midge 7	Total number alive pupae and midge 8	Total number alive pupae and midge 7
20 Day Survival Rep 1 - 12 /12	20 Day Survival Rep 4 - ___ /12 11+1 midge/12	20 Day Survival Rep 5 - 11 /12	20 Day Survival Rep 7 - ___ /12 11+1 midge/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 3.5
Concentration: 20%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987
Sample ID: ERM 3.5 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F U	D A	KN	8/8/2011	M F U	D A	KN	8/16/2011	M F U	D A	MLL	8/11/2011	M F U	D A	MLL
2	8/7/2011	M F U	D A	CB	8/10/2011	M F U	D A	DS	8/17/2011	M F U	D A	MLL	8/18/2011	M F U	D A	MLL
3	8/8/2011	M F U	D A	KN	8/16/2011	M F U	D A	DS	8/14/2011	M F U	D A	KN	8/18/2011	M F U	D A	MLL
4	8/14/2011	M F U	D A	MLL	8/16/2011	M F U	D A	DS	8/19/2011	M F U	D A	MLL	8/19/2011	M F U	D A	AD
5	8/14/2011	M F U	D A	MLL	8/16/2011	M F U	D A	DS	8/20/2011	M F U	D A	MLL	8/20/2011	M F U	D A	MLL
6	8/15/2011	M F U	D A	MLL	8/19/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS	8/28/2011	M F U	D A	AD
7	8/17/2011	M F U	D A	DS	8/29/2011	M F U	D A	MLL	8/26/2011	M F U	D A	MLL	8/29/2011	M F U	D A	MLL
8	8/21/2011	M F U	D A	KN	8/29/2011	M F U	D A	MLL	8/30/2011	M F U	D A	DS	8/29/2011	M F U	D A	MLL
9	8/22/2011	M F U	D A	DS	/2011	M F U	D A		9/1/2011	M F U	D A	AD	/2011	M F U	D A	
10	8/25/2011	M F U	D A	DS	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

	Replicate 9	Replicate 10	Replicate 11	Replicate 12
Number fully emerged live midges	10	8	9	8
Number dead or partially emerged midges	Ø	Ø	Ø	Ø
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	10	8	9	8

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 60 Date: 9/13/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals: Ø

□ — Renewal time/initials □ — Renewal time/initials

□ — Renewal time/initials □ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — □ Feed 1.5 ml/replicate

Screens Cleaned: □ yes ☑ no □ n/a

☒ 900 hrs chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials NW		
Meter ID	40	6			SC*113
1	—	—	pH*4	Ø	
2	—	—	—	Ø	
3	2 NW 9/13/11				
4	22.3	4.4	7.12	Ø	264.1
5					
6	23.2	4.7	7.25	Ø	261.3
7					
8					NH4: ND -0.02
9	—	—	—	Ø	
10	—	—	—	Ø	
11	—	—	—	Ø	
12	—	—	—	Ø	

Test Day: Day Date:

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9062

Number Daily Renewals:

□ Renewal time/initials □ Renewal

□ Renewal time/initials □ Renewal

Food: (Tertrafin 4g/L) TFS# □ Feed 1.5 ml/replicate

Screens Cleaned: □ yes □ no □ n/a

□ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials
Meter ID			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 3.5
Concentration: 40%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987
Sample ID: ERM 3.5 Concentration: 40%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	DP	8/9/2011	M F U	D A	AD	8/11/2011	M F U	D A	MW	8/8/2011	M F U	D A	MLL
2	8/12/2011	M F U	D A	MW	8/9/2011	M F U	D A	AD	8/12/2011	M F U	D A	MW	8/9/2011	M F U	D A	TB
3	8/15/2011	M F U	D A partially emerged	MLL	8/11/2011	M F U	D A	MLL	8/14/2011	M F U	D A	KN	8/11/2011	M F U	D A	CB
4	8/20/2011	M F U	D A	MW	8/12/2011	M F U	D A	MW	8/15/2011	M F U	D A	TB	8/19/2011	M F U	D A	MW
5	8/21/2011	M F U	D A	KN	8/17/2011	M F U	D A	MW	8/21/2011	M F U	D A	KN	8/19/2011	M F U	D A	DS
6	8/26/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW	8/26/2011	M F U	D A	MW	8/20/2011	M F U	D A	MW
7	9/2/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN	8/30/2011	M F U	D A	MLL	8/29/2011	M F U	D A	MW
8	/2011	M F U	D A		8/27/2011	M F U	D A	DS	8/31/2011	M F U	D A	DS	8/30/2011	M F U	D A	DS
9	/2011	M F U	D A		8/27/2011	M F U	D A	DS	9/3/2011	M F U	D A	MW	/2011	M F U	D A	
10	/2011	M F U	D A		9/2/2011	M F U	D A	DS	9/3/2011	M F U	D A	KB	/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		9/7/2011	M F U	D A	DS	/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		9/9/2011	M F U	D A	KS	/2011	M F U	D A	

Replicate 1	Replicate 2	Replicate 4	Replicate 6
Number fully emerged live midges 6	Number fully emerged live midges 10	Number fully emerged live midges 10	Number fully emerged live midges 8
Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 2	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 6	Total number alive pupae and midge 10	Total number alive pupae and midge 10	Total number alive pupae and midge 8
20 Day Survival Rep 3 - 12/12	20 Day Survival Rep 5 - 12/12	20 Day Survival Rep 7 - ___/12 11+1 midge/12	20 Day Survival Rep 8 - 12/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: 3.5 ERM

Concentration: 40%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987

Sample ID: ERM 3.5 Concentration: 40%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/5/2011	M F U	D A	mw	8/4/2011	M F U	D A	KN	8/11/2011	M F U	D A	mw	8/12/2011	M F U	D A	mw
2	8/7/2011	M F U	D A	mw	8/13/2011	M F U	D A	mw	8/15/2011	M F U	D A	MLL	8/12/2011	M F U	D A	TB
3	8/9/2011	M F U	D A	AD	8/18/2011	M F U	D A	mw	8/20/2011	M F U	D A	mw	8/15/2011	M F U	D A	MLL
4	8/16/2011	M F U	D A	TB	8/19/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN	8/15/2011	M F U	D A	SAM
5	8/21/2011	M F U	D A	KN	8/20/2011	M F U	D A	mw	8/23/2011	M F U	D A	KN	8/20/2011	M F U	D A	mw
6	8/23/2011	M F U	D A	KN	8/21/2011	M F U	D A	KN	8/29/2011	M F U	D A	mw	8/21/2011	M F U	D A	KN
7	8/29/2011	M F U	D A	mw	8/25/2011	M F U	D A	AS	/2011	M F U	D A		8/21/2011	M F U	D A	KN
8	/2011	M F U	D A		8/31/2011	M F U	D A	DS	/2011	M F U	D A		8/22/2011	M F U	D A	DS
9	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
10	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

	Replicate 9	Replicate 10	Replicate 11	Replicate 12
Number fully emerged live midges	7	7	6	7
Number dead or partially emerged midges	Ø	1	Ø	1
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	7	7	6	7

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049 59 mw 9/1/11

Number Daily Renewals: 1

☒ 610 mw Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 527 mw chemistries time/Initial Yeledon

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials MW
Meter ID	40	6	
1	—	—	Ø
2	—	—	1 pupae
3	—	—	Ø
4			
5	—	—	Ø
6	—	—	Ø
7			
8	—	—	Ø
9	22.6	5.5	2 pupae
10			
11			
12	22.6	5.1	Ø

NH4: ND 0.03

NH4 dup: ND 0.03

pH SL

7.70 265.1

7.56 263.1

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9049

Number Daily Renewals:

☐ Renewal time/initials ☐ Renewal

☐ Renewal time/initials ☐ Renewal

Food: (Tertrafin 4g/L) TFS# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials_____
Meter ID			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

mw 8/3/11

AS

	mL end	stock mL	mL used	
Hard	29.0	25.7	3.3	132
Alk	17.8	12.7	5.1	102

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 3.5
Concentration: 60%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987
Sample ID: ERM 3.5 Concentration: 60%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials
1	8/9/2011	M F U	D A	AD	8/11/2011 (11 mwr 7/22/11)	M F U	D A	mwr	8/9/2011	M F U	D A	TB	8/15/2011	M F U	D A	MLL
2	8/12/2011	M F U	D A	KN	8/13/2011	M F U	D A	DS	8/11/2011	M F U	D A	eB	8/15/2011	M F U	D A	MLL
3	8/12/2011	M F U	D A	TB	8/18/2011	M F U	D A	mwr	8/17/2011	M F U	D A	KN	8/20/2011	M F U	D A	mwr
4	8/14/2011	M F U	D A	KN	8/20/2011	M F U	D A	mwr	8/20/2011	M F U	D A	mwr	8/26/2011	M F U	D A	mwr
5	8/15/2011	M F U	D A	eB	8/20/2011	M F U	D A	mwr	8/26/2011	M F U	D A	mwr	8/28/2011	M F U	D A	DS
6	8/20/2011	M F U	D A	TB	8/20/2011	M F U	D A	TB	8/27/2011	M F U	D A	DS	/ /2011	M F U	D A	
7	8/21/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A	
8	8/22/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	8/22/2011	M F U	D A	KN	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	8/30/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 1	Replicate 2	Replicate 3	Replicate 5
Number fully emerged live midges 10	Number fully emerged live midges 7	Number fully emerged live midges 5	Number fully emerged live midges 5
Number dead or partially emerged midges Ø	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination 1	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 10	Total number alive pupae and midge 8	Total number alive pupae and midge 5	Total number alive pupae and midge 5
20 Day Survival Rep 4 - 12/12	20 Day Survival Rep 7 - 11/12	20 Day Survival Rep 10 - 10/12	20 Day Survival Rep 11 - 10/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 3.5

Concentration: 60%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987

Sample ID: ERM 3.5 Concentration: 60%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 8 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/11/2011	M F U	D A	EB	8/11/2011	M F U	D A	nw	8/16/2011	M F U	D A	DS	8/11/2011	M F U	D A	EB
2	8/14/2011	M F U	D A	MLL	8/17/2011	M F U	D A	DS	8/17/2011	M F U	D A	DS	8/12/2011	M F U	D A	TB
3	8/15/2011	M F U	D A	MLL	8/22/2011	M F U	D A	DS	8/23/2011	M F U	D A	KN	8/18/2011	M F U	D A	nw
4	8/20/2011	M F U	D A	nw	8/24/2011	M F U	D A	AD	8/23/2011	M F U	D A	KN	8/23/2011	M F U	D A	KN
5	8/22/2011	M F U	D A 8/22/11	DS	8/29/2011	M F U	D A 8/29/11	nw	8/29/2011	M F U	D A	nw	8/23/2011	M F U	D A	KN
6	8/23/2011	M F U	D A	KN	8/30/2011	M F U	D A	DS	/ /2011	M F U	D A		8/26/2011	M F U	D A	nw
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		8/26/2011	M F U	D A	nw
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 6	Replicate 8	Replicate 9	Replicate 12
Number fully emerged live midges 3	Number fully emerged live midges 6	Number fully emerged live midges 4	Number fully emerged live midges 5
Number dead or partially emerged midges 3	Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1	Number dead or partially emerged midges 2
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination 2	Number of live pupae at test termination Ø
Total number alive pupae and midge 3	Total number alive pupae and midge 6	Total number alive pupae and midge 6	Total number alive pupae and midge 5

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): ~~9049~~ 59 mw 9/7/11

Number Daily Renewals: 2

☒ 610 mw Renewal time/initials — Renewal time/initials

☒ 1743 EB Renewal time/initials — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 071 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 537 mw chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AB
Meter ID	40	6	
1	—	—	NAV
2	—	—	|
3	—	—	|
4	—	—	|
5			
6	—	—	NAV
7	—	—	|
8			
9	22.6	4.7	NAV
10			
11			
12	22.7	4.9	NAV

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): ~~9049~~ 59 mw 9/7/11

Number Daily Renewals: 1

☒ 605 Renewal time/initials ☐ — Renewal

☐ — Renewal time/initials ☐ — Renewal

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 520 mw chemistries time/Initial

take down NH4: ND -1.66

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials mw
Meter ID	40	6	
1	22.9	4.4	Ø pupa
2	22.8	4.3	Ø
3	—	—	Ø
4	—	—	1 pupa
5			
6	—	—	1 pupa
7	—	—	Ø
8			
9	—	—	Ø
10			
11			
12	—	—	Ø

	#4 pH	#113 SC
	7.74	273.4
	7.70	274.0

AS

	End mL	Start mL	mL used	
Hard	22.5	19.3	3.2	128
AM	8.7	3.5	5.2	104

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 3.5
Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987
Sample ID: ERM 3.5 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 1 Hatch Date	Sex	Observations	Initials	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 4 Hatch Date	Sex	Observations	Initials
1	8/4/2011	M F (U)	(D) A Larva	SAM	8/18/2011	(M) F U	D (A)	MW	8/5/2011	(M) F U	D (A)	DR	8/8/2011	(M) F U	D (A)	KN
2	8/9/2011	(M) F U	D (A)	SAM	8/20/2011	M (F) U	D (A)	MW	8/8/2011	(M) F U	(D) A	KN	8/20/2011	(M) F U	D (A)	MW
3	8/25/2011	(M) F U	D (A)	MW	8/26/2011	(M) F U	D (A)	MW	8/10/2011	(M) F U	D (A)	MLL	8/21/2011	M (F) U	D (A)	KN
4	8/29/2011	M (F) U	D (A)	MW	8/29/2011	(M) F U	(D) A	MW	8/18/2011	(M) F U	D (A)	MW	8/23/2011	M (F) U	D (A)	KN
5	/ /2011	M F U	D A		/ /2011	M F U	D A		8/20/2011	M (F) U	D (A)	MW	8/26/2011	(M) F U	D (A)	MW
6	/ /2011	M F U	D A		/ /2011	M F U	D A		8/26/2011	M (F) U	(D) A	MW	8/27/2011	M F (U)	D (A)	AD
7	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 1	Replicate 2	Replicate 3	Replicate 4
Number fully emerged live midges 3	Number fully emerged live midges 3	Number fully emerged live midges 4	Number fully emerged live midges 6
Number dead or partially emerged midges 1	Number dead or partially emerged midges 1	Number dead or partially emerged midges 2	Number dead or partially emerged midges Ø
Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination 1
Total number alive pupae and midge 3	Total number alive pupae and midge 3	Total number alive pupae and midge 4	Total number alive pupae and midge 7
20 Day Survival Rep 5 - 10/12	20 Day Survival Rep 8 - 10/12	20 Day Survival Rep 10 - 10/12	20 Day Survival Rep 11 - 10/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 3.5
Concentration: 80%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: DSS/MI 8987
Sample ID: ~~898.~~ ERM 3.5 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: 07/14/2011
Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: ABS < 24 hours
Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 6 Hatch Date	Sex	Observations	Initials	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 9 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/12/2011	M F U	D A	new	8/18/2011	M F U	D A	new	8/5/2011	M F U	D A	new	8/10/2011	M F U	D A	DS
2	8/12/2011	M F U	D A	new	8/20/2011	M F U	D A	new	8/8/2011	M F U	D A	KN	8/18/2011	M F U	D A	new
3	8/15/2011	M F U	D A	MLL	8/25/2011	M F U	D A	new	8/15/2011	M F U	D A partially emerged	MLL	8/21/2011	M F U	D A	KN
4	8/21/2011	M F U	D A	KN	8/29/2011	M F U	D A	new	8/17/2011	M F U	D A	DS	8/27/2011	M F U	D A	DS
5	8/24/2011	M F U	D A	AO	/ /2011	M F U	D A		8/19/2011	M F U	D A	DS	8/29/2011	M F U	D A	new
6	8/25/2011	M F U	D A	DS	/ /2011	M F U	D A		8/21/2011	M F U	D A	KN	8/29/2011	M F U	D A	new
7	8/31/2011	M F U	D A	DS	/ /2011	M F U	D A		8/21/2011	M F U	D A	KN	/ /2011	M F U	D A	
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

Replicate 6	Replicate 7	Replicate 9	Replicate 12
Number fully emerged live midges 7	Number fully emerged live midges 3	Number fully emerged live midges 6	Number fully emerged live midges 6
Number dead or partially emerged midges Ø	Number dead or partially emerged midges 1	Number dead or partially emerged midges 1	Number dead or partially emerged midges Ø
Number of live pupae at test termination 1	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø	Number of live pupae at test termination Ø
Total number alive pupae and midge 8	Total number alive pupae and midge 3	Total number alive pupae and midge 6	Total number alive pupae and midge 6

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

QC'd by: MLL

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: 07/14/2011	Test Organism Source/Age: ABS <24 hours
Test Initiation Date: 07/15/2011	Test Termination Date: 08/04/11 and Emergence TBD

Test Day: Day 50 Date: 9/03/2011

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 90~~49~~59 MLW 9/7/11

Number Daily Renewals: 2

☒ 610 MLW Renewal time/initials ☐ — Renewal time/initials

☒ 1743 EB Renewal time/initials ☐ — Renewal time/initials

Food: (Tertrafin 4g/L) TFS# 071 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 527 MLW chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials AS 9/3/11 NA AS
Meter ID	40	10	
1			
2	—	—	NAV
3	—	—	|
4			
5	—	—	NAV
6	—	—	|
7	—	—	|
8			
9			
10	—	—	NAV
11	22.7	5.4	|
12	22.7	5.2	|

Test Day: Day 51 Date: 9/04/201

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 90~~49~~59 MLW 9/7/11

Number Daily Renewals: 1

☒ 605 MLW Renewal time/initials ☐ — Renewal

☐ — Renewal time/initials ☐ — Renewal

Food: (Tertrafin 4g/L) TFS# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 520 MLW chemistries time/Initial take down

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations Initials MLW
Meter ID	40	6	
1			
2	22.9	4.4	Ø
3	22.9	4.4	Ø
4			
5	—	—	Ø
6	—	—	Ø
7	—	—	Ø
8			
9			
10	—	—	Ø
11	—	—	Ø
12	—	—	Ø

NH4: ND -2.06

#4 pH	#113 SC
7.60	267.0
7.56	264.3

AS

	end mL	start mL	mL used	
Hard	25.7	22.5	3.2	128
Alk.	13.7	8.7	5.0	100

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible
BHV: Burrow Holes Visible

QC'd by: MLL

Sample ID: ERM 3.5

Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987

Sample ID: ERM 3.5 Concentration: 100%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 2 Hatch Date	Sex	Observations	Initials	Replicate 3 Hatch Date	Sex	Observations	Initials	Replicate 5 Hatch Date	Sex	Observations	Initials	Replicate 6 Hatch Date	Sex	Observations	Initials
1	8/6/2011	M F U	D A	DS	8/17/2011	M F U	D A	DS	8/9/2011	M F U	D A	SAM	8/9/2011	M F U	D A partial	TB
2	8/11/2011	M F U	D A	eb	8/19/2011	M F U	D A	DS	8/10/2011	M F U	D A	DS	8/15/2011	M F U	D A	MLL
3	8/14/2011	M F U	D A	KN	8/22/2011	M F U	D A	DS	8/15/2011	M F U	D A	TB	8/20/2011	M F U	D A	TB
4	8/22/2011	M F U	D A	DS	8/22/2011	M F U	D A	DS	8/20/2011	M F U	D A	TB	8/20/2011	M F U	D A	TB
5	8/25/2011	M F U	D A	DS	8/28/2011	M F U	D A	DS	8/27/2011	M F U	D A	DS	8/21/2011	M F U	D A	KN
6	8/26/2011	M F U	D A	nur	8/28/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A	
7	/ /2011	M F U	D A		8/31/2011	M F U	D A	DS	/ /2011	M F U	D A		/ /2011	M F U	D A	
8	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
9	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
10	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
11	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	
12	/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A		/ /2011	M F U	D A	

	Rep 2	Rep 3	Rep 5	Rep 6
Number fully emerged live midges	5	7	5	3
Number dead or partially emerged midges	1	Ø	Ø	2
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	5	7	5	3
20 Day Survival Rep	1 - 10/12	4 - 11/12	8 - 11/12	9 - 12/12

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

QC'd by: MLL

Sample ID: ERM 3.5

Concentration: 100%

TVA: 5069-03

Emory River

Emergence Datasheet *Chironomus dilutus* Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8987

Sample ID: ERM 3.5 Concentration: 100%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: 07/14/2011

Test Initiation Date: 07/15/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 08/04/11 and Emergence TBD

Hatched Individual	Replicate 7 Hatch Date	Sex	Observations	Initials	Replicate 10 Hatch Date	Sex	Observations	Initials	Replicate 11 Hatch Date	Sex	Observations	Initials	Replicate 12 Hatch Date	Sex	Observations	Initials
1	8/18/2011	M F U	D A	MW	8/15/2011	M F U	D A partially emerged	MLL	8/18/2011	M F U	D A	MW	8/11/2011	M F U	D A	CB
2	8/21/2011	M F U	D A	KN	8/17/2011	M F U	D A mostly emerged	KN	8/21/2011	M F U	D A	TB	8/11/2011	M F U	D A	CB
3	8/29/2011	M F U	D A	MW	8/26/2011	M F U	D A	MW	8/23/2011	M F U	D A	KN	8/13/2011	M F U	D A - removed dead larvae	MLL
4	/2011	M F U	D A		/2011	M F U	D A		8/25/2011	M F U	D A	DS	8/25/2011	M F U	D A	MW
5	/2011	M F U	D A		/2011	M F U	D A		8/30/2011	M F U	D A	MLL	8/28/2011	M F U	D A	DS
6	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
7	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
8	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
9	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
10	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
11	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	
12	/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A		/2011	M F U	D A	

	Replicate 7	Replicate 10	Replicate 11	Replicate 12
Number fully emerged live midges	1	1	2	1
Number dead or partially emerged midges	2	2	3	4
Number of live pupae at test termination	Ø	Ø	Ø	Ø
Total number alive pupae and midge	1	1	2	1

Sex Key
M = Male
F = Female
U= Unknown Sex

Observation Key
D = Dead midge or partially emerged dead midge
A = Alive and fully emerged midge

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Surv

Start Date:	7/15/2011	Test ID:	ermcon	Sample ID:	-LCS
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	6/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4	5	6	7	8
GLW	0.8333	0.7500	0.7500	1.0000	0.8333	0.9167	0.9167	0.9167
LCS + GLW	1.0000	1.0000	0.7500	1.0000	0.7500	0.9167	0.6667	0.8333
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.8333	1.0000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.8646	1.0000	1.2068	1.0472	1.4260	10.874	8			
LCS + GLW	0.8646	1.0000	1.2195	0.9553	1.4260	15.963	8	*		
LCS + ERW	0.8750	1.0120	1.2293	0.9553	1.4260	14.292	8	-0.106	1.761	0.1633

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.85291	0.887	-0.0278	-1.5416
F-Test indicates equal variances (p = 0.79)	1.22759	4.99491		
The control means are not significantly different (p = 0.88)	0.15218	2.14479		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.12383	0.14046	0.00038	0.03438	0.91728	1, 14

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	7/15/2011	Test ID:	ermcon	Sample ID:	-LCS
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	6/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4	5	6	7	8
GLW	0.8333	0.7500	0.7500	1.0000	0.8333	0.9167	0.9167	0.9167
LCS + GLW	1.0000	1.0000	0.7500	1.0000	0.7500	0.9167	0.6667	0.8333
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.7500	1.0000

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.8646	1.0000	1.2068	1.0472	1.4260	10.874	8			
LCS + GLW	0.8646	1.0000	1.2195	0.9553	1.4260	15.963	8	*		
LCS + ERW	0.8646	1.0000	1.2164	0.9553	1.4260	15.275	8	0.032	1.761	0.1676

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.84251	0.887	0.0211	-1.6649
F-Test indicates equal variances (p = 0.91)	1.09764	4.99491		
The control means are not significantly different (p = 0.88)	0.15218	2.14479		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.12751	0.14464	3.8E-05	0.03621	0.97464	1, 14

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Surv

Start Date:	7/15/2011	Test ID:	erm0.5em	Sample ID:	ERM 0.5
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water; ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.8333	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	1.0000	0.7500	0.9167	0.7500	0.9167	0.7500	1.0000	0.9167
20	0.6667	0.8333	0.6667	0.9167	0.9167	0.8333	0.8333	0.8333
40	1.0000	0.5000	0.5000	0.8333	1.0000	0.6667	0.7500	0.6667
60	0.6667	0.6667	0.6667	0.7500	0.6667	0.6667	0.5833	0.6667
80	0.5833	0.6667	0.5000	0.5833	0.6667	0.4167	1.0000	0.1667
100	0.6667	0.5833	0.5000	0.5000	0.2500	0.4167	0.6667	0.2500

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.8750	1.1351	1.2293	0.9553	1.4260	14.292	8				
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*		0.8229	1.0000
10	0.8750	1.1351	1.2284	1.0472	1.4260	13.195	8	81.00	46.00	0.8229	1.0000
20	0.8125	1.0541	1.1334	0.9553	1.2780	10.875	8	73.00	46.00	0.8125	0.9873
40	0.7396	0.9595	1.0663	0.7854	1.4260	23.739	8	64.50	46.00	0.7396	0.8987
60	0.6667	0.8649	0.9560	0.8691	1.0472	4.980	8	52.50	46.00	0.6667	0.8101
80	0.5729	0.7432	0.8728	0.4205	1.4260	32.438	8	50.00	46.00	0.5729	0.6962
*100	0.4792	0.6216	0.7624	0.5236	0.9553	22.425	8	42.00	46.00	0.4792	0.5823

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.88687	1.035	0.34323	1.05003
Bartlett's Test indicates unequal variances (p = 4.74E-03)	18.6798	12.5916		
The control means are not significantly different (p = 0.17)	1.43406	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	80	100	89.4427	
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	28.429	10.633	14.213	46.527	0.3060
IC10	39.714	10.479	18.425	53.605	-0.2091
IC15	51.000	11.137	28.728	66.001	0.1564
IC20	61.778	11.915	37.188	84.191	-0.1235
IC25	70.556	9.449	59.523	88.841	-0.2044
IC40	96.889				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	7/15/2011	Test ID:	erm0.5em	Sample ID:	ERM 0.5
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water; ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.7500	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	1.0000	0.7500	0.9167	0.7500	0.9167	0.7500	1.0000	0.9167
20	0.6667	0.8333	0.6667	0.8333	0.9167	0.8333	0.7500	0.8333
40	1.0000	0.5000	0.5000	0.8333	1.0000	0.6667	0.7500	0.6667
60	0.5833	0.6667	0.6667	0.7500	0.6667	0.5833	0.5833	0.6667
80	0.5833	0.6667	0.5000	0.5833	0.6667	0.3333	0.5833	0.1667
100	0.6667	0.5833	0.5000	0.5000	0.2500	0.4167	0.6667	0.2500

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.8646	1.1216	1.2164	0.9553	1.4260	15.275	8				
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*		0.8229	1.0000
10	0.8750	1.1351	1.2284	1.0472	1.4260	13.195	8	81.00	46.00	0.8229	1.0000
20	0.7917	1.0270	1.1046	0.9553	1.2780	10.049	8	70.00	46.00	0.7917	0.9620
40	0.7396	0.9595	1.0663	0.7854	1.4260	23.739	8	64.50	46.00	0.7396	0.8987
60	0.6458	0.8378	0.9345	0.8691	1.0472	6.678	8	50.50	46.00	0.6458	0.7848
*80	0.5104	0.6622	0.7924	0.4205	0.9553	23.385	8	43.50	46.00	0.5104	0.6203
*100	0.4792	0.6216	0.7624	0.5236	0.9553	22.425	8	42.00	46.00	0.4792	0.5823

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.92573	1.035	-0.0268	-0.1103
Bartlett's Test indicates unequal variances (p = 0.05)	12.7512	12.5916		
The control means are not significantly different (p = 0.23)	1.26619	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	60	80	69.282	
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	23.800	10.663	13.580	45.066	0.4509
IC10	39.600	9.985	18.295	51.109	-0.2879
IC15	48.556	9.126	27.948	59.422	-0.6516
IC20	57.333	8.693	34.458	65.720	-1.1041
IC25	64.231	6.891	46.066	75.575	-1.1912
IC40	90.667				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Surv

Start Date:	7/15/2011	Test ID:	erm1.0em	Sample ID:	ERM 1.0
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.8333	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	0.6667	0.8333	0.8333	0.8333	0.7500	0.9167	0.7500	
20	0.7500	0.8333	0.8333	0.6667	0.5833	0.8333	0.6667	0.8333
40	0.6667	0.6667	0.6667	0.6667	0.9167	0.7500	0.6667	0.7500
60	0.5833	0.6667	0.5000	0.5833	0.6667	0.8333	0.7500	0.8333
80	0.4167	0.3333	0.4167	0.3333	0.6667	0.2500	0.2500	0.5833
100	0.5000	0.6667	0.2500	0.4167	0.4167	0.2500	0.2500	0.3333

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.8750	1.1351	1.2293	0.9553	1.4260	14.292	8					
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*			0.7842	1.0000
10	0.7976	1.0347	1.1112	0.9553	1.2780	9.358	7	-0.239	2.481	0.1844	0.7842	1.0000
20	0.7500	0.9730	1.0535	0.8691	1.1503	10.809	8	0.557	2.481	0.1781	0.7500	0.9564
40	0.7188	0.9324	1.0186	0.9553	1.2780	11.065	8	1.042	2.481	0.1781	0.7188	0.9165
60	0.6771	0.8784	0.9727	0.7854	1.1503	13.779	8	1.681	2.481	0.1781	0.6771	0.8634
*80	0.4063	0.5270	0.6882	0.5236	0.9553	22.590	8	5.644	2.481	0.1781	0.4063	0.5180
*100	0.3854	0.5000	0.6663	0.5236	0.9553	22.965	8	5.950	2.481	0.1781	0.3854	0.4915

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.87482	1.035	0.43469	-0.0664
Bartlett's Test indicates equal variances (p = 0.62)	4.43014	12.5916		
The control means are not significantly different (p = 0.17)	1.43406	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	60	80	69.282		0.16044	0.20337	0.27684	0.02062	7.2E-09	6, 48
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	23.190	14.188	5.813	60.323	1.0218
IC10	46.214	16.601	11.566	63.123	-0.0862
IC15	60.775	12.618	18.319	65.885	-1.2904
IC20	63.670	7.170	44.876	68.605	-3.0006
IC25	66.566	3.800	56.658	71.577	-0.9594
IC40	75.253				
IC50	93.571				

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	7/15/2011	Test ID:	erm1.0em	Sample ID:	ERM 1.0
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.7500	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	0.6667	0.8333	0.8333	0.8333	0.7500	0.9167	0.7500	
20	0.7500	0.8333	0.8333	0.6667	0.5833	0.7500	0.6667	0.8333
40	0.6667	0.6667	0.6667	0.6667	0.9167	0.7500	0.6667	0.7500
60	0.5833	0.5833	0.5000	0.5833	0.6667	0.8333	0.7500	0.7500
80	0.4167	0.3333	0.4167	0.3333	0.6667	0.2500	0.2500	0.5833
100	0.5000	0.6667	0.2500	0.4167	0.4167	0.2500	0.2500	0.3333

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.8646	1.1216	1.2164	0.9553	1.4260	15.275	8					
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*			0.7842	1.0000
10	0.7976	1.0347	1.1112	0.9553	1.2780	9.358	7	-0.243	2.481	0.1815	0.7842	1.0000
20	0.7396	0.9595	1.0406	0.8691	1.1503	10.281	8	0.748	2.481	0.1753	0.7396	0.9431
40	0.7188	0.9324	1.0186	0.9553	1.2780	11.065	8	1.059	2.481	0.1753	0.7188	0.9165
60	0.6563	0.8514	0.9491	0.7854	1.1503	12.950	8	2.043	2.481	0.1753	0.6563	0.8368
*80	0.4063	0.5270	0.6882	0.5236	0.9553	22.590	8	5.734	2.481	0.1753	0.4063	0.5180
*100	0.3854	0.5000	0.6663	0.5236	0.9553	22.965	8	6.044	2.481	0.1753	0.3854	0.4915

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	1.03148	1.035	0.48436	0.06306
Bartlett's Test indicates equal variances (p = 0.55)	4.97606	12.5916		
The control means are not significantly different (p = 0.23)	1.26619	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	60	80	69.282		0.15776	0.19996	0.27162	0.01998	6.0E-09	6, 48
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	18.783	13.905	4.231	49.286	0.7102
IC10	44.143	15.748	8.462	61.344	-0.1793
IC15	56.690	12.637	17.012	63.976	-1.2981
IC20	62.310	7.155	40.488	67.377	-1.6804
IC25	65.446	4.636	50.609	71.280	-1.6515
IC40	74.857				
IC50	93.571				

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Surv

Start Date:	7/15/2011	Test ID:	erm2.5em	Sample ID:	ERM 2.5
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.8333	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	0.6667	0.8333	0.7500	0.6667	0.6667	0.9167	0.7500	0.7500
20	0.8333	0.5833	0.7500	0.7500	0.5833	0.7500	0.4167	0.4167
40	0.5000	0.7500	0.8333	0.9167	0.7500	0.5000	0.5000	0.6667
60	0.5833	0.2500	0.6667	0.2500	0.2500	0.3333	0.2500	0.5833
80	0.1667	0.4167	0.0833	0.4167	0.2500	0.0000	0.4167	0.1667
100	0.3333	0.1667	0.0833	0.5000	0.0833	0.1667	0.3333	0.0833

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.8750	1.1351	1.2293	0.9553	1.4260	14.292	8					
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*			0.7708	1.0000
10	0.7500	0.9730	1.0545	0.9553	1.2780	10.680	8	0.430	2.359	0.2138	0.7500	0.9730
20	0.6354	0.8243	0.9292	0.7017	1.1503	18.255	8	1.812	2.359	0.2138	0.6563	0.8514
40	0.6771	0.8784	0.9793	0.7854	1.2780	18.948	8	1.260	2.359	0.2138	0.6563	0.8514
*60	0.3958	0.5135	0.6754	0.5236	0.9553	27.933	8	4.612	2.359	0.2138	0.3958	0.5135
*80	0.2396	0.3108	0.4884	0.1448	0.7017	42.610	8	6.675	2.359	0.2138	0.2396	0.3108
*100	0.2188	0.2838	0.4670	0.2928	0.7854	39.715	8	6.911	2.359	0.2138	0.2188	0.2838

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.80836	1.035	0.17145	-0.9428
Bartlett's Test indicates equal variances (p = 0.84)	2.78547	12.5916		
The control means are not significantly different (p = 0.17)	1.43406	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	40	60	48.9898		0.19527	0.24751	0.5628	0.03287	1.5E-10	6, 49
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	11.889	8.600	3.229	41.203	2.0732
IC10	16.000	11.741	6.458	43.695	1.0476
IC15	40.080	12.823	9.687	46.008	0.0927
IC20	43.040	10.203	15.136	48.871	-1.3878
IC25	46.000	7.066	18.911	52.098	-2.4222
IC40	54.880	3.989	48.256	63.297	0.6493
IC50	61.333	5.290	53.512	71.672	0.6639

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	7/15/2011	Test ID:	erm2.5em	Sample ID:	ERM 2.5
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.7500	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	0.6667	0.6667	0.7500	0.6667	0.6667	0.9167	0.7500	0.5833
20	0.8333	0.5833	0.7500	0.7500	0.5833	0.7500	0.4167	0.4167
40	0.5000	0.6667	0.8333	0.9167	0.7500	0.5000	0.4167	0.6667
60	0.5833	0.2500	0.6667	0.2500	0.2500	0.3333	0.2500	0.5833
80	0.1667	0.4167	0.0833	0.4167	0.2500	0.0000	0.4167	0.1667
100	0.3333	0.1667	0.0833	0.5000	0.0833	0.1667	0.3333	0.0833

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.8646	1.1216	1.2164	0.9553	1.4260	15.275	8				
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*		0.7708	1.0000
10	0.7083	0.9189	1.0078	0.8691	1.2780	12.229	8	58.50	46.00	0.7083	0.9189
20	0.6354	0.8243	0.9292	0.7017	1.1503	18.255	8	53.50	46.00	0.6458	0.8378
40	0.6563	0.8514	0.9573	0.7017	1.2780	20.613	8	56.00	46.00	0.6458	0.8378
*60	0.3958	0.5135	0.6754	0.5236	0.9553	27.933	8	40.00	46.00	0.3958	0.5135
*80	0.2396	0.3108	0.4884	0.1448	0.7017	42.610	8	36.00	46.00	0.2396	0.3108
*100	0.2188	0.2838	0.4670	0.2928	0.7854	39.715	8	36.50	46.00	0.2188	0.2838

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.06755	1.035	0.20371	-0.899
Bartlett's Test indicates equal variances (p = 0.90)	2.16638	12.5916		
The control means are not significantly different (p = 0.23)	1.26619	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	40	60	48.9898	
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05*	6.167	8.423	2.345	40.305	2.2976
IC10	12.333	12.129	4.690	42.840	1.1617
IC15	18.500	14.050	7.035	46.963	0.0638
IC20	42.333	12.416	9.381	52.005	-0.8469
IC25	45.417	8.682	16.938	57.232	-1.7207
IC40	54.667	5.250	46.984	66.407	0.3070
IC50	61.333	5.833	53.333	73.126	0.1768

* indicates IC estimate less than the lowest concentration

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Surv

Start Date:	7/15/2011	Test ID:	erm3.5em	Sample ID:	ERM 3.5
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.8333	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	0.8333	0.8333	0.7500	0.7500	0.6667	0.7500	0.6667	0.8333
20	0.7500	0.5833	0.6667	0.5833	0.8333	0.6667	0.7500	0.6667
40	0.5000	0.8333	0.8333	0.6667	0.5833	0.5833	0.5000	0.5833
60	0.8333	0.6667	0.4167	0.4167	0.2500	0.5000	0.5000	0.4167
80	0.2500	0.2500	0.3333	0.5833	0.6667	0.2500	0.5000	0.5000
100	0.4167	0.5833	0.4167	0.2500	0.0833	0.0833	0.1667	0.0833

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.8750	1.1351	1.2293	0.9553	1.4260	14.292	8					
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*			0.7708	1.0000
10	0.7604	0.9865	1.0629	0.9553	1.1503	7.692	8	0.367	2.359	0.1965	0.7604	0.9865
20	0.6875	0.8919	0.9811	0.8691	1.1503	9.778	8	1.349	2.359	0.1965	0.6875	0.8919
40	0.6354	0.8243	0.9293	0.7854	1.1503	15.785	8	1.971	2.359	0.1965	0.6354	0.8243
*60	0.5000	0.6486	0.7881	0.5236	1.1503	24.051	8	3.665	2.359	0.1965	0.5000	0.6486
*80	0.4167	0.5405	0.6977	0.5236	0.9553	24.756	8	4.750	2.359	0.1965	0.4167	0.5405
*100	0.2604	0.3378	0.5119	0.2928	0.8691	43.812	8	6.980	2.359	0.1965	0.2604	0.3378

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.72987	1.035	0.44418	-0.2706
Bartlett's Test indicates equal variances (p = 0.13)	9.77449	12.5916		
The control means are not significantly different (p = 0.17)	1.43406	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	40	60	48.9898		0.17834	0.22605	0.35671	0.02776	1.2E-08	6, 49
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	13.857	6.768	3.500	25.362	1.1263
IC10	19.143	10.860	7.000	43.149	0.7179
IC15	32.400	12.733	11.000	54.541	0.2128
IC20	42.769	11.462	16.248	62.323	-0.2527
IC25	48.462	10.170	22.775	67.171	-0.3339
IC40	69.000	9.819	52.585	83.648	0.2433
IC50	84.000				

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	7/15/2011	Test ID:	erm3.5em	Sample ID:	ERM 3.5
End Date:	9/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-	1	2	3	4	5	6	7	8
LCS + ERW	1.0000	0.8333	0.6667	0.8333	1.0000	0.8333	0.7500	1.0000
ERS + ERW	0.7500	1.0000	0.8333	0.6667	0.5000	0.9167	0.8333	0.6667
10	0.8333	0.8333	0.7500	0.7500	0.6667	0.7500	0.6667	0.8333
20	0.7500	0.5833	0.6667	0.5833	0.8333	0.6667	0.7500	0.6667
40	0.5000	0.8333	0.8333	0.6667	0.5833	0.5833	0.5000	0.5833
60	0.8333	0.5833	0.4167	0.4167	0.2500	0.5000	0.3333	0.4167
80	0.2500	0.2500	0.3333	0.5000	0.5833	0.2500	0.5000	0.5000
100	0.4167	0.5833	0.4167	0.2500	0.0833	0.0833	0.1667	0.0833

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.8646	1.1216	1.2164	0.9553	1.4260	15.275	8					
ERS + ERW	0.7708	1.0000	1.0935	0.7854	1.4260	18.494	8	*			0.7708	1.0000
10	0.7604	0.9865	1.0629	0.9553	1.1503	7.692	8	0.376	2.359	0.1920	0.7604	0.9865
20	0.6875	0.8919	0.9811	0.8691	1.1503	9.778	8	1.380	2.359	0.1920	0.6875	0.8919
40	0.6354	0.8243	0.9293	0.7854	1.1503	15.785	8	2.018	2.359	0.1920	0.6354	0.8243
*60	0.4688	0.6081	0.7561	0.5236	1.1503	25.080	8	4.145	2.359	0.1920	0.4688	0.6081
*80	0.3958	0.5135	0.6764	0.5236	0.8691	21.389	8	5.124	2.359	0.1920	0.3958	0.5135
*100	0.2604	0.3378	0.5119	0.2928	0.8691	43.812	8	7.145	2.359	0.1920	0.2604	0.3378

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.85025	1.035	0.51872	0.00829
Bartlett's Test indicates equal variances (p = 0.13)	9.95009	12.5916		
The control means are not significantly different (p = 0.23)	1.26619	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	40	60	48.9898		0.17392	0.22044	0.37437	0.0265	2.9E-09	6, 49
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	13.857	7.747	3.564	38.506	1.3570
IC10	19.143	10.473	7.127	44.114	0.6918
IC15	32.400	11.075	11.105	47.986	-0.0938
IC20	42.250	9.853	16.856	56.020	-0.5415
IC25	46.875	7.971	29.917	62.208	-0.2498
IC40	61.714	8.910	50.569	81.803	0.6583
IC50	81.538				

ToxCalc v5.0.32

Reviewed by: DS

Appendix F
Hyalella azteca
28-Day Statistical Data

- Survival
- Weight

TVA: 5069-03

Emory River

Sample ID: GLW

Concentration: NA

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: NA	Test Photoperiod: 16:8
Sample ID: GLW(Glec Laboratory Water only)	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS

Date: 08/09/11

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 7 [illegible] 8/9/11

☒ 7:55 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

~~8/9~~ 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: [illegible]
1	—	—	—	—	—	—	0.04J	10/10
2	—	—	—	—	end: 24.8	end: 5.3		10/10
3	22.6	7.80	6.6	303	start: 21.4	start: 0.0		10/10
4	—	—	—	—	Titrant used (mL): 3.4	Titrant used (mL): 5.3		7/10
5	22.6	7.94	7.1	297	Sample volume (mL): 25	Sample volume (mL): 50		10/10
6	—	—	—	—	136	106		8/10
7	—	—	—	—	—	—	—	10/10
8	—	—	—	—	—	—	—	10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: LCS+GLW

Concentration: NA

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: Mur

GLC#: NA	Test Photoperiod: 16:8
Sample ID: LCS+GLW(Laboratory Control Sediment + Glec Laboratory Water)	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 23 DS 8/9/11

Date: 08/09/11

Overlying Water: Dechlor (Glec Laboratory Water)

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 2/1 Mur 8/9/11

☒ 75S AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* 8/9/11 AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	AD 7.40	4	6	113		4	8	Int: Mur
1	—						0.00 U	8/10
2	—				end: 28.3	end: 11.0		10/10
3	22.5	7.62	4.1	332	start: 24.8	start: 5.3		10/10
4	—				Titrant used (mL): 3.5	Titrant used (mL): 5.7		10/10
5	22.6	7.70	4.5	329	Sample volume (mL): 25	Sample volume (mL): 50		10/10
6	—				140	114		10/10
7	—							10/10
8	—							10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

TVA: 5069-03

Emory River

Sample ID: LCS+ERW

Concentration: NA

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: MW

GLC#: NA

Sample ID: LCS+ERW(Laboratory Control Sediment + Emory River Water)

Test Species: *Hyalella azteca*

Date Addition of Sediment: 7/11/2011

Test Initiation Date: 7/12/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: In house 7/6/2011 6-7 days

Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 21 MW 8/9/11

☒ 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

AD DS 7.22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ CB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) CB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: MW
1	—	—	—	—	—	—	0.05	9/10
2	—	—	—	—	end: 3.6	end: 45.1	J	10/10
3	22.6	7.06	3.2	127.7	start: 1.4	start: 42.7	/	10/10
4	—	—	—	—	Titrant used (mL): 2.2	Titrant used (mL): 2.4	/	10/10
5	22.6	7.09	3.3	128.9	Sample volume (mL): 25	Sample volume (mL): 50	/	9/10
6	—	—	—	—	88	48	/	10/10
7	—	—	—	—	—	—	—	10/10
8	—	—	—	—	—	—	—	10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

TVA: 5069-03

Emory River

Sample ID: ERM Reference

Concentration: NA

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8981

Sample ID: ERM Reference

Test Species: *Hyalella azteca*

Date Addition of Sediment: 7/11/2011

Test Initiation Date: 7/12/2011

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: In house 7/6/2011 6-7 days

Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 7 [illegible] 8/9/11

☒ 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:12 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	45	4	6	113		4	8	Int: [illegible]
1	—	—	—	—	—	30	0.04	10/10
2	—	—	—	—	end: 4.8	end: 1.7	J	9/10
3	22.6	6.95	5.2	91.7	start: 3.6	start: 0.2		9/10
4	—	—	—	—	Titrant used (mL): 1.2	Titrant used (mL): 1.5		10/10
5	22.6	6.95	5.2	91.5	Sample volume (mL): 25	Sample volume (mL): 50		8/10
6	—	—	—	—	48	DUP 3.3 / 1.7		10/10
7	—	—	—	—	—	1.6		10/10
8	—	—	—	—	—	32		10/10

Hardness duplicate

end: 21.4
start: 20.2
used: 1.2
48

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 1.0
Concentration: 10%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984
Sample ID: ERM 1.0 Concentration: 10%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 7/11/2011
Test Initiation Date: 7/12/2011

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Termination Date: 8/9/2011

Test Day: Day ~~28~~ 28 8/9/11 DS
Date: 08/09/11
Overlying Water: Emory River Water
Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 21 [illegible] 8/9/11
X 0736 AD Renewal time/initials ☐ — Renewal time/initials
☐ — Renewal time/initials ☐ — Renewal time/initials
Food: YTC# — ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☒ n/a

X DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: [illegible]
1	—					—	0.03	10/10
2	—			—	end: 5.9	end: 5.0	U	10/10
3	22.6	7.01	5.1	93.8	start: 4.8	start: 3.3	/	9/~~10~~ 10 [illegible] 8/9/11
4	—			—	Titrant used (mL): 1.1	Titrant used (mL): 1.7	/	10/10
5	22.6	6.98	4.8	94.4	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	—			—	(44)	(34)	/	10/10
7	—					—		9/10
8	—					—		10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

TVA: 5069-03

Emory River

Sample ID: ERM 1.0

Concentration: 20%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 4 [illegible] 8/9/11

☒ 0730AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: [illegible]
1	—						0.01	10/10
2	—				end: 7.0	end: 6.6	U	10/10
3	22.6	7.06	4.8	99.6	start: 5.9	start: 5.0	/	8/10
4	—				Titrant used (mL): 1.1	Titrant used (mL): 1.6	/	10/10
5	22.6	7.07	4.8	98.3	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	—				44	32	/	10/10
7	—						—	10/10
8	—						—	8/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 1.0
Concentration: 40%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: mw

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~7~~ 1 mw 8/9/11

~~X~~ 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ~~X~~ n/a

DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: mw
1	—						0.02	10/10
2	—				end: 8.2	end: 8.5		10/10
3	22.6	7.08	4.8	97.0	start: 7.0	start: 6.6		10/10
4	—				Titrant used (mL): 1.2	Titrant used (mL): 1.9		9/10
5	22.6	7.13	5.4	102.4	Sample volume (mL): 25	Sample volume (mL): 50		10/10
6	—				48	38		10/10
7	—							10/10
8	—							10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 1.0
Concentration: 60%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~2~~ 1 [illegible] 8/9/11

☒ 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: [illegible]
1	—					—	0.01	10/10
2	—				end: 9.6	end: 10.6	/	10/10
3	22.6	7.51	4.9	~~4.9~~ DS 8/9/11 117.8	start: 8.2	start: 8.5	/	10/10
4	—				Titrant used (mL): 1.4	Titrant used (mL): 2.1	/	10/10
5	~~22.5~~ 22.6 DS 8/9/11	7.26	5.4	105.4	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	—				56	42	/	8/10
7	—					—		10/10
8	—					—		10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 1.0
Concentration: 80%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: NW

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: ~~Day 20~~ 8/9/11 D5 28

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 8 NW 8/9/11

~~X~~ 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

~~X~~ DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ eB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) eB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: NW
1	—	—	—	—		—	0.46	10/10
2	—	—	—	—	end: 11.0	end: 12.7	/	8/10
3	22.6	7.33	5.2	113.3	start: 9.6	start: 10.6	/	10/10
4	—	—	—	—	Titrant used (mL): 1.4	Titrant used (mL): 2.1	/	10/10
5	22.6	7.45	5.5	115.4	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	—	—	—	—	(56)	(42)	/	7/10
7	—	—	—	—	—	—	—	8/10
8	—	—	—	—	—	—	—	10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 1.0
Concentration: 100%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: nw

GLC#: 8984	Test Photoperiod: 16:8
Sample ID: ERM 1.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~2~~ 1 nw 8/9/11

X 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

X DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: nw
1	—	—	—	—		—	0.02	10/10
2	22.6	—	—	—	end: 12.4	end: 15.0	/	10/10
3	~~22.5~~ DS 8/9/11	7.62	5.9	127.9	start: 11.0	start: 12.7	/	8/10
4	—	—	—	—	Titrant used (mL): 1.4	Titrant used (mL): 2.3	/	8/10
5	22.6	7.70	5.1	127.7	Sample volume (mL): 25	Sample volume (mL): 50	/	8/10
6	—	—	—	—	56	46	/	8/10
7	—	—	—	—	—	—	—	10/10
8	—	—	—	—	—	—	—	10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 2.5
Concentration: 10%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: Mur

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11	Number Daily Renewals: 21 Mur 8/9/11
Date: 08/09/11	A0730AD Renewal time/initials ☐ — Renewal time/initials
Overlying Water: Emory River Water	☐ — Renewal time/initials ☐ — Renewal time/initials
Overlying Water Batch ID (GLC Number): 9032	Food: YTC# — ☐ Feed 1.0 ml/replicate
	Screens Cleaned: ☐ yes ☐ no ☒ n/a

DS 7/22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ CB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) CB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4 8/3/11 8		Int: Mur
1	—					—	0.04J	10/10
2	—				end: 13.6	end: 16.7		9/10
3	22.6	7.08	5.4	98.8	start: 12.4	start: 15.0		9/10
4	—				Titrant used (mL): 1.2	Titrant used (mL): 1.7		10/10
5	22.6	7.05	5.0	98.7	Sample volume (mL): 25	Sample volume (mL): 50		9/10
6	—				48	34		9~~8~~/10 Mur 8/9/11
7	—							10/10
8	—							10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 2.5
Concentration: 20%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~2~~ 1 [illegible] 8/9/11

~~X~~ 0730AD Renewal time/initials □ — Renewal time/initials

□ — Renewal time/initials □ — Renewal time/initials

Food: YTC# — □ Feed 1.0 ml/replicate

Screens Cleaned: □ yes □ no ☒ n/a

~~X~~ DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ CB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) CB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: [illegible]
1	—					—	0.000	10/10
2	—			—	end: 14.8	end: 18.6	/	10/10
3	22.6	7.20	5.2	106.0	start: 13.6	start: 16.7	/	10/10
4	—			—	Titrant used (mL): 1.2	Titrant used (mL): 1.9	/	10/10
5	22.6	7.17	5.0	102.8	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	—			—	(48)	(38)	/	10/10
7	—			—		—		10/10
8	—			—		—		10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 40%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: X / [illegible] 8/9/11

X 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

DS 7122 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: [illegible]
1	—						0.00	10/10
2	—				end: 16.1	end: 20.5		10/10
3	22.6	7.22	5.2	106.1	start: 14.8	start: 18.6		10/10
4	—				Titrant used (mL): 1.3	Titrant used (mL): 1.9		9/10
5	22.6	7.18	5.2	103.8	Sample volume (mL): 25	Sample volume (mL): 50		9/10
6	—				52	38		10/10
7	—							10/10
8	—							10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 2.5

Concentration: 60%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: NWS

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 21 NWS 8/9/11

☒ 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ CB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) CB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: NWS
1	—						0.00 U	8/10
2	—				end: 17.6	end: 22.5		8/10
3	22.6	7.38	5.7	112.1	start: 16.1	start: 20.5		8/10
4	—				Titrant used (mL): 1.5	Titrant used (mL): 2.0		10/10
5	22.6	7.27	5.5	107.1	Sample volume (mL): 25	Sample volume (mL): 50		10/10
6	—				60	40		10/10
7	—							9/10
8	—							8/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 2.5
Concentration: 80%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~2~~ 1 MW 8/9/11

☒ 0730 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: MW
1	—						0.00	10/10
2	—				end: 19.0	end: 24.5		10/10
3	22.7	7.34	5.8	107.2	start: 17.6	start: 22.5		6/10
4	—				Titrant used (mL): 1.4	Titrant used (mL): 2.0		6/10
5	22.6	7.28	5.8	108.3	Sample volume (mL): 25	Sample volume (mL): 50		8/10
6	—				56	40		9/10
7	—							8/10
8	—							9/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 2.5
Concentration: 100%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: NWS

GLC#: 8985	Test Photoperiod: 16:8
Sample ID: ERM 2.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS
Date: 08/09/11
Overlying Water: Emory River Water
Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 21 NWS 8/9/11
☒ 0730AD Renewal time/initials ☐ — Renewal time/initials
☐ — Renewal time/initials ☐ — Renewal time/initials
Food: YTC# — ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☒ n/a

DS 7:22 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	40	4	6	113		4	8	Int: NWS
1	—	—	—	—	—	—	0.00 U	6 8/10 NWS 8/9/11
2	—	—	—	—	end: 20.2	end: 26.3	/	6 9/10 NWS 8/9/11
3	22.6	7.25	5.3	105.8	start: 19.0	start: 24.5		3/10
4	—	—	—	—	Titrant used (mL): 1.2	Titrant used (mL): 1.8		3/10
5	22.7	7.37	6.2	105.1	Sample volume (mL): 25	Sample volume (mL): 50		7/10
6	—	—	—	—	48	36		2/10
7	—	—	—	—	—	—	—	4/10
8	—	—	—	—	—	—	—	6/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 10%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~28~~ 28 8/9/11 DS

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 21 [illegible] 8/9/11

~~7:55 AD~~ Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

~~AD~~ 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: [illegible]
1	—						0.00	9/10
2	—				end: 29.6	end: 12.6		10/10
3	22.5	7.07	4.9	99.0	start: 28.3	start: 11.0		9/10
4	—				Titrant used (mL): 1.3	Titrant used (mL): 1.6		10/10
5	22.6	7.02	5.1	96.4	Sample volume (mL): 25	Sample volume (mL): 50		10/10
6	—				52	32		10/10
7	—							7/10
8	—							10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 3.5
Concentration: 20%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: NW

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS
Date: 08/09/11
Overlying Water: Emory River Water
Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 21 NW 8/9/11
~~X~~ 755 AD Renewal time/initials ☐ — Renewal time/initials
☐ — Renewal time/initials ☐ — Renewal time/initials
Food: YTC# — ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☒ n/a

~~X~~ DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: NW
1	—	—	—	—		—	0.00 U	8/10
2	—	—	—	—	end: 30.7	end: 14.6		10/10
3	22.6	7.10	5.2	97.9	start: 29.6	start: 12.8		10/10
4	—	—	—	—	Titrant used (mL): 1.1	Titrant used (mL): 1.8		10/10
5	22.6	7.18	5.7	92.1	Sample volume (mL): 25	Sample volume (mL) 50		10/10
6	—	—	—	—	44	36		9/10
7	—	—	—	—				10/10
8	—	—	—	—				10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 3.5
Concentration: 40%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 DS 8/9/11
Date: 08/09/11
Overlying Water: Emory River Water
Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~2~~ 1 [illegible] 8/9/11
☒ TSS AD Renewal time/initials ☐ — Renewal time/initials
☐ — Renewal time/initials ☐ — Renewal time/initials
Food: YTC# — ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: [illegible]
1	—	—	—	—	—	—	0.00	10/10
2	—	—	—	—	end: 31.9	end: 16.4		10/10
3	22.6	7.20	5.4	102.9	start: 30.7	start: 14.6		10/10
4	—	—	—	—	Titrant used (mL): 1.2	Titrant used (mL): 1.8		10/10
5	22.6	7.22	6.2	99.5	Sample volume (mL): 25	Sample volume (mL): 50		9/10
6	—	—	—	—	48	36		9/10
7	—	—	—	—	—	—	—	8/10
8	—	—	—	—	—	—	—	6/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 3.5
Concentration: 60%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: MWB

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

DS 8/9/11
Test Day: Day ~~20~~ 28
Date: 08/09/11
Overlying Water: Emory River Water
Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~2~~ 1 MWB 8/9/11
~~X~~ 755 AD Renewal time/initials ☐ — Renewal time/initials
☐ — Renewal time/initials ☐ — Renewal time/initials
Food: YTC# — ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ~~X~~ n/a

~~X~~DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: MWB
1	—						0.00	9/10
2	—				end: 33.1	end: 18.4		9/10
3	22.6	7.31	5.8	107.0	start: 31.9	start: 16.4		8/10
4	—				Titrant used (mL): 1.2	Titrant used (mL): 2.0		8/10
5	22.6	7.43	5.4	115.9	Sample volume (mL): 25	Sample volume (mL): 50		9/10
6	—				48	40		9/10
7	—							9/10
8	—							10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

TVA: 5069-03

Emory River

Sample ID: ERM 3.5

Concentration: 80%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

DS 8/9/11

Test Day: Day ~~20~~ 28

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 1 MW 8/9/11

~~RO~~ 755 AD Renewal time/initials □ — Renewal time/initials

□ Renewal time/initials □ — Renewal time/initials

Food: YTC# — □ Feed 1.0 ml/replicate

Screens Cleaned: □ yes □ no ☒ n/a

DS 7:55 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: MW
1	—						0.00	✓ 9/10
2	—				end: 34.4	end: 20.3		10/10
3	22.5	7.55	6.1	116.3	start: 33.1	start: 18.4		10/10
4	—				Titrant used (mL): 1.3	Titrant used (mL): 1.9		8/10
5	22.6	7.48	6.0	111.9	Sample volume (mL): 25	Sample volume (mL): 50		8/10
6	—				52	38		9/10
7	—							10/10
8	—							10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 3.5
Concentration: 100%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8987	Test Photoperiod: 16:8
Sample ID: ERM 3.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 2/1 MW 8/9/11

X 0755 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

AD 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: MW
1	—	—	—	—	—	—	0.00	5/10
2	—	—	—	—	end: 35.8	end: 22.1		6/10
3	22.6	7.29	5.9	104.3	start: 34.4	start: 20.3		6/10
4	—	—	—	—	Titrant used (mL): 1.4	Titrant used (mL): 1.8		5/10
5	22.6	7.37	6.3	106.2	Sample volume (mL): 25	Sample volume (mL): 50		6/10
6	—	—	—	—	56	36		7/10
7	—	—	—	—	—	—	—	7/10
8	—	—	—	—	—	—	—	5/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

TVA: 5069-03

Emory River

Sample ID: ERM 5.5

Concentration: 10%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8989	Test Photoperiod: 16:8
Sample ID: ERM 5.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: 21 [illegible] 8/9/11

☒ 0755 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: [illegible]
1	—					—	0.00	9/10
2	—				end: 37.0	end: 23.8		8/10
3	22.7	7.12	4.7	101.7	start: 35.8	start: 22.1		10/10
4	—				Titrant used (mL): 1.2	Titrant used (mL): 1.7		9/10
5	22.7	6.98	4.6	92.1	Sample volume (mL): 25	Sample volume (mL) 50		10/10
6	—				48	34		10/10
7	—					DUP 40.4 39.2		10/10
8	—				—	34 1.7		10/10

Duplicate Hardness

end: 44.8
start: 43.6
used: 1.2

48

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 5.5
Concentration: 20%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8989	Test Photoperiod: 16:8
Sample ID: ERM 5.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS	Number Daily Renewals: ~~2~~ 1 MW 8/8/11
Date: 08/09/11	~~X~~ 0755 AD Renewal time/initials ☐ — Renewal time/initials
Overlying Water: Emory River Water	☐ — Renewal time/initials ☐ — Renewal time/initials
Overlying Water Batch ID (GLC Number): 9032	Food: YTC# — ☐ Feed 1.0 ml/replicate
	Screens Cleaned: ☐ yes ☐ no ☒ n/a

DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ CB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) CB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: MW
1	—						0.00U	9/10
2	—				end: 38.2	end: 25.6		9/10
3	22.6	7.03	4.4	101.3	start: 37.0	start: 23.8		8/10
4	—				Titrant used (mL): 1.2	Titrant used (mL): 1.8		7/10
5	22.6	7.07	5.0	101.3	Sample volume (mL): 25	Sample volume (mL): 50		10/10
6	—				(48)	(36)		10/10
7	—							10/10
8	—							10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 5.5
Concentration: 40%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: MW

GLC#: 8989	Test Photoperiod: 16:8
Sample ID: ERM 5.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~20~~ 28 8/9/11 DS	Number Daily Renewals: 1 MW 8/9/11
Date: 08/09/11	☒ 0755 AD Renewal time/initials ☐ — Renewal time/initials
Overlying Water: Emory River Water	☐ — Renewal time/initials ☐ — Renewal time/initials
Overlying Water Batch ID (GLC Number): 9032	Food: YTC# — ☐ Feed 1.0 ml/replicate
	Screens Cleaned: ☐ yes ☐ no ☒ n/a

☒ DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: MW
1	—				—	—	0.00	10/10
2	—				end: 39.4	end: 33.8	/	10/10 MW 8/9/11
3	22.6	7.00	5.0	93.8	start: 38.2	start: 32.0	/	10/10
4	—				Titrant used (mL): 1.2	Titrant used (mL): 1.8	/	9/10
5	22.6	7.13	5.3	103.1	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	~~9~~ AD 9/27/11				(48)	(36)	/	9/10
7	—				—	—	—	10/10
8	—				—	—	—	10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC

TVA: 5069-03

Emory River

Sample ID: ERM 5.5

Concentration: 60%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8989	Test Photoperiod: 16:8
Sample ID: ERM 5.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~28~~ 28 (DS 8/9/11)

Date: 08/09/11

Overlying Water: Emory River Water

Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: [illegible] 8/8/11

X 0755 AD Renewal time/initials ☐ — Renewal time/initials

☐ — Renewal time/initials ☐ — Renewal time/initials

Food: YTC# — ☐ Feed 1.0 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☒ n/a

DS 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: [illegible]
1	—	—	—	—		—	0.00 V	10/10
2	—	—	—	—	end: 40.9	end: 35.6		10/10
3	22.6	7.17	5.2	101.5	start: 39.4	start: 33.8		10/10
4	—	—	—	—	Titrant used (mL): 1.5	Titrant used (mL): 1.8		10/10
5	22.6	7.20	5.7	79.4	Sample volume (mL): 25	Sample volume (mL): 50		9/10
6	—	—	—	—	60	36		9/10
7	—	—	—	—		DUP 42.7 40.9		10/10
8	—	—	—	—		36 1.8		10/10

Duplicate Hardness

end: 46.1

start: 44.8

used: 1.3

52

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 5.5
Concentration: 80%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8989	Test Photoperiod: 16:8
Sample ID: ERM 5.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: D5/8/9/11 Day ~~20~~ 28
Date: 08/09/11
Overlying Water: Emory River Water
Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: [illegible] 8/9/11
~~X~~ 0755 AD Renewal time/initials ☐ — Renewal time/initials
☐ — Renewal time/initials ☐ — Renewal time/initials
Food: YTC# — ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☒ n/a

~~X~~ D5 7:35 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AD	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	39	4	6	113		4	8	Int: [illegible]
1	—	—	—	—	—	—	0.00	9/10
2	—	—	—	—	end: 42.2	end: 37.4	/	10/10
3	22.6	7.27	5.7	107.4	start: 40.9	start: 35.6	/	10/10
4	—	—	—	—	Titrant used (mL): 1.3	Titrant used (mL): 1.8	/	10/10
5	22.6	7.21	5.4	103.3	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	~~7~~ AD 8/9/11	—	—	—	52	36	/	9/10
7	—	—	—	—	—	—	—	8/10
8	—	—	—	—	—	—	—	7/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Emory River

Sample ID: ERM 5.5
Concentration: 100%

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

QC'd by: [illegible]

GLC#: 8989	Test Photoperiod: 16:8
Sample ID: ERM 5.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 7/11/2011	Test Organism Source/Age: In house 7/6/2011 6-7 days
Test Initiation Date: 7/12/2011	Test Termination Date: 8/9/2011

Test Day: Day ~~28~~ 28 8/9/11 DS
Date: 08/09/11
Overlying Water: Emory River Water
Overlying Water Batch ID (GLC Number): 9032

Number Daily Renewals: ~~7~~ 1 [illegible] 8/9/11
~~X~~ 0755 AP Renewal time/initials ☐ — Renewal time/initials
☐ — Renewal time/initials ☐ — Renewal time/initials
Food: YTC# — ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ~~☒~~ n/a

~~*~~ DS 7135 chemistries time/Initial

Replicate	Temperature (23± 1°C)* AP	pH	Dissolved Oxygen (mg/L)*	Specific Conductance (µmhos/cm)	Hardness mg/L $CaCO_3$ EB	Alkalinity mg/L $CaCO_3$ TB	Ammonia (as N) EB	Observations/ 10 organisms per replicate
Meter ID	29	4	6	113		4	8	Int: [illegible]
1	—						0.00 U	10/10
2	—				end: 43.6	end: 39.1	/	8/10
3	22.6	7.27	5.6	108.7	start: 42.2	start: 37.4	/	8/10
4	—				Titrant used (mL): 1.4	Titrant used (mL): 1.7	/	10/10
5	22.7	7.25	5.7	106.5	Sample volume (mL): 25	Sample volume (mL): 50	/	10/10
6	—				56	34	/	10/10
7	—							10/10
8	—							10/~~8~~ 10 [illegible] 8/9/11

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

Observations Key: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: GLW

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:44
Date/Time out: 8/10/2011 11:44

Dessicator
Date/Time in: 8/10/2011 11:44
Date/Time out: 8/10/2011 12:52

QC'd by: [illegible]

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C TB Total Dry Weight of Organisms (g)	D TB Number of Organisms Weighed	B-C/D TB Average Weight (mg)	B-C/A TB Biomass Weight (mg)
Sample ID:	1	10	0.81300	0.80971	0.00329	10	0.32900	0.32900
DS 8/10/11	2	10	0.81073	0.80723	0.00350	10	0.35000	0.35000
GLW	3	10	0.81671	0.81389	0.00282	10	0.28200	0.28200
GLEC Number:	4	10	0.81096	0.80849	0.00247	7	0.35286	0.24700
NA	5	10	0.81508	0.81243	0.00265	10	0.26500	0.26500
	6	10	0.81929	0.81587	0.00342	8	0.42750	0.34200
	7	10	0.80591	0.80358	0.00233	10	0.23300	0.23300
	8	10	0.80815	0.80512	0.00303	10	0.30300	0.30300
						AVERAGE:	0.31780	0.29388

Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: LCS+GLW

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:44
Date/Time out: 8/10/2011 11:44

Dessicator
Date/Time in: 8/10/2011 11:44
Date/Time out: 8/10/2011 13:03

QC'd by: nws

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C TB Total Dry Weight of Organisms (g)	D TB Number of Organisms Weighed	B-C/D TB Average Weight (mg)	B-C/A TB Biomass Weight (mg)
Sample ID: LCS+GLW	1	10	0.80752	0.80268	0.00484	8	0.60500	0.48400
	2	10	0.81553	0.80822	0.00731	10	0.73100	0.73100
GLEC Number: NA	3	10	0.81443	0.80765	0.00678	10	0.67800	0.67800
	4	10	0.80921	0.80294	0.00627	10	0.62700	0.62700
	5	10	0.81260	0.80888	0.00372	10	0.37200	0.37200
	6	10	0.81007	0.80463	0.00544	10	0.54400	0.54400
	7	10	0.80712	0.80253	0.00459	10	0.45900	0.45900
	8	10	0.81426	0.80933	0.00493	10	0.49300	0.49300
						AVERAGE:	0.56363	0.54850

GLEC

Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: LCS+ERW

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:44
Date/Time out: 8/10/2011 11:45

Dessicator
Date/Time in: 8/10/2011 11:44
Date/Time out: 8/10/2011 13:13

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C TB Total Dry Weight of Organisms (g)	D TB Number of Organisms Weighed	B-C/D TB Average Weight (mg)	B-C/A TB Biomass Weight (mg)
Sample ID: LCS+ERW	1	10	0.81313	0.80813	0.00500	9	0.55556	0.50000
	2	10	0.80480	0.80030	0.00450	10	0.45000	0.45000
GLEC Number: NA	3	10	0.80684	0.80321	0.00363	10	0.36300	0.36300
	4	10	0.80862	0.80333	0.00529	10	0.52900	0.52900
	5	10	0.81172	0.80789	0.00383	9	0.42556	0.38300
	6	10	0.81407	0.80925	0.00482	10	0.48200	0.48200
	7	10	0.81890	0.81395	0.00495	10	0.49500	0.49500
	8	10	0.81886	0.81279	0.00607	10	0.60700	0.60700
						AVERAGE:	0.48839	0.47613

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERS-ERW

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:44
Date/Time out: 8/10/2011 11:45

Dessicator
Date/Time in: 8/10/2011 11:44
Date/Time out: 8/10/2011 12:41

QC'd by: nw

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g) TB	D Number of Organisms Weighed TB	B-C/D Average Weight (mg) TB	B-C/A Biomass Weight (mg) TB
Sample ID: ERS-ERW	1	10	0.81586	0.81210	0.00376	10	0.37600	0.37600
	2	10	0.81661	0.81269	0.00392	9	0.43556	0.39200
GLEC Number: 8981	3	10	0.80978	0.80619	0.00359	9	0.39889	0.35900
	4	10	0.80615	0.80265	0.00350	10	0.35000	0.35000
	5	10	0.81776	0.81342	0.00434	8	0.54250	0.43400
	6	10	0.80806	0.80413	0.00393	10	0.39300	0.39300
	7	10	0.80907	0.80470	0.00437	10	0.43700	0.43700
	8	10	0.81339	0.81078	0.00261	10	0.26100	0.26100
						AVERAGE:	0.39924	~~0.37600~~ 0.37525 nw 10/10/11

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM1.0 – 10%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:25
Date/Time out: 8/10/2011 11:25

Dessicator
Date/Time in: 8/10/2011 11:25
Date/Time out: 8/10/2011 13:33

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D TB Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM1.0 10% GLEC Number: 8984	1	10	0.80725	0.80310	0.00415	10	0.41500	0.41500
	2	10	0.81756	0.81345	0.00411	10	0.41100	0.41100
	3	10	0.80966	0.80615	0.00351	9	0.39000	0.35100
	4	10	0.81328	0.80991	0.00337	10	0.33700	0.33700
	5	10	0.81850	0.81523	~~0.818~~ 0.00327 DS 8/10/11	10	0.32700	0.32700
	6	10	0.81884	0.81469	0.00415	10	0.41500	0.41500
	7	10	0.80903	0.80496	0.00407	9	0.45222	0.40700
	8	10	0.80706	0.80318	0.00388	10	0.38800	0.38800
						AVERAGE:	0.39190	0.38138

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 1.0 – 2.0%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:25
Date/Time out: 8/10/2011 11:25

Dessicator
Date/Time in: 8/10/2011 11:~~49~~ 25 DS 8/10/11
Date/Time out: 8/10/2011 13:48

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D TB Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 1.0 2.0% GLEC Number: 8984	1	10	0.81049	0.80679	0.00370	10	0.37000	0.37000
	2	10	0.80749	0.80381	0.00368	10	0.36800	0.36800
	3	10	0.80421	0.80071	0.00350	8	0.43750	0.35000
	4	10	0.81059	0.80646	0.00413 ~~8~~ 3 DS 8/10/11	10	0.41300	0.41300
	5	10	0.80203	0.79950	0.00253	10	0.25300	0.25300
	6	10	0.81684	0.81325	0.00359	10	0.35900	0.35900
	7	10	0.80649	0.80284	0.00365	10	0.36500	0.36500
	8	10	0.81017	0.80704	0.00313	8	0.39125	0.31300
						AVERAGE:	0.36959	0.34888

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 1.0 40%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011
Date/Time out: 8/10/2011

Dessicator
Date/Time in: 8/10/2011 11:25
Date/Time out: 8/10/2011 14:00

QC'd by: NWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C TB Total Dry Weight of Organisms (g)	D TB Number of Organisms Weighed	B-C/D TB Average Weight (mg)	B-C/A TB Biomass Weight (mg)
Sample ID: ERM 1.0 40% GLEC Number: 8984	1	10	0.81060	0.80755	0.00305	10	0.30500	0.30500
	2	10	0.80830	0.80500	0.00330	10	0.33000	0.33000
	3	10	0.80623	0.80346	0.00277	10	0.27700	0.27700
	4	10	0.80723	0.80240	0.00483	9	0.53667	TB 8/10/11 ~~0.00~~ 0.48300
	5	10	0.80925	0.80345	0.00580	10	0.58000	0.58000
	6	10	0.81066	0.80747	0.00319	10	0.31900	0.31900
	7	10	0.80850	0.80419	0.00431	10	0.43100	0.43100
	8	10	0.81191	0.80874	0.00317	10	0.31700	0.31700
						AVERAGE:	0.38696	0.38025

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 1.0 60 %

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011
Date/Time out: 8/10/2011

Dessicator
Date/Time in: 8/10/2011 11:25
Date/Time out: 8/10/2011 14:21

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C TB Total Dry Weight of Organisms (g)	D TB Number of Organisms Weighed	B-C/D TB Average Weight (mg)	B-C/A TB Biomass Weight (mg)
Sample ID: ERM 1.0 60 % GLEC Number: 8984	1	10	0.81221	0.80920	0.00301	10	0.30100	0.30100
	2	10	0.81787	0.81527	0.00260	10	0.26000	0.26000
	3	10	0.81303	0.81000	0.00303	10	0.30300	0.30300
	4	10	0.81316	0.80955	0.00361	10	0.36100	0.36100
	5	10	0.80064	0.79709	0.00355	10	0.35500	0.35500
	6	10	0.80563	0.80242	0.00321	8	0.40125	TB 8/10/11 ~~0.4~~ 0.32100
	7	10	0.81606	0.81216	0.00390	10	0.39000	0.39000
	8	10	0.79720	0.79337	0.00383	10	0.38300	0.38300
						AVERAGE:	0.34428	0.33425

GLEC

Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 1.0 80%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:25
Date/Time out: 8/10/2011 11:25

Dessicator
Date/Time in: 8/10/2011 11:25
Date/Time out: 8/10/2011 14:07

QC'd by: [illegible]

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 1.0 80% GLEC Number: 8984	1	10	0.80225	0.79930	0.00295	10	0.29500	0.29500
	2	10	0.80432	0.80078	0.00354	8	0.44250	0.35400
	3	10	0.80926	0.80736	0.00190	10	0.19000	0.19000
	4	10	0.80483	0.80215	0.00268	10	0.26800	0.26800
	5	10	0.80218	0.79942	0.00276	10	0.27600	0.27600
	6	10	0.81089	0.80882	0.00207	7	0.29571	0.20700
	7	10	0.80387	0.80107	0.00280	8	0.35000	0.28000
	8	10	0.80683	0.80352	0.00331	10	0.33100	0.33100
						AVERAGE:	0.30603	0.27513

GLEC

Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 1.0 100%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 11:25
Date/Time out: 8/10/2011 11:25

Dessicator
Date/Time in: 8/10/2011 11:25
Date/Time out: 8/10/2011 13:56

QC'd by: [illegible]

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C KN Total Dry Weight of Organisms (g)	D KN Number of Organisms Weighed	B-C/D Average Weight (mg) KN	B-C/A Biomass Weight (mg) KN
Sample ID: ERM 1.0 100% GLEC Number: 8984	1	10	0.80221	0.79997	0.00224	10	0.22400	0.22400
	2	10	0.81102	0.80831	0.00271	10	0.27100	0.27100
	3	10	0.80104	0.79890	0.00214	8	0.26750	0.21400
	4	10	0.80948	0.80688	0.00260	8	0.32500	0.26000
	5	10	0.80540	0.80322 ~~0.80338~~ DS 8/10/11	0.00218	8	0.27250	0.21800
	6	10	0.81797	0.81504	0.00293	8	0.36625	0.29300
	7	10	~~0.79~~ DS 0.79701 8/10/11	0.79394	0.00307	10	0.30700	0.30700
	8	10	0.81425	0.81142	0.00283	10	0.28300	0.28300
						AVERAGE:	0.28953	0.25875

GLEC

Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM2.5 10%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 13:04
Date/Time out: 8/10/2011 13:13

Dessicator
Date/Time in: 8/10/2011 13:13
Date/Time out: 8/10/2011 14:42

QC'd by: MJS

KN

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM2.5 10% GLEC Number: 8985	1	10	0.80926	0.80572	0.00354	10	0.35400	0.35400
	2	10	0.81497	0.81232	0.00265	9	0.29444	0.26500
	3	10	0.80996	0.80748	0.00248	9	0.27556	0.24800
	4	10	0.80147	0.79849	0.00298	10	0.29800	0.29800
	5	10	0.80326	0.79996	0.00330	9	0.36667	0.33000
	6	10	0.81297	0.80997	0.00300	9	0.33333	0.30000
	7	10	0.81422	0.81095	0.00327	10	0.32700	0.32700
	8	10	0.80405	0.80096	0.00309	10	0.30900	0.30900
						AVERAGE:	0.31975	0.30388

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 2.5-20%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: MWS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1304
Date/Time out: 8/10/2011 1313

Dessicator
Date/Time in: 8/10/2011 ~~1543~~ 1313 MWS 8/10/11
Date/Time out: 8/10/2011 1543

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g) KN	D Number of Organisms Weighed KN	B-C/D Average Weight (mg) KN	B-C/A Biomass Weight (mg) KN
Sample ID: ERM 2.5-20%	1	10	0.80997	0.80702	0.00295	10	0.29500	0.29500
	2	10	0.80381	0.80019	0.00362	10	0.36200	0.36200
GLEC Number:	3	10	0.80410	0.80101	0.00309	10	0.30900	0.30900
8985	4	10	0.80962	0.80671 ~~0.80734~~ MWS 8/10/11	0.00291	10	0.29100	0.29100
	5	10	0.81229	0.80945	0.00284	10	0.28400	0.28400
	6	10	0.79635	0.79383	0.00252	10	0.25200	0.25200
	7	10	0.80364	0.80073	0.00291	10	0.29100	0.29100
	8	10	0.80473	0.80187	0.00286	10	0.28600	0.28600
						AVERAGE:	0.29625	0.29625

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 2.5 40%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 13:04
Date/Time out: 8/10/2011 13:13

Dessicator
Date/Time in: 8/10/2011 13:13
Date/Time out: 8/10/2011 14:42

QC'd by: KN

KN

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 2.5 40% GLEC Number: 8985	1	10	0.81483	0.81202	0.00281	10	0.28100	0.28100
	2	10	0.80912	0.80626	0.00286	10	0.28600	0.28600
	3	10	0.81375	0.81137	0.00238	10	0.23800	0.23800
	4	10	0.80414	0.80055	0.00359	9	0.39889	0.35900
	5	10	0.81073	0.80671	0.00402	9	0.44667	0.40200
	6	10	0.81048	0.80829	0.00219	10	0.21900	0.21900
	7	10	0.80441	0.80149	0.00292	10	0.29200	0.29200
	8	10	0.80454	0.80211	0.00243	10	0.24300	0.24300
						AVERAGE:	0.30057	0.29000

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 2.5 60%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 13:04
Date/Time out: 8/10/2011 13:13

Dessicator
Date/Time in: 8/10/2011 13:13
Date/Time out: 8/10/2011 14:42

QC'd by: MW

KN

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 2.5 60% GLEC Number: 8985	1	10	0.80780	0.86576	0.00204	8	0.25500	0.20400
	2	10	0.80517	0.80335	0.00182	8	0.22750	0.18200
	3	10	0.80438	0.80261	0.00177	8	0.22125	0.17700
	4	10	0.80857	0.80556	0.00301	10	0.30100	0.30100
	5	10	0.81910 ~~0.81073~~ 8/10/11 DS	0.81660 ~~0.80671~~	0.00250	10	0.25000	0.25000
	6	10	0.80405 ~~0.81048~~ 8/10/11 DS	0.80126 ~~0.80829~~	0.00279	10	0.27900	0.27900
	7	10	0.82289 ~~0.80441~~ 8/10/11 DS	0.82067 ~~0.80149~~ 8/10/11	0.00222	9	0.24667	0.22200
	8	10	0.82325 50 DS	0.82154	0.00196	8	0.24500	0.19600
						AVERAGE:	0.25~~443~~ 318	0.22638

8/10/11

KN 8/12/11

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 2.5 80%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: DS MWJ 8/10/11

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 13:04
Date/Time out: 8/10/2011 13:13

Dessicator
Date/Time in: 8/10/2011 13:13
Date/Time out: 8/10/2011 15:23

QC'd by: MWJ

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C KN Total Dry Weight of Organisms (g)	D KN Number of Organisms Weighed	B-C/D KN Average Weight (mg)	B-C/A KN Biomass Weight (mg)
Sample ID: ERM 2.5 80% GLEC Number: 8985	1	10	0.82000	0.81812	0.00188	10	0.18800	0.18800
	2	10	0.82287	0.82037	0.00250	10	0.25000	0.25000
	3	10	0.82218	0.82057	0.00161	6	0.26833	0.16100
	4	10	0.82520	0.82316	0.00204	6	0.34000	0.20400
	5	10	0.81653	0.81432	0.00221	8	0.27625	~~0.00022~~ 0.22100 KN 8/11/11
	6	10	0.81916	0.81718	0.00198	9	0.22000	0.19800
	7	10	0.82104	0.81926	0.00178	8	0.22250	0.17800
	8	10	0.81891	0.81656	0.00235	9	0.26111	0.23500
						AVERAGE:	0.25327	0.20438

GLEC

Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 2.5-100%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: MWS

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 13:04
Date/Time out: 8/10/2011 13:13

Dessicator
Date/Time in: 8/10/2011 13:13
Date/Time out: 8/10/2011 15:30

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C KN Total Dry Weight of Organisms (g)	D KN Number of Organisms Weighed	B-C/D KN Average Weight (mg)	B-C/A KN Biomass Weight (mg)
Sample ID: ERM 2.5-100% GLEC Number: 8985	1	10	0.81911	0.81813	0.00098	6	0.16333	0.09800
	2	10	0.82263	0.82176	0.00087	6	0.14500	0.08700
	3	10	0.82094	0.82047	0.00047	3	0.15667	0.04700
	4	10	0.82728	0.82686	0.00042	3	0.14000	0.04200
	5	10	0.82035	0.81943	0.00092	7	0.13143	0.09200
	6	10	0.82651	0.82603	0.00048	2	0.24000	0.04800
	7	10	0.82016	0.81884	0.00132	1	1.32000	0.13200
	8	10	0.82031	0.81918	0.00113	6	0.18833	0.11300
						AVERAGE:	0.31060	0.08238

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 3.5 10%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1430
Date/Time out: 8/10/2011 1430

Dessicator
Date/Time in: 8/10/2011 1430
Date/Time out: 8/10/2011 ~~1602~~ 17
8/10/11 KN

QC'd by: MW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 3.5 10%	1	10	0.82282	0.81767	0.00515	9	0.57222	0.51500
	2	10	0.81176	0.80760	0.00416	10	0.41600	0.41600
GLEC Number:	3	10	0.81129	0.80688	0.00441	10	0.44100	0.44100
8987	4	10	0.80849	0.80450	0.00399	10	0.39900	0.39900
	5	10	0.81407	0.81087	0.00320	10	0.32000	0.32000
	6	10	0.81316	0.81000	0.00316	10	0.31600	0.31600
	7	10	0.81553	0.81260	0.00293	7	0.41857	0.29300
	8	10	0.81010	0.80662	0.00348	10	0.34800	0.34800
						AVERAGE:	0.40385	0.38100

GLEC
Great Lakes Environmental Group

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 3.5 - 20%

Test Species: *H. azteca* _____

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: MW

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1420
Date/Time out: 8/10/2011 1420

Dessicator
Date/Time in: 8/10/2011 ~~1313~~ 1420 MW 8/10/11
Date/Time out: 8/10/2011 1551

QC'd by: MW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C KN Total Dry Weight of Organisms (g)	D KN Number of Organisms Weighed	B-C/D KN Average Weight (mg)	B-C/A KN Biomass Weight (mg)
Sample ID: ERM 3.5-20% GLEC Number: 8987	1	10	0.80983	0.80718	0.00265	8	0.33125	0.26500
	2	10	0.80496	0.80197	0.00299	10	0.29900	0.29900
	3	10	0.81544	0.81292	0.00252	10	0.25200	0.25200
	4	10	0.81164	0.80886	0.00278	10	0.27800	0.27800
	5	10	0.81740	0.81397	0.00343	10	0.34300	0.34300
	6	10	0.81302	0.80983	0.00319	9	0.35444	0.31900
	7	10	0.81020	0.80609	0.00411	10	0.41100	0.41100
	8	10	0.81488	0.81130	0.00358	10	0.35800	0.35800
						AVERAGE:	0.32834	0.31563

Great Lakes Environmental Center

Hyalella azteca WEIGHT DATA

Sample ID: ERM 3.5 40%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011 - 8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1430
Date/Time out: 8/10/2011 1430

Dessicator
Date/Time in: 8/10/2011 1430
Date/Time out: 8/10/2011 1623

QC'd by: MW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 3.5 40% GLEC Number: 8987	1	KN 8/10/11 ~~0~~ 10	0.80842	0.80573	0.00269	10	0.26900	0.26900
	2	10	0.81165	0.80795	0.00370	10	0.37000	0.37000
	3	10	0.81303	0.80951	0.00352	10	0.35200	0.35200
	4	10	0.80559	0.80307	0.00252	10	0.25200	0.25200
	5	10	0.81122	0.80798	0.00324	9	0.36000	0.32400
	6	10	0.81400	0.81134	0.00266	9	0.29556	0.26600
	7	10	0.81612	0.81323	0.00289	8	0.36125	0.28900
	8	10	0.80136	0.80021	0.00115	6	0.19167	0.11500
						AVERAGE:	0.30643 ~~35~~ 4	0.27963

8/15/11

Great Lakes Environmental Center

Hyalella azteca WEIGHT DATA

Sample ID: ERM 3.5 60%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011 – 8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1430
Date/Time out: 8/10/2011 1430

Dessicator
Date/Time in: 8/10/2011 1430
Date/Time out: 8/10/2011 1635

QC'd by: MWr

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 3.5 60% GLEC Number: 8987	1	10	0.81334	0.81092	0.00242	9	0.26889	0.24200
	2	10	0.81081	0.80885	0.00196	9	0.21778	0.19600
	3	10	0.79582	0.79326	0.00256	8	0.32000	0.25600
	4	10	0.80275	0.80072	0.00203	8	0.25375	0.20300
	5	10	0.81605	0.81406	0.00199	9	0.22111	0.19900
	6	10	0.81585	0.81402	0.00183	9	0.20333	0.18300
	7	10	0.80218	0.79991	0.00227	9	0.25222	0.22700
	8	10	0.80760	0.80676 62	0.00084 98	10	~~0.08400~~ 0.09800 MWr 9/18/11	~~0.08400~~ 0.08800 MWr 9/27/11
						AVERAGE:	~~0.22764~~ 0.22939 MWr 9/18/11	~~0.19875~~ 0.20050 MWr 9/27/11

KN 8/10/2011

MWr 9/18/11

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 3.5 80%

Test Species: *H. azteca* _____

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1430
Date/Time out: 8/10/2011 1430

Dessicator
Date/Time in: 8/10/2011 1430
Date/Time out: 8/10/2011 1649

QC'd by: NW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: KN 8/10/11 ~~8987~~ ERM 3.5 GLEC Number: 80% 8987	1	10	0.80973	0.80761	0.00212	9	0.23556	0.21200
	2	10	0.80492	0.80289	0.00203	10	0.20300	0.20300
	3	10	0.80724	0.80475	0.00249	10	0.24900	0.24900
	4	10	0.80550	0.80326	0.00224	8	0.28000	0.22400
	5	10	0.80421	0.80233	0.00188	8	0.23500	0.18800
	6	10	0.80283	0.80090	0.00193	9	0.21444	0.19300
	7	10	0.80903	0.80685	0.00218	10	0.21800	0.21800
	8	10	0.80767	0.80543	0.00224	10	0.22400	0.22400
						AVERAGE:	0.23238	0.21388

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 3.5 - 100%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: MW

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1420
Date/Time out: 8/10/2011 1420

Dessicator
Date/Time in: 8/10/2011 1420
Date/Time out: 8/10/2011 1460 8/10/11

QC'd by: MW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C KN Total Dry Weight of Organisms (g)	D KN Number of Organisms Weighed	B-C/D KN Average Weight (mg)	B-C/A KN Biomass Weight (mg)
Sample ID: ERM 3.5-100% GLEC Number: 8987	1	10	0.79481	0.79321	0.00160	5	0.32000	0.16000
	2	10	0.81390	0.81234	0.00156	6	0.26000	0.15600
	3	10	0.80755	0.80600	0.00155	6	0.25833	0.15500
	4	10	0.80799	0.80712	0.00087	5	0.17400	0.08700
	5	10	0.79873	0.79765	0.00108	6	0.18000	0.10800
	6	10	0.80631	0.80442	0.00189	7	0.27000	0.18900
	7	10	0.81548	0.81353	0.00195	7	0.27857	0.19500
	8	10	0.81031	0.80868	0.00163	5	0.32600	0.16300
						AVERAGE:	0.25836	0.15163

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 5.5 10%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1450
Date/Time out: 8/10/2011 1450

Dessicator
Date/Time in: 8/10/2011 1450
Date/Time out: 8/10/2011 1715

QC'd by: MWA

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 5.5 GLEC Number: 8989 10%	1	10	0.81124	0.80818	0.00306	9	0.34000	0.30600
	2	10	0.80858	0.80450	0.00408	8	0.51000	0.40800
	3	10	0.81426	0.81026	0.00400	10	0.40000	0.40000
	4	10	0.81245	0.80948	0.00297	9	0.33000	0.29700
	5	10	0.80756	0.80454	0.00302	10	0.30200	0.30200
	6	10	0.80537	0.80222	0.00315	10	0.31500	0.31500
	7	10	0.80414	0.79965	0.00449	10	0.44900	0.44900
	8	10	0.80838	0.80352	0.00486	10	0.48600	0.48600
						AVERAGE:	0.39150	0.37038

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 5.5 20%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1450
Date/Time out: 8/10/2011 1450

Dessicator
Date/Time in: 8/10/2011 1450
Date/Time out: 8/10/2011 1726

QC'd by: NW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 5.5 GLEC Number: 8989 20%	1	10	0.81507	0.81124	0.00383	9	0.42556	0.38300
	2	10	0.80842	0.80496	0.00346	9	0.38444	0.34600
	3	10	0.81015	0.80615	0.00400	8	0.50000	0.40000
	4	10	0.81435	0.81181	0.00254	7	0.36286	0.25400
	5	10	0.80946	0.80516	0.00430	10	0.43000	0.43000
	6	10	0.81555	0.81238	0.00317	10	0.31700	0.31700
	7	10	0.82259	0.81926	0.00333	10	0.33300	0.33300
	8	10	0.80444	0.80118	0.00326	10	0.32600	0.32600
						AVERAGE:	0.38486	0.34863

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 5.5 40%

Test Species: *H. azteca* _____

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1450
Date/Time out: 8/10/2011 1450

Dessicator
Date/Time in: 8/10/2011 1450
Date/Time out: 8/10/2011 1739

QC'd by: [illegible]

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 5.5 GLEC Number: 8989 40%	1	10	0.81076	0.80844	0.00232	10	0.23200	0.23200
	2	10	0.81760	0.81420	0.00340	10	0.34000	0.34000
	3	10	0.80649	0.80388	0.00261	10	0.26100	0.26100
	4	10	0.80242	0.79925	0.00317	9	0.35222	0.31700
	5	10	0.81490	0.81163	0.00327	10	0.32700	0.32700
	6	10	0.81024	0.80721	0.00303	9	0.33667	0.30300
	7	10	0.80266	0.79925	0.00341	10	0.34100	0.34100
	8	10	0.81156	0.80839	0.00317	10	0.31700	0.31700
						AVERAGE:	~~0.27128~~ 0.31336	0.30475

KN 8/11/11

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 5.5 60%

Test Species: *H. azteca* _____

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1450
Date/Time out: 8/10/2011 1450

Dessicator
Date/Time in: 8/10/2011 1450
Date/Time out: 8/10/2011 1750

QC'd by: MWS

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 5.5	1	10	0.80636	0.80341	0.00295	10	0.29500	0.29500
	2	10	0.80877	0.80556	0.00321	10	0.32100	0.32100
GLEC Number: 8989 60%	3	10	0.81240	0.81042	0.00198	10	0.19800	0.19800
	4	10	0.80849	0.80580	0.00269	10	0.26900	0.26900
	5	10	0.80107	0.79810	0.00297	9	0.33000	0.29700
	6	10	0.80894	0.80568	0.00326	9	0.36222	0.32600
	7	10	0.80925	0.80590	0.00335	10	0.33500	0.33500
	8	10	0.81921	0.81601	0.00320	10	0.32000	0.32000
						AVERAGE:	0.30378	0.29513

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 5.5 80%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1450
Date/Time out: 8/10/2011 1450

Dessicator
Date/Time in: 8/10/2011 1450
Date/Time out: 8/10/2011 1800

QC'd by: MW

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 5.5	1	10	0.81366	0.81050	0.00316	9	0.35111	0.31600
	2	10	0.81264	0.80960	0.00304	10	0.30400	0.30400
GLEC Number: 8989 80%	3	10	0.80974	0.80682	0.00292	10	0.29200	0.29200
	4	10	0.80697	0.80382	0.00315	10	0.31500	0.31500
	5	10	0.80465	0.80206	0.00259	10	0.25900	0.25900
	6	10	0.81230	0.80966	0.00264	9	0.29333	0.26400
	7	10	0.82003	0.81785	0.00218	8	0.27250	0.21800
	8	10	0.80948	0.80613	0.00335	7	0.47857	0.33500
						AVERAGE:	0.32069	0.28786

GLEC
Great Lakes Environmental Center

TVA Emory River 5069-03

***Hyalella azteca* WEIGHT DATA**

Sample ID: ERM 5.5 100%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Project Name: TVA Emory River

Weigh Date: 8/10/2011

Technician's Initials: KN

Test Date: 7/12/2011-8/9/2011

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 8/9/2011 1450
Date/Time out: 8/10/2011 1450

Dessicator
Date/Time in: 8/10/2011 1450
Date/Time out: 8/10/2011 1811

QC'd by: [illegible]

Sample ID	Replicate Number	A Number of Organisms at Test Initiation	B Dry Weight of Pan and Organisms (g)	C Dry Weight of Pan (g)	B-C Total Dry Weight of Organisms (g)	D Number of Organisms Weighed	B-C/D Average Weight (mg)	B-C/A Biomass Weight (mg)
Sample ID: ERM 5.5	1	10	0.81346	0.81040	0.00306	10	0.30600	0.30600
	2	10	0.80506	0.80226	0.00280	8	0.35000	0.28000
GLEC Number: 8989 100%	3	10	0.80476	0.80221	0.00255	8	0.31875	0.25500
	4	10	0.80119	0.79870	0.00249	10	0.24900	0.24900
	5	10	0.81346	0.81130	0.00216	10	0.21600	0.21600
	6	10	0.81100	0.80767	0.00333	10	0.33300	0.33300
	7	10	0.80254	0.80055	0.00199	10	0.19900	0.19900
	8	10	0.81190	0.80898	0.00292	10	0.29200	0.29200
						AVERAGE:	0.28297	0.26625

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	7/12/2011	Test ID:	ermcon28ha	Sample ID:	-LCS
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-%	1	2	3	4	5	6	7	8
GLW	1.0000	1.0000	1.0000	0.7000	1.0000	0.8000	1.0000	1.0000
LCS + GLW	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LCS + ERW	0.9000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.9375	0.9615	1.3213	0.9912	1.4120	12.927	8			
LCS + GLW	0.9750	1.0000	1.3739	1.1071	1.4120	7.845	8	*		
LCS + ERW	0.9750	1.0000	1.3713	1.2490	1.4120	5.501	8	0.057	1.761	0.0819

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.52133	0.887	-2.2922	4.75294
F-Test indicates equal variances (p = 0.37)	2.04137	4.99491		
The control means are not significantly different (p = 0.47)	0.73671	2.14479		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.03748	0.03897	2.8E-05	0.00865	0.95564	1, 14

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	7/12/2011	Test ID:	ermcon28ha	Sample ID:	-LCS
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-%	1	2	3	4	5	6	7	8
GLW	0.3290	0.3500	0.2820	0.3529	0.2650	0.4275	0.2330	0.3030
LCS + GLW	0.6050	0.7310	0.6780	0.6270	0.3720	0.5440	0.4590	0.4930
LCS + ERW	0.5556	0.4500	0.3630	0.5290	0.4256	0.4820	0.4950	0.6070

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.3178	0.5638	0.3178	0.2330	0.4275	19.142	8			
LCS + GLW	0.5636	1.0000	0.5636	0.3720	0.7310	21.192	8	*		
LCS + ERW	0.4884	0.8665	0.4884	0.3630	0.6070	15.758	8	1.498	1.761	0.0885

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98881	0.887	-0.189	-0.3929
F-Test indicates equal variances (p = 0.27)	2.4088	4.99491		
The control means are significantly different (p = 1.38E-04)	5.18732	2.14479		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.08848	0.15698	0.02264	0.01009	0.15642	1, 14

ToxCalc v5.0.32

Reviewed by: AB

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	7/12/2011	Test ID:	ermcon28ha	Sample ID:	-LCS
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: LCS=Lab Control Sediment; ERW=Emory River Water; GLW=GLEC Lab Water

Conc-%	1	2	3	4	5	6	7	8
GLW	0.3290	0.3500	0.2820	0.2470	0.2650	0.3420	0.2330	0.3030
LCS + GLW	0.4840	0.7310	0.6780	0.6270	0.3720	0.5440	0.4590	0.4930
LCS + ERW	0.5000	0.4500	0.3630	0.5290	0.3830	0.4820	0.4950	0.6070

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.2939	0.5358	0.2939	0.2330	0.3500	15.032	8			
LCS + GLW	0.5485	1.0000	0.5485	0.3720	0.7310	22.079	8	*		
LCS + ERW	0.4761	0.8680	0.4761	0.3630	0.6070	16.468	8	1.419	1.761	0.0898

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98233	0.887	0.17638	-0.5079
F-Test indicates equal variances (p = 0.27)	2.38544	4.99491		
The control means are significantly different (p = 6.70E-05)	5.58679	2.14479		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs LCS + GLW	0.08984	0.16379	0.02095	0.01041	0.1778	1, 14

ToxCalc v5.0.32

Reviewed by: AB

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	7/12/2011	Test ID:	erm1.0ha	Sample ID:	ERM 1.0
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.9000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
ERS + ERW	1.0000	0.9000	0.9000	1.0000	0.8000	1.0000	1.0000	1.0000
10	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	1.0000
20	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000	0.8000
40	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
60	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	1.0000
80	1.0000	0.8000	1.0000	1.0000	1.0000	0.7000	0.8000	1.0000
100	1.0000	1.0000	0.8000	0.8000	0.8000	0.8000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8				
ERS + ERW	0.9500	1.0000	1.3332	1.1071	1.4120	8.799	8	*		0.9675	1.0000
10	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8	73.00	46.00	0.9675	1.0000
20	0.9500	1.0000	1.3358	1.1071	1.4120	10.565	8	70.00	46.00	0.9675	1.0000
40	0.9875	1.0395	1.3916	1.2490	1.4120	4.140	8	76.50	46.00	0.9675	1.0000
60	0.9750	1.0263	1.3739	1.1071	1.4120	7.845	8	75.00	46.00	0.9675	1.0000
80	0.9125	0.9605	1.2832	0.9912	1.4120	14.134	8	64.50	46.00	0.9125	0.9432
100	0.9000	0.9474	1.2596	1.1071	1.4120	12.938	8	60.00	46.00	0.9000	0.9302

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	2.13577	1.035	-0.8805	-0.3247
Bartlett's Test indicates equal variances (p = 0.07)	11.5489	12.5916		
The control means are not significantly different (p = 0.45)	0.77284	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	77.591			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	7/12/2011	Test ID:	erm1.0ha	Sample ID:	ERM 1.0
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5556	0.4500	0.3630	0.5290	0.4256	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.4356	0.3989	0.3500	0.5425	0.3930	0.4370	0.2610
10	0.4150	0.4110	0.3900	0.3370	0.3270	0.4150	0.4522	0.3880
20	0.3700	0.3680	0.4375	0.4130	0.2530	0.3590	0.3650	0.3912
40	0.3050	0.3300	0.2770	0.5367	0.5800	0.3190	0.4310	0.3170
60	0.3010	0.2600	0.3030	0.3610	0.3550	0.4012	0.3900	0.3830
80	0.2950	0.4425	0.1900	0.2680	0.2760	0.2957	0.3500	0.3310
100	0.2240	0.2710	0.2675	0.3250	0.2725	0.3662	0.3070	0.2830

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.4884	1.2233	0.4884	0.3630	0.6070	15.758	8					
ERS + ERW	0.3992	1.0000	0.3992	0.2610	0.5425	20.168	8	*			0.3992	1.0000
10	0.3919	0.9816	0.3919	0.3270	0.4522	10.703	8	0.210	2.359	0.0825	0.3919	0.9816
20	0.3696	0.9257	0.3696	0.2530	0.4375	14.711	8	0.848	2.359	0.0825	0.3783	0.9475
40	0.3870	0.9692	0.3870	0.2770	0.5800	29.816	8	0.351	2.359	0.0825	0.3783	0.9475
60	0.3443	0.8623	0.3443	0.2600	0.4012	14.692	8	1.572	2.359	0.0825	0.3443	0.8623
*80	0.3060	0.7665	0.3060	0.1900	0.4425	23.828	8	2.666	2.359	0.0825	0.3060	0.7665
*100	0.2895	0.7252	0.2895	0.2240	0.3662	14.830	8	3.138	2.359	0.0825	0.2895	0.7252

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.76933	1.035	0.49834	0.9462
Bartlett's Test indicates equal variances (p = 0.07)	11.8267	12.5916		
The control means are significantly different (p = 0.04)	2.26379	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	60	80	69.282	1.66667	0.08248	0.20659	0.01514	0.00489	0.01193	6, 49
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	19.263	18.348	4.207	60.801	0.3107
IC10	51.153	18.727	8.415	68.862	-0.3597
IC15	62.575				
IC20	73.011				
IC25	87.995				
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	7/12/2011	Test ID:	erm1.0ha	Sample ID:	ERM 1.0
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5000	0.4500	0.3630	0.5290	0.3830	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.3920	0.3590	0.3500	0.4340	0.3930	0.4370	0.2610
10	0.4150	0.4110	0.3510	0.3370	0.3270	0.4150	0.4070	0.3880
20	0.3700	0.3680	0.3500	0.4130	0.2530	0.3590	0.3650	0.3130
40	0.3050	0.3300	0.2770	0.4830	0.5800	0.3190	0.4310	0.3170
60	0.3010	0.2600	0.3030	0.3610	0.3550	0.3210	0.3900	0.3830
80	0.2950	0.3540	0.1900	0.2680	0.2760	0.2070	0.2800	0.3310
100	0.2240	0.2710	0.2140	0.2600	0.2180	0.2930	0.3070	0.2830

			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.4761	1.2688	0.4761	0.3630	0.6070	16.468	8				
ERS + ERW	0.3753	1.0000	0.3753	0.2610	0.4370	14.877	8	*		0.3783	1.0000
10	0.3814	1.0163	0.3814	0.3270	0.4150	9.755	8	68.00	46.00	0.3783	1.0000
20	0.3489	0.9297	0.3489	0.2530	0.4130	13.604	8	55.00	46.00	0.3646	0.9637
40	0.3803	1.0133	0.3803	0.2770	0.5800	28.050	8	63.00	46.00	0.3646	0.9637
60	0.3342	0.8907	0.3342	0.2600	0.3900	13.570	8	52.00	46.00	0.3342	0.8835
*80	0.2751	0.7332	0.2751	0.1900	0.3540	20.238	8	43.00	46.00	0.2751	0.7272
*100	0.2587	0.6895	0.2587	0.2140	0.3070	13.943	8	40.00	46.00	0.2587	0.6840

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.71798	1.035	0.50989	1.79272
Bartlett's Test indicates unequal variances (p = 0.04)	13.0969	12.5916		
The control means are significantly different (p = 0.01)	2.96425	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	60	80	69.282	1.66667
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	43.408	16.860	6.946	58.664	-0.0457
IC10	55.889	14.585	16.426	64.907	-1.1568
IC15	64.291	9.112	35.280	71.779	-2.7092
IC20	70.689	5.646	60.061	82.485	0.0801
IC25	77.088				
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	7/12/2011	Test ID:	erm2.5ha	Sample ID:	ERM 2.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.9000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
ERS + ERW	1.0000	0.9000	0.9000	1.0000	0.8000	1.0000	1.0000	1.0000
10	1.0000	0.9000	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000
60	0.8000	0.8000	0.8000	1.0000	1.0000	1.0000	0.9000	0.8000
80	1.0000	1.0000	0.6000	0.6000	0.8000	0.9000	0.8000	0.9000
100	0.6000	0.6000	0.3000	0.3000	0.7000	0.2000	0.1000	0.6000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8				
ERS + ERW	0.9500	1.0000	1.3332	1.1071	1.4120	8.799	8	*		0.9688	1.0000
10	0.9500	1.0000	1.3305	1.2490	1.4120	6.547	8	66.00	46.00	0.9688	1.0000
20	1.0000	1.0526	1.4120	1.4120	1.4120	0.000	8	80.00	46.00	0.9688	1.0000
40	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8	73.00	46.00	0.9688	1.0000
60	0.8875	0.9342	1.2392	1.1071	1.4120	12.179	8	56.50	46.00	0.8875	0.9161
80	0.8250	0.8684	1.1636	0.8861	1.4120	17.745	8	52.00	46.00	0.8250	0.8516
*100	0.4250	0.4474	0.6993	0.3218	0.9912	34.886	8	36.00	46.00	0.4250	0.4387

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.94836	1.035	-0.3106	0.18667
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.45)	0.77284	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	80	100	89.4427	1.25
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	51.923	5.789	44.826	64.565	1.0295
IC10	65.000	8.798	52.994	81.411	0.4079
IC15	80.078	6.022	61.636	83.665	-1.1391
IC20	82.500	2.919	73.550	86.141	-1.2487
IC25	84.922	2.062	80.475	88.347	-0.2110
IC40	92.188				
IC50	97.031				

ToxCalc v5.0.32

Reviewed by: AB

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	7/12/2011	Test ID:	erm2.5ha	Sample ID:	ERM 2.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5556	0.4500	0.3630	0.5290	0.4256	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.4356	0.3989	0.3500	0.5425	0.3930	0.4370	0.2610
10	0.3540	0.2944	0.2756	0.2980	0.3667	0.3333	0.3270	0.3090
20	0.2950	0.3620	0.3090	0.2910	0.2840	0.2520	0.2910	0.2860
40	0.2810	0.2860	0.2380	0.3989	0.4467	0.2190	0.2920	0.2430
60	0.2550	0.2275	0.2212	0.3010	0.2500	0.2790	0.2467	0.2450
80	0.1880	0.2500	0.2683	0.3400	0.2762	0.2200	0.2225	0.2611
100	0.1633	0.1450	0.1567	0.1400	0.1314	0.2400	1.3200	0.1883

			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.4884	1.2233	0.4884	0.3630	0.6070	15.758	8				
ERS + ERW	0.3992	1.0000	0.3992	0.2610	0.5425	20.168	8	*		0.3992	1.0000
*10	0.3198	0.8009	0.3198	0.2756	0.3667	9.743	8	46.00	46.00	0.3198	0.8009
*20	0.2962	0.7420	0.2962	0.2520	0.3620	10.486	8	44.00	46.00	0.2984	0.7474
40	0.3006	0.7528	0.3006	0.2190	0.4467	26.842	8	50.00	46.00	0.2984	0.7474
*60	0.2532	0.6341	0.2532	0.2212	0.3010	10.295	8	38.00	46.00	0.2723	0.6822
*80	0.2533	0.6344	0.2533	0.1880	0.3400	18.071	8	40.00	46.00	0.2723	0.6822
100	0.3106	0.7780	0.3106	0.1314	1.3200	131.788	8			0.2723	0.6822

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93935	0.929	0.65206	2.13323
Bartlett's Test indicates unequal variances (p = 5.97E-03)	16.3255	11.0705		
The control means are significantly different (p = 0.04)	2.26379	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	<10	10		
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	2.511	2.252	1.679	11.413	3.9420
IC10*	5.022				
IC15*	7.534				
IC20	10.167				
IC25	19.521				
IC40	>100				
IC50	>100				

* indicates IC estimate less than the lowest concentration

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	7/12/2011	Test ID:	erm2.5ha	Sample ID:	ERM 2.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/23/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5000	0.4500	0.3630	0.5290	0.3830	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.3920	0.3590	0.3500	0.4340	0.3930	0.4370	0.2610
10	0.3540	0.2650	0.2480	0.2980	0.3300	0.3000	0.3270	0.3090
20	0.2950	0.3620	0.3090	0.2910	0.2840	0.2520	0.2910	0.2860
40	0.2810	0.2860	0.2380	0.3590	0.4020	0.2190	0.2920	0.2430
60	0.2040	0.1820	0.1770	0.3010	0.2500	0.2790	0.2220	0.1960
80	0.1880	0.2500	0.1610	0.2040	0.2210	0.1980	0.1780	0.2350
100	0.0980	0.0870	0.0470	0.0420	0.0920	0.0480	0.1320	0.1130

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.4761	1.2688	0.4761	0.3630	0.6070	16.468	8					
ERS + ERW	0.3753	1.0000	0.3753	0.2610	0.4370	14.877	8	*			0.3753	1.0000
*10	0.3039	0.8098	0.3039	0.2480	0.3540	11.426	8	3.168	2.306	0.0520	0.3039	0.8098
*20	0.2962	0.7895	0.2962	0.2520	0.3620	10.486	8	3.506	2.306	0.0520	0.2962	0.7895
*40	0.2900	0.7728	0.2900	0.2190	0.4020	21.558	8	3.783	2.306	0.0520	0.2900	0.7728
*60	0.2264	0.6033	0.2264	0.1770	0.3010	20.275	8	6.607	2.306	0.0520	0.2264	0.6033
*80	0.2044	0.5446	0.2044	0.1610	0.2500	14.541	8	7.583	2.306	0.0520	0.2044	0.5446
100	0.0824	0.2195	0.0824	0.0420	0.1320	40.580	8				0.0824	0.2195

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98344	0.929	0.15436	0.5867
Bartlett's Test indicates equal variances (p = 0.26)	6.49118	11.0705		
The control means are significantly different (p = 0.01)	2.96425	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<10	10			0.05195	0.13845	0.02969	0.00203	2.7E-08	5, 42
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	2.629	0.849	1.875	4.960	1.9957
IC10*	5.257	2.433	3.749	9.923	6.0893
IC15*	7.886	8.499	5.624	40.903	2.7590
IC20	14.820	14.562	7.498	45.248	0.4977
IC25	42.692	12.491	9.373	51.677	-0.7487
IC40	61.114	9.128	49.526	80.588	0.3770
IC50	82.746	3.973	72.207	86.111	-3.4660

* indicates IC estimate less than the lowest concentration

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	7/12/2011	Test ID:	erm3.5ha	Sample ID:	ERM 3.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.9000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
ERS + ERW	1.0000	0.9000	0.9000	1.0000	0.8000	1.0000	1.0000	1.0000
10	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	0.7000	1.0000
20	0.8000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
40	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	0.8000	0.6000
60	0.9000	0.9000	0.8000	0.8000	0.9000	0.9000	0.9000	1.0000
80	0.9000	1.0000	1.0000	0.8000	0.8000	0.9000	1.0000	1.0000
100	0.5000	0.6000	0.6000	0.5000	0.6000	0.7000	0.7000	0.5000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8				
ERS + ERW	0.9500	1.0000	1.3332	1.1071	1.4120	8.799	8	*		0.9542	1.0000
10	0.9500	1.0000	1.3390	0.9912	1.4120	11.328	8	71.00	46.00	0.9542	1.0000
20	0.9625	1.0132	1.3535	1.1071	1.4120	8.476	8	71.50	46.00	0.9542	1.0000
40	0.9000	0.9474	1.2674	0.8861	1.4120	15.071	8	62.50	46.00	0.9042	0.9476
60	0.8875	0.9342	1.2339	1.1071	1.4120	7.810	8	52.50	46.00	0.9042	0.9476
80	0.9250	0.9737	1.2951	1.1071	1.4120	10.505	8	63.00	46.00	0.9042	0.9476
*100	0.5875	0.6184	0.8746	0.7854	0.9912	9.801	8	36.00	46.00	0.5875	0.6157

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.37227	1.035	-1.1522	1.11108
Bartlett's Test indicates equal variances (p = 0.42)	6.03067	12.5916		
The control means are not significantly different (p = 0.45)	0.77284	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	80	100	89.4427	1.25
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	39.083	23.048	8.778	81.648	0.3452
IC10	82.868	10.908	37.645	84.606	-3.4130
IC15	85.882	1.371	82.612	87.705	-0.0384
IC20	88.895	1.344	85.856	90.820	0.1858
IC25	91.908	1.418	88.749	94.549	0.4014
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	7/12/2011	Test ID:	erm3.5ha	Sample ID:	ERM 3.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERW=Emory River Water;ERS=Emory Ref Sed

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5556	0.4500	0.3630	0.5290	0.4256	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.4356	0.3989	0.3500	0.5425	0.3930	0.4370	0.2610
10	0.5722	0.4160	0.4410	0.3990	0.3200	0.3160	0.4186	0.3480
20	0.3313	0.2990	0.2520	0.2780	0.3430	0.3544	0.4110	0.3580
40	0.2690	0.3700	0.3520	0.2520	0.3600	0.2956	0.3612	0.1917
60	0.2689	0.2178	0.3200	0.2537	0.2211	0.2033	0.2522	0.0980
80	0.2356	0.2030	0.2490	0.2800	0.2350	0.2144	0.2180	0.2240
100	0.3200	0.2600	0.2583	0.1740	0.1800	0.2700	0.2786	0.3260

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.4884	1.2233	0.4884	0.3630	0.6070	15.758	8					
ERS + ERW	0.3992	1.0000	0.3992	0.2610	0.5425	20.168	8	*			0.4015	1.0000
10	0.4038	1.0115	0.4038	0.3160	0.5722	20.501	8	-0.143	2.306	0.0742	0.4015	1.0000
20	0.3283	0.8224	0.3283	0.2520	0.4110	15.375	8	2.204	2.306	0.0742	0.3283	0.8177
*40	0.3064	0.7675	0.3064	0.1917	0.3700	21.237	8	2.885	2.306	0.0742	0.3064	0.7631
*60	0.2294	0.5746	0.2294	0.0980	0.3200	28.075	8	5.279	2.306	0.0742	0.2400	0.5978
*80	0.2324	0.5820	0.2324	0.2030	0.2800	10.316	8	5.186	2.306	0.0742	0.2400	0.5978
100	0.2584	0.6471	0.2584	0.1740	0.3260	21.786	8				0.2400	0.5978

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97342	0.929	0.12182	1.04887
Bartlett's Test indicates equal variances (p = 0.08)	9.83769	11.0705		
The control means are significantly different (p = 0.04)	2.26379	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	20	40	28.2843	5	0.07418	0.18581	0.04701	0.00414	5.7E-07	5, 42
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	12.742	4.045	3.029	16.653	-0.3882
IC10	15.485	5.258	6.058	27.675	1.9247
IC15	18.227	7.772	9.086	42.732	1.8901
IC20	26.483	10.812	14.026	46.963	0.6248
IC25	41.589	11.092	17.285	52.091	-0.2408
IC40	59.733				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	7/12/2011	Test ID:	erm3.5ha	Sample ID:	ERM 3.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5000	0.4500	0.3630	0.5290	0.3830	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.3920	0.3590	0.3500	0.4340	0.3930	0.4370	0.2610
10	0.5150	0.4160	0.4410	0.3990	0.3200	0.3160	0.2930	0.3480
20	0.2650	0.2990	0.2520	0.2780	0.3430	0.3190	0.4110	0.3580
40	0.2690	0.3700	0.3520	0.2520	0.3240	0.2660	0.2890	0.1150
60	0.2420	0.1960	0.2560	0.2030	0.1990	0.1830	0.2270	0.0980
80	0.2120	0.2030	0.2490	0.2240	0.1880	0.1930	0.2180	0.2240
100	0.1600	0.1560	0.1550	0.0870	0.1080	0.1890	0.1950	0.1630

			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.4761	1.2688	0.4761	0.3630	0.6070	16.468	8				
ERS + ERW	0.3753	1.0000	0.3753	0.2610	0.4370	14.877	8	*		0.3781	1.0000
10	0.3810	1.0153	0.3810	0.2930	0.5150	19.812	8	68.00	46.00	0.3781	1.0000
20	0.3156	0.8411	0.3156	0.2520	0.4110	16.917	8	49.00	46.00	0.3156	0.8347
*40	0.2796	0.7452	0.2796	0.1150	0.3700	28.232	8	45.00	46.00	0.2796	0.7395
*60	0.2005	0.5343	0.2005	0.0980	0.2560	24.101	8	36.00	46.00	0.2072	0.5479
*80	0.2139	0.5700	0.2139	0.1880	0.2490	9.154	8	36.00	46.00	0.2072	0.5479
100	0.1516	0.4041	0.1516	0.0870	0.1950	24.409	8			0.1516	0.4010

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98175	0.929	-0.4145	1.15188
Bartlett's Test indicates unequal variances (p = 0.04)	11.6887	11.0705		
The control means are significantly different (p = 0.01)	2.96425	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	20	40	28.2843	5
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	13.025	4.112	3.160	19.594	0.7059
IC10	16.050	5.013	6.319	26.980	1.6720
IC15	19.075	6.673	9.479	40.282	1.4811
IC20	27.292	8.786	15.622	44.050	0.5293
IC25	37.795	8.408	19.198	47.969	-0.4141
IC40	54.564	7.648	38.596	80.560	1.5348
IC50	86.524	8.072	58.802	92.701	-2.2732

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	7/12/2011	Test ID:	erm5.5ha	Sample ID:	ERM 5.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.9000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
ERS + ERW	1.0000	0.9000	0.9000	1.0000	0.8000	1.0000	1.0000	1.0000
10	0.9000	0.8000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
20	0.9000	0.9000	0.8000	0.7000	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	1.0000	0.9000	1.0000	0.9000	1.0000	1.0000
60	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000
80	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	0.8000	0.7000
100	1.0000	0.8000	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + ERW	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8				
ERS + ERW	0.9500	1.0000	1.3332	1.1071	1.4120	8.799	8	*		0.9525	1.0000
10	0.9500	1.0000	1.3332	1.1071	1.4120	8.799	8	68.00	46.00	0.9525	1.0000
20	0.9125	0.9605	1.2806	0.9912	1.4120	12.693	8	62.50	46.00	0.9525	1.0000
40	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8	73.00	46.00	0.9525	1.0000
60	0.9750	1.0263	1.3713	1.2490	1.4120	5.501	8	73.00	46.00	0.9525	1.0000
80	0.9125	0.9605	1.2806	0.9912	1.4120	12.693	8	62.50	46.00	0.9313	0.9777
100	0.9500	1.0000	1.3358	1.1071	1.4120	10.565	8	70.00	46.00	0.9313	0.9777

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	2.0985	1.035	-0.9925	-0.0952
Bartlett's Test indicates equal variances (p = 0.28)	7.47215	12.5916		
The control means are not significantly different (p = 0.45)	0.77284	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs ERS + ERW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	7/12/2011	Test ID:	erm5.5ha	Sample ID:	ERM 5.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5556	0.4500	0.3630	0.5290	0.4256	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.4356	0.3989	0.3500	0.5425	0.3930	0.4370	0.2610
10	0.3400	0.5100	0.4000	0.3300	0.3020	0.3150	0.4490	0.4860
20	0.4256	0.3844	0.5000	0.3629	0.4300	0.3170	0.3330	0.3260
40	0.2320	0.3400	0.2610	0.3522	0.3270	0.3367	0.3410	0.3170
60	0.2950	0.3210	0.1980	0.2690	0.3300	0.3622	0.3350	0.3200
80	0.3511	0.3040	0.2920	0.3150	0.2590	0.2933	0.2725	0.4786
100	0.3060	0.3500	0.3188	0.2490	0.2160	0.3330	0.1990	0.2920

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.4884	1.2233	0.4884	0.3630	0.6070	15.758	8					
ERS + ERW	0.3992	1.0000	0.3992	0.2610	0.5425	20.168	8	*			0.3992	1.0000
10	0.3915	0.9806	0.3915	0.3020	0.5100	20.851	8	0.238	2.359	0.0766	0.3915	0.9806
20	0.3849	0.9640	0.3849	0.3170	0.5000	16.490	8	0.443	2.359	0.0766	0.3849	0.9640
*40	0.3134	0.7849	0.3134	0.2320	0.3522	13.799	8	2.644	2.359	0.0766	0.3134	0.7849
*60	0.3038	0.7609	0.3038	0.1980	0.3622	16.745	8	2.939	2.359	0.0766	0.3122	0.7821
*80	0.3207	0.8032	0.3207	0.2590	0.4786	21.688	8	2.418	2.359	0.0766	0.3122	0.7821
*100	0.2830	0.7088	0.2830	0.1990	0.3500	19.621	8	3.579	2.359	0.0766	0.2830	0.7088

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.56824	1.035	0.32995	0.21949
Bartlett's Test indicates equal variances (p = 0.64)	4.27507	12.5916		
The control means are significantly different (p = 0.04)	2.26379	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	20	40	28.2843	5	0.07664	0.19196	0.01838	0.00422	0.00135	6, 49
Treatments vs ERS + ERW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	21.560	8.080	3.460	27.704	-0.1753
IC10	27.144	10.218	6.921	37.163	1.6444
IC15	32.728	14.371	14.770	82.039	2.4091
IC20	38.312				
IC25	88.749				
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	7/12/2011	Test ID:	erm5.5ha	Sample ID:	ERM 5.5
End Date:	8/9/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	5/24/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: ERM=Emory River Mile; LCS=Lab Control Sediment; ERS=Emory Reference Sed; ERW=Emory River Water

Conc-%	1	2	3	4	5	6	7	8
LCS + ERW	0.5000	0.4500	0.3630	0.5290	0.3830	0.4820	0.4950	0.6070
ERS + ERW	0.3760	0.3920	0.3590	0.3500	0.4340	0.3930	0.4370	0.2610
10	0.3060	0.4080	0.4000	0.2970	0.3020	0.3150	0.4490	0.4860
20	0.3830	0.3460	0.4000	0.2540	0.4300	0.3170	0.3330	0.3260
40	0.2320	0.3400	0.2610	0.3170	0.3270	0.3030	0.3410	0.3170
60	0.2950	0.3210	0.1980	0.2690	0.2970	0.3260	0.3350	0.3200
80	0.3160	0.3040	0.2920	0.3150	0.2590	0.2640	0.2180	0.3350
100	0.3060	0.2800	0.2550	0.2490	0.2160	0.3330	0.1990	0.2920

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + ERW	0.4761	1.2688	0.4761	0.3630	0.6070	16.468	8					
ERS + ERW	0.3753	1.0000	0.3753	0.2610	0.4370	14.877	8	*			0.3753	1.0000
10	0.3704	0.9870	0.3704	0.2970	0.4860	20.182	8	0.188	2.359	0.0610	0.3704	0.9870
20	0.3486	0.9290	0.3486	0.2540	0.4300	15.771	8	1.029	2.359	0.0610	0.3486	0.9290
*40	0.3047	0.8121	0.3047	0.2320	0.3410	12.746	8	2.724	2.359	0.0610	0.3047	0.8121
*60	0.2951	0.7865	0.2951	0.1980	0.3350	15.127	8	3.096	2.359	0.0610	0.2951	0.7865
*80	0.2879	0.7672	0.2879	0.2180	0.3350	13.332	8	3.376	2.359	0.0610	0.2879	0.7672
*100	0.2663	0.7095	0.2663	0.1990	0.3330	17.011	8	4.212	2.359	0.0610	0.2663	0.7095

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.75106	1.035	-0.2812	-0.1876
Bartlett's Test indicates equal variances (p = 0.57)	4.83269	12.5916		
The control means are significantly different (p = 0.01)	2.96425	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	20	40	28.2843	5	0.06105	0.16269	0.0149	0.00268	1.9E-04	6, 49
Treatments vs ERS + ERW										

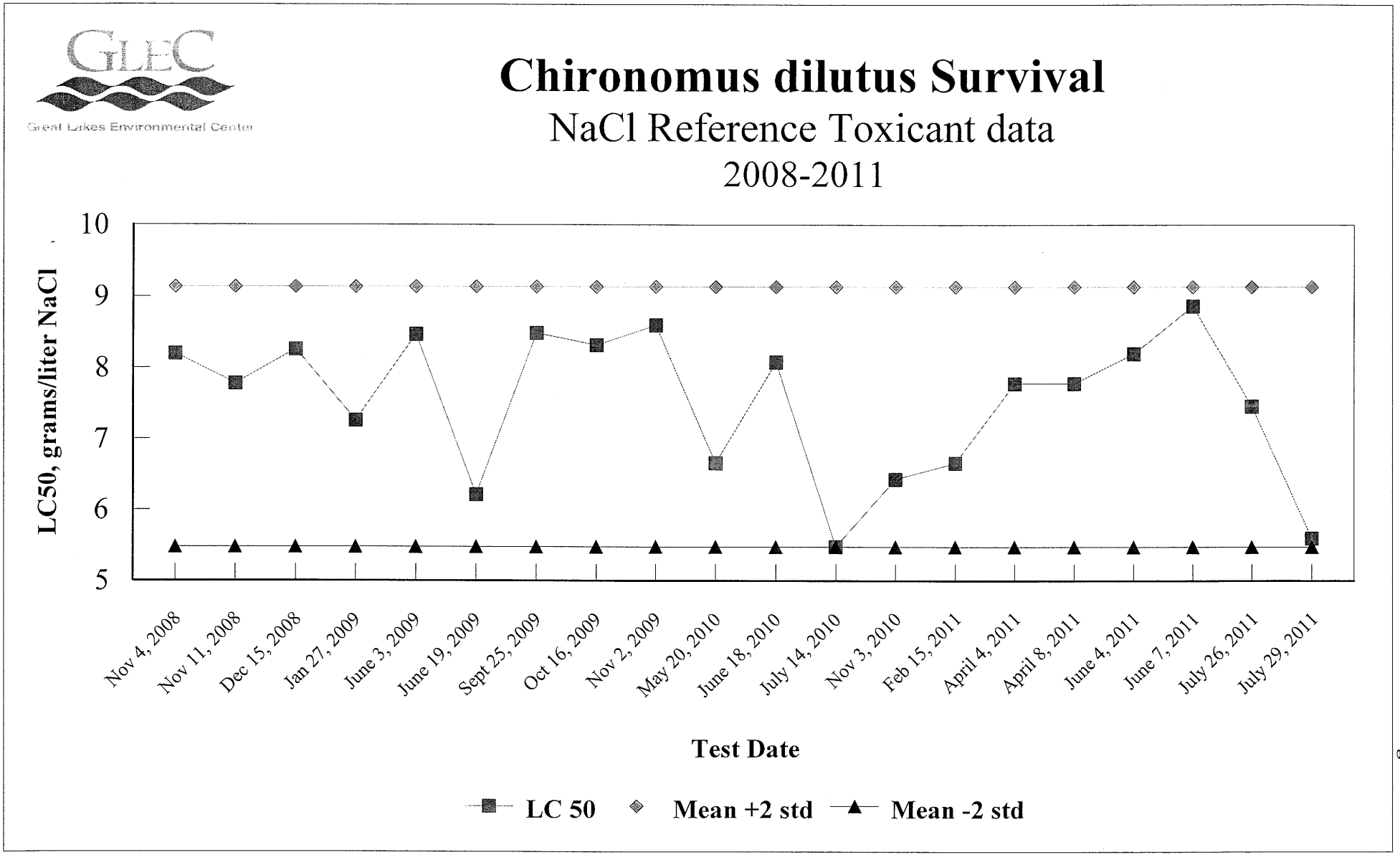
Linear Interpolation (200 Resamples)

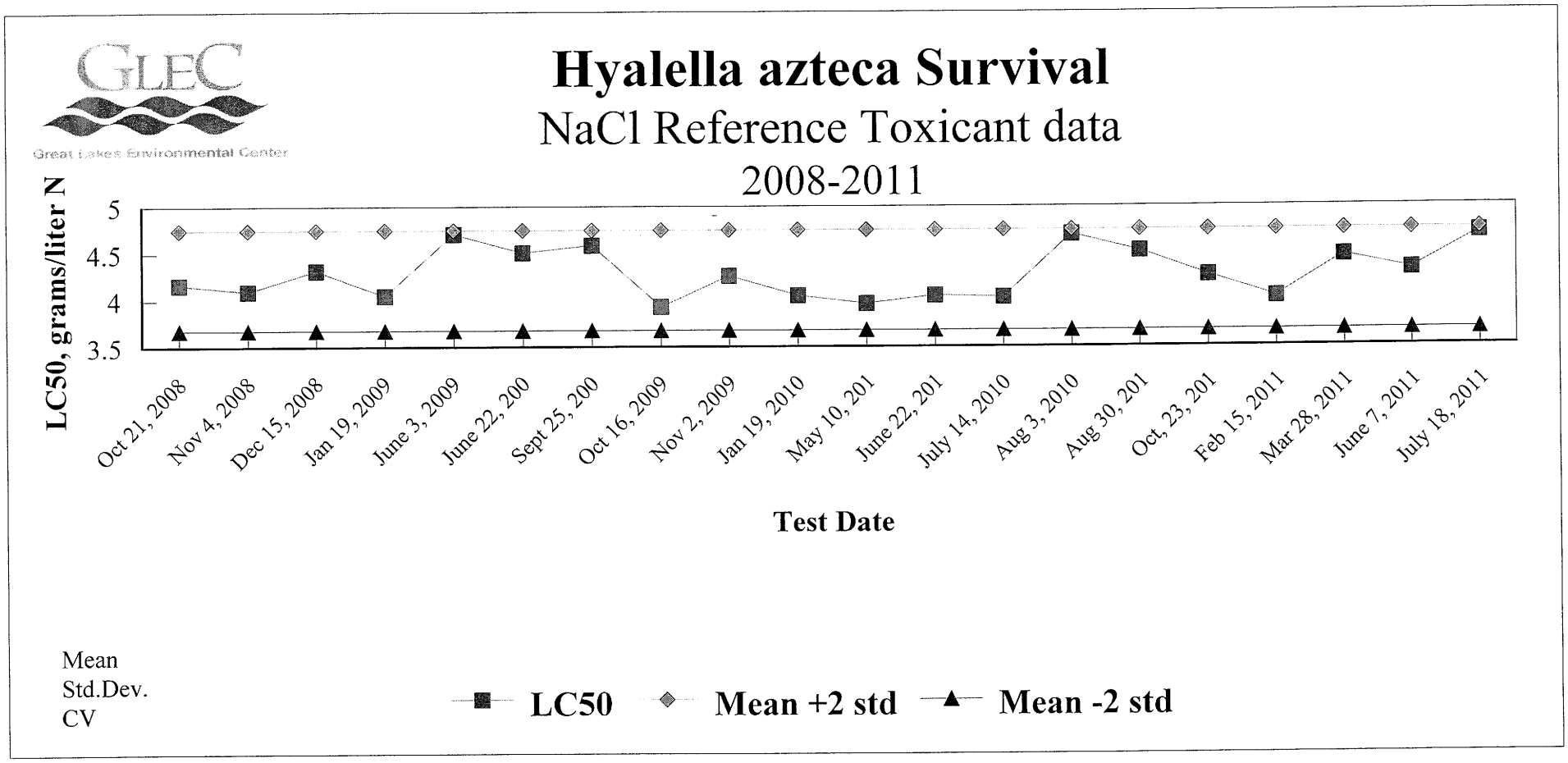
Point	%	SD	95% CL		Skew
IC05	16.385	6.822	3.714	27.915	0.6134
IC10	24.969	8.150	7.428	38.404	0.6594
IC15	33.521	11.224	14.989	63.723	1.0586
IC20	49.455				
IC25	85.954				
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AB

Appendix G
Reference Toxicant Data


GLEC
Great Lakes Environmental Center
Chironomus dilutus Survival
NaCl Reference Toxicant data
2008-2011
LC50, grams/liter NaCl
10
9
8
7
6
5
Nov 4, 2008
Nov 11, 2008
Dec 15, 2008
Jan 27, 2009
June 3, 2009
June 19, 2009
Sept 25, 2009
Oct 16, 2009
Nov 2, 2009
May 20, 2010
June 18, 2010
July 14, 2010
Nov 3, 2010
Feb 15, 2011
April 4, 2011
April 8, 2011
June 4, 2011
June 7, 2011
July 26, 2011
July 29, 2011
Test Date
LC 50
Mean +2 std
Mean -2 std


GLEC
Great Lakes Environmental Center
Hyalella azteca Survival
NaCl Reference Toxicant data
2008-2011
LC50, grams/liter N
5
4.5
4
3.5
Oct 21, 2008
Nov 4, 2008
Dec 15, 2008
Jan 19, 2009
June 3, 2009
June 22, 200
Sept 25, 200
Oct 16, 2009
Nov 2, 2009
Jan 19, 2010
May 10, 201
June 22, 201
July 14, 2010
Aug 3, 2010
Aug 30, 201
Oct, 23, 201
Feb 15, 2011
Mar 28, 2011
June 7, 2011
July 18, 2011
Test Date
Mean
Std.Dev.
CV
LC50
Mean +2 std
Mean -2 std