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:
Clinch River Sediment Samples

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Executive Summary

Great Lakes Environmental Center, Inc. (GLEC), via a contract with the Tennessee Valley Authority (TVA), conducted definitive whole sediment toxicity tests to evaluate survival, growth, and emergence for *Chironomus dilutus* and survival and growth for *Hyalella azteca*. The whole sediment toxicity tests were performed with four investigative sediment samples for each test organism at six sediment test concentrations: 10%, 20%, 40%, 60%, 80%, and 100%, and one reference control sediment sample. The sediment dilutions were prepared by thoroughly mixing the investigative sediments with Clinch River reference sediment. The investigative and reference sediments were collected from predetermined locations in the Clinch River. These sediment samples were selected based on the results of both the sediment physical and chemical analysis, and on 10-day whole sediment toxicity test results. The Clinch 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 *C. dilutus* partial life cycle whole sediment toxicity tests were: CRM 1.5, CRM 2.0, CRM 3.0, and CRM 4.0. The investigative sediment samples CRM 1.5, CRM 2.5, CRM 3.0, and CRM 4.5 were used in the 28-day *H. azteca* whole sediment toxicity tests. All tests were initiated with six sediment concentrations: 10%, 20%, 40%, 60%, 80%, and 100%. Surface water collected from the Clinch River was used as the overlying water in exposures to the four investigative sediments (each with six concentrations), 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, 20-day 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, growth, and biomass. The *C. dilutus* and *H. azteca* definitive whole sediment toxicity tests were performed March 24 through May 14, 2011 and March 22 through April 19, 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 reference sediment sample (Clinch River reference control sediment) collected upstream of the spill site on the Clinch River. All the control samples for the *C. dilutus* whole sediment toxicity tests met the performance criteria for 20-day survival, 20-day growth, and 20-day biomass, as well as the test termination endpoints of partial life cycle percent survival and percent emergence. After 51 days, the four investigative sediment samples showed no statistically significant reduction in the 20-day survival, 20-day growth, or 20-day biomass in the *C. dilutus* whole sediment toxicity tests. However, investigative sediment sample CRM 1.5 showed a statistical effect on the *C. dilutus*, partial life cycle survival (IC_{25} = 89.8%) and percent emergence (IC_{25} = 86.9%) when compared to the Clinch River reference sediment control.

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 not statistically different in any of the four investigative samples when compared to the Clinch River reference control sediment. However, growth and biomass in investigative sediment samples CRM 1.5 ($IC_{25\ GROWTH}$ = 64.9%; $IC_{25\ BIOMASS}$ = 62.0%) and CRM 4.5 ($IC_{25\ GROWTH}$ = 67.3%; $IC_{25\ BIOMASS}$ = 66.4%) both showed a statistical reduction when compared to the Clinch River reference control sediment sample.

A non-linear dose response in exposures to the CRM 2.5 investigative sample (IC_{25} > 100% for growth and biomass) resulted in statistically significant differences for growth and biomass in the 60% and 80% test concentrations only. These results were likely the result of a statistical anomaly.

Introduction

Great Lakes Environmental Center, Inc. (GLEC) under contract with the Tennessee Valley Authority (TVA), conducted and completed the analysis of definitive whole sediment toxicity tests for survival, growth, and emergence for *Chironomus dilutus* and survival and growth for *Hyalella azteca*. The whole sediment toxicity tests were performed with four investigative sediment samples for each test organism at six test concentrations: 10%, 20%, 40%, 60%, 80%, and 100%, and one reference control sediment sample. All investigative sediment samples and the reference control sediment sample were collected from the Clinch River by the Tennessee Valley Authority (TVA) and Restoration Services, Inc. (RSI).

The investigative sediment samples were collected from the Clinch River; the sample locations were selected based on previous 10-day screening whole sediment toxicity test results and sediment physical and chemical analysis. The investigative sediment samples used for the *C. dilutus* partial life cycle (endpoints: survival, growth, and emergence) whole sediment toxicity tests were: CRM 1.5, CRM 2.0, CRM 3.0, and 4.0. The 28-day *H. azteca* survival and growth whole sediment toxicity tests were performed with investigative sediment samples CRM 1.5, CRM 2.5, CRM 3.0, and CRM 4.5. The sediment dilutions were prepared by thoroughly mixing the investigative sediments with Clinch River reference sediment collected upstream of the spill site on the Clinch River. All survival, growth, and emergence results were statistically compared to the Clinch River reference control sediment sample results. Statistical analysis was 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 Clinch River upstream of the spill site was used as the overlying water in the four investigative sediment samples (with six test concentrations each), the reference control sediment, and a laboratory control sediment.

As outlined in the TVA Kingston sediment study design, an additional laboratory control sediment and water only control were also analyzed during the testing period for the whole sediment toxicity tests. The overlying water for the water only and the second 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: CRM 1.5: 20-Day *C. dilutus* Average Percent Survival, Growth, Biomass (expressed as average ash-free-dry-weight (AFDW)); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence

- Tables 6, 7, 8, and 9: CRM 2.0: 20-Day *C. dilutus* Average Percent Survival, Growth, Biomass (AFDW); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence
- Tables 10, 11, 12, and 13: CRM 3.0: 20-Day *C. dilutus* Average Percent Survival, Growth, Biomass (AFDW); Partial Life Cycle Survival, Percent Emergence, and Total Cumulative Percent Emergence
- Tables 14, 15, 16, and 17: CRM 4.0: 20-Day *C. dilutus* Average Percent Survival, Growth, Biomass (AFDW); 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, Biomass (AFDW); 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, Biomass (AFDW); 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: CRM 1.5: 28-Day *H. azteca* Average Percent Survival, Growth, and Biomass
- Tables 28 and 29: CRM 2.5: 28-Day *H. azteca* Average Percent Survival, Growth, and Biomass
- Tables 30 and 31: CRM 3.0: 28-Day *H. azteca* Average Percent Survival, Growth, and Biomass
- Tables 32 and 33: CRM 4.5: 28-Day *H. azteca* Average Percent Survival, Growth, and Biomass
- Tables 34 and 35: Control Data: 28-Day *H. azteca* Average Percent Survival, Growth, and Biomass
- Table 36: Summary of NOEC, LOEC, and IC_{25} Estimates, for 28-Day *H. azteca* Average Percent Survival, Growth, 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 Clinch River Mile 7.0 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. A detailed summary of the overlying water quality measurements is provided in Appendix C. The daily laboratory bench data sheets are maintained in files at GLEC, and are also provided on the enclosed compact diskettes. Chain of Custody forms and reference toxicant data are provided in Appendices A and G, respectively.

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 Clinch 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 Clinch 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 four investigative sediment samples designated for each test organism and one reference sediment were collected by Tennessee Valley Authority (TVA) and Restoration Services, Inc. (RSI) February 7 through February 9, 2011, and shipped to the GLEC laboratory via a refrigerated carrier on February 11, 2011. The samples were received at GLEC on February 12, 2011. Upon arrival at GLEC the samples were assigned unique GLEC laboratory identification numbers and stored in the dark at 4°C (0-6°C) until test initiation. These investigative sediment samples had also been used in conducting 10-day (screening) whole sediment toxicity tests from February 15 through February 25, 2011. The surface water (collected from the Clinch 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. Sample identification and collection information for both sediments and water is provided in the table below.

Sample I.D.	GLEC Lab. ID Number	Date Sampled	Date Received
Clinch Reference Sediment	8897 8914	February 09, 2011	February 12, 2011 March 24, 2011
CRM 1.5	8889	February 07, 2011	February 12, 2011

Sample I.D.	GLEC Lab. ID Number	Date Sampled	Date Received
CRM 2.0	8891	February 07, 2011	February 12, 2011
CRM 2.5	8892	February 07, 2011	February 12, 2011
CRM 3.0	8893	February 08, 2011	February 12, 2011
CRM 4.0	8895	February 08, 2011	February 12, 2011
CRM 4.5	8896	February 08, 2011	February 12, 2011
Clinch River Water –CRM 7.0	8911	March 16, 2011	March 18, 2011
Clinch River Water –CRM 7.0	8913	March 21, 2011	March 23, 2011
Clinch River Water –CRM 7.0	8917	March 23, 2011	March 29, 2011
Clinch River Water –CRM 7.0	8919	March 30, 2011	April 01, 2011
Clinch River Water –CRM 7.0	8922	April 04, 2011	April 05, 2011
Clinch River Water –CRM 7.0	8928	April 06, 2011	April 08, 2011
Clinch River Water –CRM 7.0	8938	April 11, 2011	April 12, 2011
Clinch River Water –CRM 7.0	8943	April 13, 2011	April 15, 2011
Clinch River Water –CRM 7.0	8958	April 25, 2011	April 26, 2011
Clinch River Water –CRM 7.0	8969	May 02, 2011	May 03, 2011

The 28-day *H. azteca* toxicity tests were initiated on March 22, 2011 with each of the selected four investigative sediment samples (CRM 1.5, CRM 2.5, CRM 3.0, and CRM 4.5) at six test concentrations: 10%, 20%, 40%, 60%, 80% and 100%, the Clinch River reference sediment, two laboratory control sediments and one water only exposure. The partial life cycle *C. dilutus* toxicity tests were initiated on March 24, 2011, with each of the selected four investigative sediment samples (CRM 1.5, CRM 2.0, CRM 3.0, and CRM 4.0) at six concentrations (10%, 20%, 40%, 60%, 80% and 100%), the Clinch River reference sediment, two laboratory control sediments and one water only exposure. The surface water collected from the Clinch River (CRM 7.0) was used as the overlying water in each of the six treatments for each of the investigative sediment samples, in the Clinch River reference control sediment sample, and in one laboratory control sediment. 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. While sediment dilutions were prepared by volume, average densities were used as a quality control check for the prepared test sediment concentrations; 10%, 20%, 40%, 60%, 80% and100% (Appendix B). For each sediment

concentration, the investigative sediment and Clinch 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 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 (March 21, 2011 for *H. azteca* and March 23, 2011 for *C. dilutus*).

Test organisms were added the day following the addition of sediment and overlying water. This day represented test day 0, with the following exception. On March 24, 2011, for the *C. dilutus* partial life cycle test all treatments of CRM 4.0 and the test organisms were added on the same day (day 0), due to an initial shortage of Clinch River reference sediment. Three gallons of Clinch River reference sediment (GLC Number: 8914) were shipped overnight, (March 23, 2011) via UPS courier, arriving at the GLEC laboratory the morning of March 24, 2011. All six treatments of CRM 4.0 were mixed the morning of March 24, 2011, added to test chambers, (along with the overlying water) at 10:30 hours. The six treatments were then held until the overlying water was visibly clear, at which time second addition of overlying water was added (12:00 hours). The *C. dilutus* larvae were randomly added to the CRM 4.0 treatments on March 24, 2011, beginning at 19:30 hours.

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 Clinch River reference control, the investigative sediment samples, and one of the laboratory controls was Clinch River site water (CRM 7.0), which had an average hardness of 134 mg/L and an average alkalinity of 112 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 136 mg/L and an average alkalinity of 104 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 Clinch River surface water was measured at the beginning use of each batch and when the Clinch 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 fed 1.5 mL of Tetrafin® goldfish food slurry (4 mg/mL dry solids) once daily. 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 309-540 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 were increased if

the DO fell more than 1 mg/L in one day, or when the DO fell below 2.5 mg/L. If the DO 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 recovered to greater than 3.0 mg/L. Once the DO had increased to above 3.0 mg/L, additional water renewals were suspended, until the DO values dropped 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, biomass, and emergence in the treatments with a single control. All survival, growth, and emergence was 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) or nonparametric (e.g., Steel's Many-One Rank or Wilcoxon with Bonferroni's) statistical model. If the data failed to meet the assumptions of normality or homogeneity, then a nonparametric test was used to analyze the data. In addition, the data were analyzed using linear interpolation, a 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 Clinch River reference control sediment (GLC Number 8897).

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 whole sediment toxicity tests. Hatching larvae were located using a dissecting microscope and were then randomly placed in test chambers using a

glass Pasteur pipette. *C. dilutus* were continuously exposed to the test sediments for a period of 20-51 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 four randomly selected replicates at test day 20. The average ash free dry weight (AFDW) in milligrams (mg) of the surviving organisms for each *C. dilutus* replicate, and the biomass [AFDW (mg) of the surviving organisms divided by the initial number of organisms minus any pupae and midges found on day 20] was also determined at test day 20.

Exposures for the remaining eight replicates continued from day 20 to the end of the tests (51 days) and were monitored daily for emergence. Daily recordings included dates of emergence and sex of 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* (5-6 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 to each of the four investigative sediment samples at six test concentrations, the Clinch 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 animals.

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 sediments 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 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 Clinch River surface water (CRM 7.0) 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, 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 Clinch 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 Clinch River reference control sediment had 91.7 percent survival, and 87.5 percent of the organisms exposed to the laboratory control sediment with Clinch River surface water had survived. The organisms exposed to the laboratory control sediment with laboratory water had 91.7 percent survival, and the water only control had 93.8 percent survival after 20 days of exposure.

The *C. dilutus* exposed to the Clinch River reference control sediment, the laboratory control sediments and to the water only control exceeded the minimum partial life cycle survival ($\geq$ 65 percent) and percent emergence ($\geq$ 50%) criteria for acceptable controls (Table 20). The *C. dilutus* exposed to the Clinch River reference control sediment had 78.1 percent partial life cycle survival and 78.1 percent emergence. The organisms exposed to the laboratory control sediment with Clinch River surface water had 75.0 percent partial life cycle survival and 75.0 percent emergence. The organisms exposed to the laboratory control sediment with laboratory water had 77.1 percent partial life cycle survival and 76.0 percent emergence. The water only control had 82.3 percent partial life cycle survival and 82.3 percent emergence at test termination.

There were no statistically significant differences between *C. dilutus* 20-day survival in the laboratory control sediment with Clinch River surface water and the laboratory control sediment with laboratory water (Table 19). However, when the laboratory control sediment with laboratory water was compared to the laboratory control sediment with Clinch River surface water, there was a statistical difference in growth and biomass. The mean 20-day growth and 20-day biomass for *C. dilutus* exposed to the laboratory control sediment with laboratory water were

1.50730 mg and 1.38813 mg, respectively, while the mean growth and biomass for *C. dilutus* exposed to the laboratory control sediment with Clinch River surface water control was 1.09008 mg and 0.94271 mg, respectively. These data suggest to us that either the Clinch River surface water contained a constituent that inhibited growth, or did not contain a constituent essential to optimize growth in *C. dilutus*.

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 growth and biomass between the laboratory control sediment with laboratory water control and the water only control. The mean 20-day growth and 20-day biomass for *C. dilutus* exposed to the laboratory control sediment with laboratory water was 1.50730 mg and 1.38813 mg, respectively, while the mean growth and biomass for *C. dilutus* exposed to the water only control was 0.78883 mg and 0.73102 mg, respectively. These data suggest to us that the sediment provided an additional food source for the *C. dilutus.*

The test exposure water quality measurements (Table 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 fell below 2.5 mg/L, on April 08, 2011, in the investigative samples CRM 4.0 sediment concentration of 60% and CRM 4.0 sediment concentration of 80% (2.2 mg/L and 2.3 mg/L, respectively). In response to the drop in DO on April 8, 2011 we added a third overlying water renewal to all of the controls and investigative test sediment replicates. On April 09, 2011 the DO was below 2.5 mg/L in the laboratory control sediment with Clinch River water (1.3/2.0 mg/L) and in the following investigative sediment sample concentrations:

- CRM 2.0-10% (2.4 mg/L),
- CRM 2.0-20% (2.3 mg/L),
- CRM 2.0-60% (2.4 mg/L),
- CRM 2.0-80% (2.0 mg/L),
- CRM 3.0-20% (2.3 mg/L),
- CRM 3.0-40% (2.0/2.3 mg/L),
- CRM 3.0-60% (2.1 mg/L),
- CRM 3.0-80% (2.0/2.0 mg/L),
- CRM 3.0-100% (2.1/1.8 mg/L),
- CRM 4.0-10% (2.2 mg/L),
- CRM 4.0-20% (2.3 mg/L),
- CRM 4.0-40% (2.0/2.3 mg/L),
- CRM 4.0-60% (1.1 mg/L),

- CRM 4.0-80% (1.6/2.2 mg/L),
- and CRM 4.0-100% (1.6 mg/L).

In response, we added a fourth overlying water renewal to all of the controls and to all treatments of each of the investigative sediment sample replicates. With the frequency of overlying water renewals increased to four over a 24 hour period, the DO measurements of two controls and one investigative sediment were still low. The DO values for the laboratory control sediment with Clinch River surface water and the laboratory control sediment with laboratory water were both 2.5 mg/L (April 10, 2011). The investigative sediment CRM 3.0 sediment concentration of 100% had a DO reading on April 10, 2011 of 2.6 mg/L. The EPA manual recommends that if increasing the overlying water renewals does not increase the DO 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 treatment and controls was suspended on April 10, 2011. April 11, 2011 feeding was reinitiated to all test treatment and controls, due to DO values >3.0 mg/L. The fourth renewal was discontinued on April 12, 2011 and the third water renewal was discontinued on April 14, 2011 because the DO concentrations increased above 3.0 mg/L in all controls and investigative sediment sample replicates (as requested by Rick Sherrard from TVA).

DO concentrations also fell below 2.5 mg/L on April 18 and 19, 2011 in investigative sediment sample CRM 3.0 sediment concentration of 100% (2.1 and 1.8 mg/L, respectively) and on May 7, 2011 in the laboratory control sediment with Clinch River surface water (2.0mg/L). In both instances (April 18, 19, and May 7, 2011) we added a third water renewal to all controls and investigative sediment replicates. Based on our experience, these brief reductions in test chamber DO values are 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 CRM 1.5:

After 20 days of exposure, *C. dilutus* survival and growth results from the six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of CRM 1.5 (GLC Number: 8889) were compared statistically to the Clinch River reference control sediment sample (GLC Number: 8897). There was no statistically significant reduction ($p \geq 0.05$) in *C. dilutus* survival, growth [measured as AFDW of surviving organisms (mg)], or biomass [AFDW of surviving organisms divided by the initial number of organisms minus pupae and midges (mg)] after 20 days of exposure relative to the Clinch River reference control sediment (Tables 2 and 3). The No-Observed-Effect

Concentration (NOEC) estimate for the 20-day *C. dilutus* survival, growth, and biomass was 100 percent investigative sediment CRM 1.5. Both the Lowest-Observed-Effect-Concentration (LOEC) and the IC_{25} (Inhibition Concentration at 25%) estimates were greater than 100 percent (Table 22).

However, for CRM 1.5 sediment there was a statistical difference in the *C. dilutus* partial life cycle survival and percent emergence when compared to the Clinch River reference control sediment. The NOEC for the *C. dilutus* partial life cycle survival and percent emergence were both 80 percent CRM 1.5 (Table 22). The LOEC for the *C. dilutus* partial life cycle survival and percent emergence were both 100 percent. The IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence were 89.8 and 86.9 percent CRM 1.5, respectively (Table 22).

The total cumulative percent emergence data for all of the treatments of investigative CRM 1.5 are summarized in Table 5.

Investigative Sediment Sample CRM 2.0:

C. dilutus survival (20-day) and growth (20-day) results from the six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of CRM 2.0 (GLC Number: 8891) were compared statistically to the Clinch River reference control sediment sample (GLC Number: 8897). There were no statistically significant reductions ($p \geq 0.05$) in *C. dilutus* survival, growth, or biomass, after 20 days of exposure relative to the Clinch River reference control sediment (Tables 6 and7). The NOEC estimates for the 20-day *C. dilutus* survival, growth, and biomass were all 100 percent. Both the LOEC and the IC_{25} estimates were greater than 100 percent sediment (Table 22).

At test termination, the NOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were 100 percent of sediment CRM 2.0 (Table 22). The LOEC and IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence were greater than 100 percent (Table 22).

The total cumulative percent emergence data for all of the treatments of investigative sample CRM 2.0 are summarized in Table 9.

Investigative Sediment Sample CRM 3.0:

C. dilutus 20 day survival and growth results from the Clinch River reference control sediment sample (GLC Number: 8897) were compared statistically to the six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of CRM 3.0 (GLC Number: 8893). There was no statistically significant reduction ($p \geq 0.05$) in *C. dilutus* survival, growth, or biomass, after 20 days of exposure relative to the Clinch River reference control sediment (Tables 10 and 11). The NOEC estimates for the 20-day *C. dilutus* survival, growth, and biomass were all 100 percent. Both the LOEC and the IC_{25} estimates were greater than 100 percent sediment (Table 22).

The NOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both also 100 percent (Table 22). The LOEC and IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence were both greater than 100 percent CRM 3.0 (Table 22).

The total cumulative percent emergence data for all of the treatments of investigative sample CRM 3.0 are summarized in Table 13.

Investigative Sediment Sample CRM 4.0:

After 20 days of exposure *C. dilutus* survival and growth results from the Clinch River reference control sediment sample (GLC Number: 8897) were compared statistically to the six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of CRM 4.0 (GLC Number: 8895). There was no statistically significant reduction ($p \geq 0.05$) in *C. dilutus* survival, growth, or biomass after 20 days of exposure relative to the Clinch River reference control sediment (Tables 14 and 15). The NOEC estimates for the 20-day *C. dilutus* survival, growth, and biomass were all 100 percent. Both the LOEC and the IC_{25} estimates were greater than 100 percent sediment (Table 22).

The NOEC estimates for the *C. dilutus* partial life cycle survival and percent emergence were both 100 percent CRM 4.0, as were the LOEC and IC_{25} estimates for the *C. dilutus* partial life cycle survival and percent emergence (Table 22).

The total cumulative percent emergence data for all of the treatments of CRM 4.0 are summarized in Table 17.

28-Day *Hyalella azteca*

The *H. azteca* in the 28-day Clinch River reference control sediment, the laboratory control sediments 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 Clinch River reference control sediment had 91.3 percent survival and organisms exposed to the laboratory control sediment with Clinch River surface water had 93.8 percent survival. The organisms exposed to the laboratory control sediment with laboratory water had 100 percent survival, and 96.3 percent of the water only control organisms survived. All control survival data are summarized in Tables 34 and 35. The requirements for acceptable survival and growth for *H. azteca* can be found in the EPA manual /600/R-99/064, Table 15.3.

There was no statistical difference between *H. azteca* survival, growth, or biomass in the laboratory control sediment with Clinch 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 statistical difference between organisms exposed to sediment and those exposed to water only in both growth and biomass. The mean

growth and biomass for *H. azteca* exposed to the laboratory control sediment with laboratory water were both 0.44325 mg. In contrast, the mean growth and biomass for *H. azteca* exposed to water only control were 0.24039 mg and 0.23363 mg, respectively. These data suggest to us 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)).

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

Consequently, the *H. azteca* whole sediment toxicity tests with samples Clinch River reference, CRM 1.5, CRM 2.5, CRM 3.0, and CRM 4.5 are valid assessments of sediment toxicity.

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 CRM 1.5:

Survival and growth results from the 28-day *H. azteca* whole sediment toxicity tests conducted with six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of CRM 1.5 (GLC Number: 8889) were statistically compared to the Clinch River reference sediment sample (GLC Number: 8897). 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 Clinch River reference control sediment (Table 26 and 27). The NOEC for *H. azteca* survival was 100 percent, as were the LOEC and IC_{25} estimates for *H. azteca* survival for sediment sample CRM 1.5 (Table 36).

In contrast, *H. azteca* growth in the surviving organisms of the CRM 1.5 sediment (measured as average dry weight in mg) was significantly reduced when compared to the Clinch River reference control sediment (Tables 27 and 36). The NOEC for *H. azteca* growth was 20 percent, and the LOEC was 40 percent sediment sample CRM 1.5. The IC_{25} estimate for growth was 64.9 percent sediment (Table 36).

The *H. azteca* growth data was also evaluated using biomass and we found a statistically significant reduction in *H. azteca* biomass in investigative sample CRM 1.5 (GLC Number: 8889) when compared to the Clinch River reference control sediment (Tables 27 and 36). The NOEC and LOEC for *H. azteca* biomass was 20 and 40 percent of sediment CRM 1.5, respectively, and the IC_{25} estimate for *H. azteca* biomass was 62.0 percent sediment (Table 36).

The growth data obtained from the 28-day *H. azteca* test produced a non-linear dose-response because the average dry weight of the organisms exposed to the 20 percent sediment concentration was considerably higher than any of the other five test concentrations. We consider this to be an anomaly, the cause of which can only be speculated. Such anomalies are not uncommon when working with sediment dilutions.

Investigative Sediment Sample CRM 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 CRM 2.5 (GLC Number: 8892) were statistically compared to the Clinch River reference sediment sample (GLC Number: 8897). 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 when compared to the Clinch River reference control sediment (Table 28 and 29). However, there was a statistical reduction in *H. azteca* growth and biomass after 28-days. *H. azteca* growth in the CRM 2.5 investigative sediment at test concentrations of 60 percent and 80 percent were statistically different from the Clinch River reference control sediment. Biomass in the 80 percent test concentration of CRM 2.5 was statistically different from biomass in the Clinch River reference control sediment.

The growth and biomass results of the CRM 2.5 investigative sample both show a non-linear dose response, indicating a statistical anomaly rather than an actual biological difference.

The NOEC for *H. azteca* survival, growth, and biomass were all 100 percent CRM 2.5. In addition, the LOEC and IC_{25} estimates for *H. azteca* survival, growth, and biomass were all greater than 100 percent (Table 36).

Investigative Sediment Sample CRM 3.0:

H. azteca 28-day whole sediment toxicity test *s*urvival and growth results for six concentrations (10%, 20%, 40%, 60%, 80%, 100%) of CRM 3.0 (GLC Number: 8893) were statistically compared to the Clinch River reference sediment sample (GLC Number: 8897). There was no statistically significant reduction ($p \geq 0.05$) in *H. azteca* survival, growth or biomass in any the six sediment concentrations after 28 days of exposure relative to the Clinch River reference control sediment (Tables 30 and 31). The NOEC for *H. azteca* survival, growth, and biomass were all 100 percent. In addition, the LOEC and IC_{25} estimates for *H. azteca* survival, growth, and biomass were also greater than 100 percent CRM 3.0 (Table 36).

Investigative Sediment Sample CRM 4.5:

The survival and growth results from the *H. azteca* 28-day whole sediment toxicity test conducted with six concentrations (10%, 20%, 40%, 60%, 80%, and 100%) of CRM 4.5 (GLC Number: 8896) were statistically compared to the Clinch River reference sediment sample (GLC Number: 8897). 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 Clinch River

reference control sediment (Tables 32 and 33). The NOEC for *H. azteca* survival was 100 percent sediment and the IC_{25} estimate survival was greater than 100 percent for (Table 36).

However, both *H. azteca* growth and biomass in the surviving organisms of the CRM 4.5 sediment were significantly reduced relative to the Clinch River reference control sediment (Tables 33 and 36). The NOEC and LOEC estimates for the 28-day *H. azteca* growth and biomass were 60 percent and 80 percent CRM 4.5, respectively. In addition, the IC_{25} estimates for growth and biomass were 67.3 and 66.4 percent CRM 4.5, 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 7.78 mg/L for *C. dilutus* and 4.47 mg/L for *H. azteca*. Those 96-hour LC_{50} values were within ± 2 standard deviations of GLEC's in house mean LC_{50} toxicity values. The summarized control charts are provided in Appendix G. At test termination 100 percent of the control organisms in both the *C. dilutus* and *H. azteca* reference toxicant tests were alive.

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, and 20-day biomass, and test termination endpoints for partial life cycle percent survival and percent emergence toxicity tests.

After 51 days, the *C. dilutus* exposed to the four investigative sediment samples (CRM 1.5, CRM 2.0, CRM 3.0, and CRM 4.0) showed no statistically significant reduction in the 20-day survival, 20-day growth, or 20-day biomass endpoints in the whole sediment toxicity tests. However, investigative sediment sample CRM 1.5 showed a statistically significant effect on *C. dilutus* partial life cycle survival and percent emergence relative to the Clinch River reference sediment control.

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 not statistically different in any of the four investigative samples (CRM 1.5, CRM 2.5, CRM 3.0, and CRM 4.5) relative to the Clinch River reference control sediment. However, in investigative sediment samples CRM 1.5, CRM 2.5, and CRM 4.5, growth (expressed as growth or biomass) was statistically reduced relative to the Clinch River reference control sediment organisms.

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 and Biomass Endpoints for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted March 24-May 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 +CRW		T					T			T	T	
CRS + CRW			T	T	T					T		
CRM 1.5-10%			T					T		T		T
CRM 1.5-20%						T			T		T	T
CRM 1.5-40%	T			T						T	T	
CRM 1.5-60%				T			T			T	T	
CRM 1.5-80%							T		T		T	T
CRM 1.5-100%			T		T			T				T
CRM 2.0-10%		T	T				T			T		
CRM 2.0-20%			T	T				T				T
CRM 2.0-40%	T		T	T	T							
CRM 2.0-60%				T					T		T	T
CRM 2.0-80%	T			T	T							T
CRM 2.0-100%			T		T	T				T		
CRM 3.0-10%	T		T						T	T		
CRM 3.0-20%	T				T					T		T
CRM 3.0-40%					T				T	T	T	
CRM 3.0-60%			T	T					T	T		
CRM 3.0-80%	T									T	T	T
CRM 3.0-100%				T	T			T				T
CRM 4.0-10%		T			T			T			T	
CRM 4.0-20%		T		T				T		T		
CRM 4.0-40%			T	T							T	T
CRM 4.0-60%					T			T		T	T	
CRM 4.0-80%	T		T						T			T
CRM 4.0-100%	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 Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 1.5 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 March 24-May 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Clinch River Water CRM 7.0	Clinch River Reference Control	CRM 1.5-10%	CRM 1.5-20%	CRM 1.5-40%	CRM 1.5-60%	CRM 1.5-80%	CRM 1.5-100%
	LCS+CRW	CRS+CRW GLC# 8897	GLC# 8889	GLC# 8889	GLC# 8889	GLC# 8889	GLC# 8889	GLC# 8889
Random Replicate Numbers: Refer to Table 1.	10	12	12	12	12	11	12	10
	10	12	12	10	12	11	10	12
	10	9	12	11	12	12	12	12
	12	11	12	12	10	12	11	11
20-Day Percent Survival	**87.5**	**91.7**	**100.0**	**93.8**	**95.8**	**95.8**	**93.8**	**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 Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 1.5 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 1.5-10%		CRM 1.5-20%		CRM 1.5-40%		CRM 1.5-60%		CRM 1.5-80%		CRM 1.5-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889	
	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.	1.21100	1.00917	0.77000	0.77000	0.81833	0.81833	1.03600	1.03600	0.95000	0.95000	1.06636	0.97750	0.90083	0.90083	1.29600	1.08000
	1.27800	1.06500	0.91167	0.91167	1.23600	1.23600	0.97900	0.81583	0.85417	0.85417	0.84546	0.77500	1.26100	1.05083	0.94250	0.94250
	1.04800	0.87333	1.25222	0.93917	0.95417	0.95417	1.03818	0.95167	0.97500	0.97500	1.01417	1.01417	1.02417	1.02417	1.10417	1.10417
	0.82333	0.82333	1.04909	0.96167	1.09455	1.09455	0.92750	0.92750	1.01300	0.84417	0.83000	0.83000	1.19909	1.09917	1.38500	1.25909
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.09008**		**0.99575**		**1.02576**		**0.99517**		**0.94804**		**0.93900**		**1.09627**		**1.18192**	
Average (AFDW) Biomass[2] Weight (mg)		**0.94271**		**0.89563**		**1.02576**		**0.93275**		**0.90584**		**0.89917**		**1.01875**		**1.09644**
20-Day Percent Survival	**87.5**		**91.7**		**100.0**		**93.8**		**95.8**		**95.8**		**93.8**		**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 midges

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test initiation = 0.18813mg

TABLE 4. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 1.5 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 1.5-10%		CRM 1.5-20%		CRM 1.5-40%		CRM 1.5-60%		CRM 1.5-80%		CRM 1.5-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889	
	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment
Random Replicate Numbers: Refer to Table 1.	8	0	12	0	9	2	8	1	12	0	10	0	7	0	5	0
	9	0	10	0	12	0	10	1	9	1	7	0	8	2	7	0
	10	0	10	0	9	0	9	1	5	0	12	0	7	1	6	0
	11	0	6	0	8	1	9	0	12	0	7	2	9	0	6	0
	11	0	7	0	9	0	6	1	8	0	7	2	7	1	10	0
	9	0	12	0	4	2	10	0	9	0	10	0	7	1	6	0
	6	0	7	0	12	0	7	2	9	0	10	0	8	1	5	0
	8	0	11	0	12	0	10	0	8	0	7	1	6	0	6	0
Partial Life Cycle[1] Survival (%)	75.0		78.1		83.3		78.1		76.0		78.1		67.7		53.1 [a]	
Percent Emergence[2] (%)	75.0		78.1		78.1		71.9		75.0		72.9		61.5		53.1 [a]	
Average Time (Days) to First Emergence	24		24		25		22		24		24		23		23	

[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 Clinch River Reference Control Sediment (GLC# 8897)

TABLE 5. Summary of the Total Percent Cumulative Emergence Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 1.5 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 March 24-May 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**	**CRM 1.5-10%**	**CRM 1.5-20%**	**CRM 1.5-40%**	**CRM 1.5-60%**	**CRM 1.5-80%**	**CRM 1.5-100%**
		LCS+CRW	**GLC# 8897**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**
4/12/2011	19	0	0	0	0	0	0	1	0
4/13/2011	20	0	0	0	1	0	0	1	1
4/14/2011	21	1	1	2	6	2	1	3	9
4/15/2011	22	7	4	2	8	4	2	7	9
4/16/2011	23	12	4	4	11	7	6	8	10
4/17/2011	24	13	6	5	12	12	6	9	11
4/18/2011	25	18	14	6	20	15	12	12	12
4/19/2011	26	21	20	9	21	17	14	14	12
4/20/2011	27	23	23	13	22	20	17	18	17
4/21/2011	28	28	24	18	24	24	17	19	17
4/22/2011	29	35	30	26	30	36	21	21	19
4/23/2011	30	39	32	30	32	42	31	23	22
4/24/2011	31	45	34	36	37	48	34	25	25
4/25/2011	32	50	38	45	41	52	39	32	29
4/26/2011	33	53	44	50	45	55	47	41	32
4/27/2011	34	56	46	54	49	57	49	45	36
4/28/2011	35	57	50	56	50	60	50	49	37
4/29/2011	36	60	55	60	53	60	55	52	40
4/30/2011	37	64	58	65	57	62	61	54	43
5/1/2011	38	66	61	68	60	65	62	55	45
5/2/2011	39	69	64	68	64	69	66	56	45
5/3/2011	40	69	65	70	66	70	69	58	47
5/4/2011	41	71	69	73	66	70	70	59	48
5/5/2011	42	71	70	75	67	71	70	59	49
5/6/2011	43	72	73	75	67	71	70	59	50
5/7/2011	44	72	75	75	67	72	70	59	51
5/8/2011	45	72	75	75	69	72	70	59	51
5/9/2011	46	72	75	75	69	72	70	59	51
5/10/2011	47	72	75	75	69	72	70	59	51
5/11/2011	48	72	75	75	69	72	70	59	51
5/12/2011	49	72	75	75	69	72	70	59	51
5/13/2011	50	72	75	75	69	72	70	59	51
5/14/2011	51								
Total Number of Emerged		72	75	75	69	72	70	59	51
Total Percent Cumulative Emergence[1]		75.0	78.1	78.1	71.9	75.0	72.9	61.5	53.1

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 6. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 2.0 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 March 24-May 14, 2011.

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Clinch River Water CRM 7.0	Clinch River Reference Control	CRM 2.0-10%	CRM 2.0-20%	CRM 2.0-40%	CRM 2.0-60%	CRM 2.0-80%	CRM 2.0-100%
	LCS+CRW	CRS+CRWG LC# 8897	GLC# 8891	GLC# 8891	GLC# 8891	GLC# 8891	GLC# 8891	GLC# 8891
Random Replicate Numbers: Refer to Table 1.	10	12	12	12	12	10	12	9
	10	12	12	12	12	12	11	11
	10	9	10	12	11	12	12	11
	12	11	10	12	12	12	12	12
20-Day Percent Survival	**87.5**	**91.7**	**91.7**	**100.0**	**97.9**	**95.8**	**97.9**	**89.6**

[r] Replicates initiated with 12 organisms each

TABLE 7. **Comparison of Average[1] Ash-Free-Dry Weight (AFDW) (mg), Biomass[2] (AFDW) (mg) and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 2.0 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 2.0-10%		CRM 2.0-20%		CRM 2.0-40%		CRM 2.0-60%		CRM 2.0-80%		CRM 2.0-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8891		GLC# 8891		GLC# 8891		GLC# 8891		GLC# 8891		GLC# 8891	
	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.	1.21100	1.00917	0.77000	0.77000	1.10273	1.10273	0.96917	0.96917	1.32417	1.32417	1.12556	0.92091	1.37083	1.37083	1.48875	1.08273
	1.27800	1.06500	0.91167	0.91167	1.06083	1.06083	1.10750	1.10750	0.89917	0.89917	1.15417	1.15417	1.21364	1.11250	0.69363	0.63583
	1.04800	0.87333	1.25222	0.93917	1.35556	1.10909	0.97583	0.97583	1.31727	1.20750	0.98917	0.98917	1.00750	1.00750	1.26000	1.14545
	0.82333	0.82333	1.04909	0.96167	1.33800	1.11500	1.01167	1.01167	1.01250	1.01250	1.00750	1.00750	1.20833	1.20833	1.39500	1.39500
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.09008**		**0.99575**		**1.21428**		**1.01604**		**1.13828**		**1.06910**		**1.20008**		**1.20935**	
Average (AFDW) Biomass[2] Weight (mg)		**0.94271**		**0.89563**		**1.09691**		**1.01604**		**1.11084**		**1.01794**		**1.17479**		**1.06475**
20-Day Percent Survival	**87.5**		**91.7**		**91.7**		**100.0**		**97.9**		**95.8**		**97.9**		**89.6**	

[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 midges

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test initiation = 0.18813mg

TABLE 8. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 2.0 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 2.0-10%		CRM 2.0-20%		CRM 2.0-40%		CRM 2.0-60%		CRM 2.0-80%		CRM 2.0-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8891		GLC# 8891		GLC# 8891		GLC# 8891		GLC# 8891		GLC# 8891	
	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment
Random Replicate Numbers: Refer to Table 1.	8	0	12	0	10	1	12	0	10	0	12	0	12	0	10	0
	9	0	10	0	8	0	7	0	10	0	6	2	8	0	8	0
	10	0	10	0	5	1	11	0	10	0	8	2	9	0	9	0
	11	0	6	0	11	0	11	0	8	0	9	0	10	1	10	0
	11	0	7	0	9	0	8	0	3	1	5	0	6	0	7	0
	9	0	12	0	10	0	8	0	11	0	8	2	10	0	8	0
	6	0	7	0	12	0	7	0	12	0	11	0	9	0	11	0
	8	0	11	0	7	1	12	0	12	0	8	1	6	1	8	0
Partial Life Cycle[1] Survival (%)	75.0		78.1		78.1		79.2		80.2		77.1		75.0		74.0	
Percent Emergence[2] (%)	75.0		78.1		75.0		79.2		79.2		69.8		72.9		74.0	
Average Time (Days) to First Emergence	24		24		23		23		26		25		24		26	

[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.

TABLE 9. Summary of the Total Percent Cumulative Emergence Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 2.0 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 March 24-May 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**	**CRM 2.0-10%**	**CRM 2.0-20%**	**CRM 2.0-40%**	**CRM 2.0-60%**	**CRM 2.0-80%**	**CRM 2.0-100%**
		LCS+CRW	**GLC# 8897**	**GLC# 8891**	**GLC# 8891**	**GLC# 8891**	**GLC# 8891**	**GLC# 8891**	**GLC# 8891**
4/12/2011	19	0	0	1	0	0	0	0	0
4/13/2011	20	0	0	3	0	0	0	1	0
4/14/2011	21	1	1	5	1	1	1	2	1
4/15/2011	22	7	4	6	5	1	1	2	3
4/16/2011	23	12	4	9	9	3	3	3	4
4/17/2011	24	13	6	9	12	3	5	7	5
4/18/2011	25	18	14	14	14	5	8	15	5
4/19/2011	26	21	20	18	18	6	13	15	9
4/20/2011	27	23	23	24	21	7	18	21	14
4/21/2011	28	28	24	26	24	11	23	23	19
4/22/2011	29	35	30	32	28	17	27	28	24
4/23/2011	30	39	32	34	32	26	34	32	24
4/24/2011	31	45	34	38	33	29	42	33	26
4/25/2011	32	50	38	45	39	36	48	37	34
4/26/2011	33	53	44	46	46	40	53	44	38
4/27/2011	34	56	46	50	49	47	56	47	48
4/28/2011	35	57	50	53	51	51	59	48	52
4/29/2011	36	60	55	53	55	55	59	54	56
4/30/2011	37	64	58	57	59	58	60	60	57
5/1/2011	38	66	61	60	60	61	62	64	61
5/2/2011	39	69	64	60	64	63	63	67	63
5/3/2011	40	69	65	62	66	65	64	68	65
5/4/2011	41	71	69	68	66	68	64	68	67
5/5/2011	42	71	70	71	73	73	66	69	70
5/6/2011	43	72	73	71	74	73	67	69	71
5/7/2011	44	72	75	71	74	75	67	69	71
5/8/2011	45	72	75	72	75	76	67	69	71
5/9/2011	46	72	75	72	75	76	67	70	71
5/10/2011	47	72	75	72	75	76	67	70	71
5/11/2011	48	72	75	72	76	76	67	70	71
5/12/2011	49	72	75	72	76	76	67	70	71
5/13/2011	50	72	75	72	76	76	67	70	71
5/14/2011	51								
Total Number of Emerged		72	75	72	76	76	67	70	71
Total Percent Cumulative Emergence[1]		75.0	78.1	75.0	79.2	79.2	69.8	72.9	74.0

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 10. **Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 3.0 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 March 24-May 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Clinch River Water CRM 7.0	Clinch River Reference Control	CRM 3.0-10%	CRM 3.0-20%	CRM 3.0-40%	CRM 3.0-60%	CRM 3.0-80%	CRM 3.0-100%
	LCS+CRW	CRS+CRW GLC# 8897	GLC# 8893	GLC# 8893	GLC# 8893	GLC# 8893	GLC# 8893	GLC# 8893
Random Replicate Numbers: Refer to Table 1.	10	12	12	8	9	9	11	12
	10	12	12	7	11	10	10	11
	10	9	7	11	12	11	12	12
	12	11	9	10	12	12	12	12
20-Day Percent Survival	**87.5**	**91.7**	**83.3**	**75.0**	**91.7**	**87.5**	**93.8**	**97.9**

[r] Replicates initiated with 12 organisms each

TABLE 11. **Comparison of Average[1] Ash-Free-Dry Weight (AFDW) (mg), Biomass[2] (AFDW) (mg) and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 3.0 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 3.0-10%		CRM 3.0-20%		CRM 3.0-40%		CRM 3.0-60%		CRM 3.0-80%		CRM 3.0-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893	
	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.	1.21100	1.00917	0.77000	0.77000	0.74917	0.74917	1.39333	0.83600	1.49000	1.08364	1.40125	1.01909	1.08273	0.99250	1.22250	1.22250
	1.27800	1.06500	0.91167	0.91167	0.82417	0.82417	2.30800	1.15400	1.19455	1.09500	1.16300	0.96917	1.39000	1.15833	1.32545	1.21500
	1.04800	0.87333	1.25222	0.93917	1.98000	0.99000	1.05636	0.96833	1.12083	1.12083	1.20909	1.10833	0.82250	0.82250	1.24333	1.24333
	0.82333	0.82333	1.04909	0.96167	1.52250	1.10727	1.53000	1.25182	0.74917	0.74917	1.30667	1.30667	1.23750	1.23750	1.48667	1.48667
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.09008**		**0.99575**		**1.26896**		**1.57192**		**1.13864**		**1.27000**		**1.13318**		**1.31949**	
Average (AFDW) Biomass[2] Weight (mg)		**0.94271**		**0.89563**		**0.91765**		**1.05254**		**1.01216**		**1.10082**		**1.05271**		**1.29188**
20-Day Percent Survival	**87.5**		**91.7**		**83.3**		**75.0**		**91.7**		**87.5**		**93.8**		**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 midges

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test initiation = 0.18813mg

TABLE 12. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 3.0 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 3.0-10%		CRM 3.0-20%		CRM 3.0-40%		CRM 3.0-60%		CRM 3.0-80%		CRM 3.0-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893	
	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment
Random Replicate Numbers: Refer to Table 1.	8	0	12	0	10	0	7	2	8	1	8	0	10	0	9	0
	9	0	10	0	8	2	8	1	11	0	8	1	11	0	9	0
	10	0	10	0	9	0	10	0	9	0	9	0	10	0	9	0
	11	0	6	0	6	0	7	0	9	2	7	1	9	0	5	0
	11	0	7	0	8	1	7	1	8	0	6	1	7	1	7	1
	9	0	12	0	11	0	8	0	6	0	11	0	8	0	10	1
	6	0	7	0	10	1	8	0	9	1	7	0	6	0	12	0
	8	0	11	0	6	0	9	1	9	2	11	0	9	0	9	1
Partial Life Cycle[1] Survival (%)	75.0		78.1		75.0		71.9		78.1		72.9		74.0		76.0	
Percent Emergence[2] (%)	75.0		78.1		70.8		66.7		71.9		69.8		72.9		72.9	
Average Time (Days) to First Emergence	24		24		23		23		23		23		24		23	

[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.

TABLE 13. **Summary of the Total Percent Cumulative Emergence Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 3.0 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 March 24-May 14, 2011.**

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Clinch River**	**Clinch River Reference Control**	**CRM 3.0-10%**	**CRM 3.0-20%**	**CRM 3.0-40%**	**CRM 3.0-60%**	**CRM 3.0-80%**	**CRM 3.0-100%**
		LCS+CRW	**GLC# 8897**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**
4/12/2011	19	0	0	0	0	0	0	0	1
4/13/2011	20	0	0	0	0	0	0	0	2
4/14/2011	21	1	1	3	2	4	5	2	3
4/15/2011	22	7	4	9	4	8	7	4	7
4/16/2011	23	12	4	11	6	11	7	5	7
4/17/2011	24	13	6	12	7	14	11	7	8
4/18/2011	25	18	14	14	11	16	16	12	15
4/19/2011	26	21	20	16	16	21	20	19	22
4/20/2011	27	23	23	22	19	24	25	22	23
4/21/2011	28	28	24	25	21	27	26	28	26
4/22/2011	29	35	30	31	27	30	31	30	34
4/23/2011	30	39	32	35	31	35	36	37	36
4/24/2011	31	45	34	40	35	39	41	43	40
4/25/2011	32	50	38	43	39	44	44	46	46
4/26/2011	33	53	44	45	40	47	49	52	49
4/27/2011	34	56	46	47	40	53	52	56	53
4/28/2011	35	57	50	50	42	55	55	57	54
4/29/2011	36	60	55	54	45	56	57	59	57
4/30/2011	37	64	58	56	50	58	60	61	61
5/1/2011	38	66	61	56	50	63	61	63	62
5/2/2011	39	69	64	61	54	65	64	65	63
5/3/2011	40	69	65	61	56	66	65	65	63
5/4/2011	41	71	69	64	61	66	65	67	66
5/5/2011	42	71	70	66	62	68	65	67	67
5/6/2011	43	72	73	67	62	69	66	67	68
5/7/2011	44	72	75	68	63	69	67	68	68
5/8/2011	45	72	75	68	63	69	67	70	69
5/9/2011	46	72	75	68	64	69	67	70	70
5/10/2011	47	72	75	68	64	69	67	70	70
5/11/2011	48	72	75	68	64	69	67	70	70
5/12/2011	49	72	75	68	64	69	67	70	70
5/13/2011	50	72	75	68	64	69	67	70	70
5/14/2011	51								
Total Number of Emerged		72	75	68	64	69	67	70	70
Total Percent Cumulative Emergence[1]		75.0	78.1	70.8	66.7	71.9	69.8	72.9	72.9

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 Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 4.0 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 March 24-May 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]							
	Laboratory Control with Clinch River Water CRM 7.0	Clinch River Reference Control	CRM 4.0-10%	CRM 4.0-20%	CRM 4.0-40%	CRM 4.0-60%	CRM 4.0-80%	CRM 4.0-100%
	LCS+CRW	CRS+CRW GLC# 8897	GLC# 8895	GLC# 8895	GLC# 8895	GLC# 8895	GLC# 8895	GLC# 8895
Random Replicate Numbers: Refer to Table 1.	10	12	12	12	12	11	12	12
	10	12	12	12	12	12	12	12
	10	9	12	10	11	12	12	9
	12	11	12	12	10	11	12	12
20-Day Percent Survival	**87.5**	**91.7**	**100.0**	**95.8**	**93.8**	**95.8**	**100.0**	**93.8**

[r] Replicates initiated with 12 organisms each

TABLE 15. **Comparison of Average[1] Ash-Free-Dry Weight (AFDW) (mg), Biomass[2] (AFDW) (mg) and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 4.0 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 4.0-10%		CRM 4.0-20%		CRM 4.0-40%		CRM 4.0-60%		CRM 4.0-80%		CRM 4.0-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8895		GLC# 8895		GLC# 8895		GLC# 8895		GLC# 8895		GLC# 8895	
	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.	1.21100	1.00917	0.77000	0.77000	0.98364	0.98364	1.19000	1.19000	1.16583	1.16583	1.07636	0.98667	1.23000	1.23000	0.89000	0.89000
	1.27800	1.06500	0.91167	0.91167	1.06417	1.06417	0.98917	0.98917	1.02750	1.02750	1.04750	1.04750	1.80500	1.80500	0.97667	0.97667
	1.04800	0.87333	1.25222	0.93917	1.15417	1.15417	1.30000	1.04000	0.76000	0.69667	1.27545	1.27546	0.98083	0.98083	1.31333	0.98500
	0.82333	0.82333	1.04909	0.96167	1.07000	1.07000	1.29909	1.29909	1.12000	0.84000	1.28727	1.18000	1.11667	1.11667	1.04417	1.04417
Average[1] Ash-Free-Dry-Weight (AFDW) (mg)	**1.09008**		**0.99575**		**1.06800**		**1.19457**		**1.01833**		**1.17165**		**1.28313**		**1.05604**	
Average (AFDW) Biomass[2] Weight (mg)		**0.94271**		**0.89563**		**1.06800**		**1.12957**		**0.93250**		**1.12241**		**1.28313**		**0.97396**
20-Day Percent Survival	**87.5**		**91.7**		**100.0**		**95.8**		**93.8**		**95.8**		**100.0**		**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 midges

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test initiation = 0.18813mg

TABLE 16. **Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 4.0 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 March 24-May 14, 2011.**

	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 4.0-10%		CRM 4.0-20%		CRM 4.0-40%		CRM 4.0-60%		CRM 4.0-80%		CRM 4.0-100%	
	LCS+CRW		CRS+CRW GLC# 8897		GLC# 8895		GLC# 8895		GLC# 8895		GLC# 8895		GLC# 8895		GLC# 8895	
	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment
Random Replicate Numbers: Refer to Table 1.	8	0	12	0	9	0	9	0	9	1	10	0	10	1	9	0
	9	0	10	0	7	1	9	1	12	0	10	0	10	0	7	0
	10	0	10	0	9	0	8	1	8	0	8	0	6	0	6	0
	11	0	6	0	7	2	8	0	8	1	8	0	12	0	6	0
	11	0	7	0	9	0	9	0	8	0	9	0	7	1	10	0
	9	0	12	0	8	0	6	0	12	0	10	0	12	0	9	0
	6	0	7	0	8	0	8	0	9	0	9	0	7	0	5	0
	8	0	11	0	9	0	12	0	8	0	6	0	5	0	6	0
Partial Life Cycle[1] Survival (%)	75.0		78.1		71.9		74.0		79.2		72.9		74.0		60.4	
Percent Emergence[2] (%)	75.0		78.1		68.8		71.9		77.1		72.9		71.9		60.4	
Average Time (Days) to First Emergence	24		24		24		24		24		25		25		25	

[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.

TABLE 17. Summary of the Total Percent Cumulative Emergence Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 4.0 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 March 24-May 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration							
Date of Emergence	**Test Day**	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**	**CRM 4.0-10%**	**CRM 4.0-20%**	**CRM 4.0-40%**	**CRM 4.0-60%**	**CRM 4.0-80%**	**CRM 4.0-100%**
		LCS+CRW	**GLC# 8897**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**
4/12/2011	19	0	0	0	0	0	0	0	0
4/13/2011	20	0	0	0	1	1	0	0	0
4/14/2011	21	1	1	0	1	2	0	1	1
4/15/2011	22	7	4	4	2	6	1	2	1
4/16/2011	23	12	4	6	5	10	1	5	4
4/17/2011	24	13	6	9	7	10	5	9	8
4/18/2011	25	18	14	13	12	12	9	12	10
4/19/2011	26	21	20	17	13	19	14	14	14
4/20/2011	27	23	23	24	14	26	15	20	15
4/21/2011	28	28	24	25	19	31	17	20	16
4/22/2011	29	35	30	30	20	36	25	24	25
4/23/2011	30	39	32	31	25	43	28	28	28
4/24/2011	31	45	34	36	28	50	33	32	30
4/25/2011	32	50	38	39	30	50	35	36	33
4/26/2011	33	53	44	42	33	53	41	42	37
4/27/2011	34	56	46	43	42	55	48	43	44
4/28/2011	35	57	50	45	44	60	52	43	46
4/29/2011	36	60	55	47	50	62	55	47	49
4/30/2011	37	64	58	51	51	64	55	48	50
5/1/2011	38	66	61	55	58	66	58	50	51
5/2/2011	39	69	64	58	60	71	62	53	52
5/3/2011	40	69	65	58	62	72	64	56	54
5/4/2011	41	71	69	64	66	74	66	60	55
5/5/2011	42	71	70	64	66	74	67	61	56
5/6/2011	43	72	73	64	67	74	70	62	56
5/7/2011	44	72	75	65	68	74	70	66	57
5/8/2011	45	72	75	65	68	74	70	68	58
5/9/2011	46	72	75	65	68	74	70	69	58
5/10/2011	47	72	75	66	69	74	70	69	58
5/11/2011	48	72	75	66	69	74	70	69	58
5/12/2011	49	72	75	66	69	74	70	69	58
5/13/2011	50	72	75	66	69	74	70	69	58
5/14/2011	51								
Total Number of Emerged		72	75	66	69	74	70	69	58
Total Percent Cumulative Emergence[1]		75.0	78.1	68.8	71.9	77.1	72.9	71.9	60.4

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 Control Water, the Water Only Control and Laboratory Control Sediment with Clinch River Water (CRM 7.0) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted March 24-May 14, 2011.**

	Number Test Organisms Surviving per Replicate[r]			
	Laboratory Control with Laboratory Water	Water Only Control	Laboratory Control with Clinch River	Clinch River Reference Control
	LCS+GLW	GLW	LCS+CRW	CRS+CRW GLC# 8897
Random Replicate Numbers: Refer to Table 1.	12	10	10	12
	12	11	10	12
	9	12	10	9
	11	12	12	11
20-Day Percent Survival	91.7	93.8	87.5	91.7

[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 Control Water, the Water Only Control and Laboratory Control Sediment with Clinch River Water (CRM 7.0) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* 20-Day Endpoints of the Partial Life Cycle Whole Sediment Toxicity Tests Conducted March 24-May 14, 2011.

	Laboratory Control with Laboratory Water		Water Only Control		Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control	
	LCS+GLW		GLW		LCS+CRW		CRS+CRW GLC# 8897	
	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.	1.54667	1.54667	0.86667	0.70909	1.21100	1.00917	0.77000	0.77000
	1.64667	1.64667	0.88363	0.81000	1.27800	1.06500	0.91167	0.91167
	1.44222	1.08167	0.71500	0.71500	1.04800	0.87333	1.25222	0.93917
	1.39364	1.27750	0.69000	0.69000	0.82333	0.82333	1.04909	0.96167
Average[1] Dry Weight (mg)	**1.50730**		**0.78883** [b]		**1.09008** [b]		**0.99575**	
Average Biomass[2] Weight (mg)		**1.38813**		**0.73102** [b]		**0.94271** [b]		**0.89563**
20-Day Percent Survival	**91.7**		**93.8**		**87.5**		**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 midges

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

Note: Average Ash-Free-Dry Weight of Chironomus dilutus at test initiation = 0.18813mg

TABLE 20.

Comparison of Partial Life Cycle[1] Survival (percent) and Percent Emergence[2] Between the Laboratory Control Sediment with Laboratory Control Water, the Water Only Control and Laboratory Control Sediment with Clinch River Water (CRM 7.0) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted March 24-May 14, 2011.

REPLICATE #	Laboratory Control with Laboratory Water		Water Only Control		Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control	
	LCS+GLW		GLW		LCS+CRW		CRS+CRW GLC# 8897	
	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment	Number of Emerged	Number of live in Sediment
Random Replicate Numbers: Refer to Table 1.	12	0	10	0	8	0	12	0
	8	0	12	0	9	0	10	0
	9	1	12	0	10	0	10	0
	9	0	10	0	11	0	6	0
	9	0	12	0	11	0	7	0
	8	0	6	0	9	0	12	0
	8	0	5	0	6	0	7	0
	10	0	12	0	8	0	11	0
Partial Life Cycle[1] Survival (%)	77.1		82.3		75.0		78.1	
Percent Emergence[2] (%)	76.0		82.3		75.0		78.1	
Average Time (Days) to First Emergence	22		26		24		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 Control Water, Water Only Control, and Laboratory Control Sediment with Clinch River Water (CRM 7.0) and the Clinch River Reference Control Sediment Sample for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Partial Life Cycle Whole Sediment Toxicity Tests Conducted March 24-May 14, 2011.

		Cumulative Number of Emerged Test Organisms per Test Concentration			
Date of Emergence	Test Day	Laboratory Control with Laboratory Water	Water Only Control	Laboratory Control with Clinch River	Clinch River Reference Control
		LCS+GLW	GLW Only	LCS+CRW	GLC# 8897
4/12/2011	19	0	0	0	0
4/13/2011	20	1	0	0	0
4/14/2011	21	7	1	1	1
4/15/2011	22	9	2	7	4
4/16/2011	23	12	4	12	4
4/17/2011	24	17	4	13	6
4/18/2011	25	20	7	18	14
4/19/2011	26	22	11	21	20
4/20/2011	27	27	15	23	23
4/21/2011	28	30	18	28	24
4/22/2011	29	37	22	35	30
4/23/2011	30	39	26	39	32
4/24/2011	31	44	29	45	34
4/25/2011	32	48	35	50	38
4/26/2011	33	53	42	53	44
4/27/2011	34	53	46	56	46
4/28/2011	35	56	49	57	50
4/29/2011	36	62	57	60	55
4/30/2011	37	66	59	64	58
5/1/2011	38	66	62	66	61
5/2/2011	39	67	67	69	64
5/3/2011	40	70	70	69	65
5/4/2011	41	71	71	71	69
5/5/2011	42	71	74	71	70
5/6/2011	43	71	76	72	73
5/7/2011	44	71	78	72	75
5/8/2011	45	73	79	72	75
5/9/2011	46	73	79	72	75
5/10/2011	47	73	79	72	75
5/11/2011	48	73	79	72	75
5/12/2011	49	73	79	72	75
5/13/2011	50	73	79	72	75
5/14/2011	51				
Total Number of Emerged		73	79	72	75
Total Percent Cumulative Emergence[1]		76.0	82.3	75.0	78.1

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 Average Growth, 20-Day Biomass, Partial Life Cycle Survival, and Emergence for Investigative Sediment Samples CRM1.5, CRM 2.5, CRM 3.0, and CRM 4.0 (test sediment Concentrations 10%, 20%, 40%, 60%, 80%, and 100%) for the Tennessee Valley Authority (TVA) *Chironomus dilutus* Whole Sediment Toxicity Tests Conducted March 24-May 14, 2011.

Sample ID	20-Day Survival (percent sediment)			20-Day Growth (percent sediment)			20-Day Biomass (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}
CRM 1.5	100	>100	>100	100	>100	>100	100	>100	>100	80	100	89.8	80	100	86.9
GLC #8889															
CRM 2.0	100	>100	>100	100	>100	>100	100	>100	>100	100	>100	>100	100	>100	>100
GLC #8891															
CRM 3.0	100	>100	>100	100	>100	>100	100	>100	>100	100	>100	>100	100	>100	>100
GLC #8893															
CRM 4.0	100	>100	>100	100	>100	>100	100	>100	>100	100	>100	>100	100	>100	>100
GLC #8895															

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) Clinch River *Chironomus dilutus* Partial Life-Cycle Whole Sediment Toxicity Tests Conducted March 24- May 14, 2011.**

Sample ID GLC No.	**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)
Clinch River Reference Control GLC No.: 8897	**22.9** (22.0-23.6) n=96	**7.72** (7.48-7.97) n=46	**4.4** (2.9-6.7) n=92	**295** (276-319) n=22	**117** (108-126) n=2	**138** (136-140) n=2	**0.19** (0.01-0.50) n=3
LCS & CRW Laboratory Control Sediment with Clinch River Water-CRM 7.0	**22.9** (22.0-23.6) n=94	**7.59** (7.38-7.94) n=44	**3.5** (1.3-7.3) n=90	**301** (274-352) n=20	**117** (114-120) n=2	**142** (136-148) n=2	**0.11** (0.04-0.24) n=3
LCS & GLW Laboratory Control Sediment with Laboratory Water	**22.9** (21.7-23.6) n=101	**7.55** (7.25-7.85) n=47	**3.6** (1.7-6.5) n=93	**317** (283-398) n=23	**123** (108-138) n=2	**156** (148-164) n=2	**0.10** (0.0-0.22) n=3
GLW Laboratory Water Only	**22.9** (22.2-23.6) n=102	**7.66** (7.35-8.07) n=48	**5.2** (2.6-8.0) n=95	**302** (296-306) n=24	**109** (104-114) n=2	**134** (132-136) n=2	**0.09J** (0.00-0.17) n=3

J = Between MDL (0.04) and RL (0.1)

TABLE 24. **Summary of Mean Water Quality Parameters for Sediments CRM 1.5 and CRM 2.0 of Test Exposure Water Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Clinch River *Chironomus dilutus* Partial Life-Cycle Whole Sediment Toxicity Tests Conducted March 24- May 14, 2011.**

Sample ID GLC No.	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)
CRM 1.5 10% GLC No.: 8889	**22.9** (22.3-23.7) n=97	**7.78** (7.52-8.17) n=45	**4.7** (2.6-6.7) n=91	**301** (278-320) n=21	**126** (114-138) n=2	**152** (144-160) n=2	**0.16** (0.02-0.24) n=3
CRM 1.5 20% GLC No.: 8889	**22.8** (21.9-23.7) n=102	**7.82** (7.58-8.20) n=48	**4.7** (2.6-6.7) n=96	**299** (282-318) n=24	**116** (108-124) n=2	**138** (136-140) n=2	**0.12** (0.0-0.36) n=3
CRM 1.5 40% GLC No.: 8889	**22.9** (22.4-23.8) n=100	**7.78** (7.60-8.06) n=48	**4.7** (3.3-6.8) n=94	**297** (277-320) n=24	**115** (110-120) n=2	**132** (128-136) n=2	**0.17** (0.01-0.47) n=3
CRM 1.5 60% GLC No.: 8889	**22.9** (22.4-23.7) n=98	**7.75** (7.53-8.01) n=46	**4.7** (2.9-6.7) n=92	**299** (277-344) n=22	**112** (108-116) n=2	**136** (136-136) n=2	**0.09J** (0.00-0.25) n=3
CRM 1.5 80% GLC No.: 8889	**22.9** (22.5-23.7) n=98	**7.72** (7.48-8.04) n=46	**4.7** (2.6-6.8) n=92	**292** (270-309) n=22	**112** (112-112) n=2	**136** (136-136) n=2	**0.06J** (0.0-0.16) n=3
CRM 1.5 100% GLC No.: 8889	**22.9** (22.3-23.7) n=98	**7.71** (7.55-7.94) n=46	**4.7** (2.7-6.9) n=92	**290** (273-305) n=22	**108** (108-108) n=2	**140** (136-144) n=2	**0.04J** (0.00-0.11) n=3
CRM 2.0 10% GLC No.: 8891	**22.9** (22.5-23.7) n=101	**7.75** (7.49-8.06) n=47	**4.4** (2.4-7.8) n=95	**299** (278-317) n=23	**117** (110-124) n=2	**134** (128-140) n=2	**0.39** (0.00-0.72) n=3
CRM 2.0 20% GLC No.: 8891	**22.9** (22.4-23.7) n=106	**7.76** (7.48-8.13) n=50	**4.3** (2.3-6.7) n=100	**301** (281-316) n=22	**118** (112-124) n=2	**140** (136-144) n=2	**0.18** (0.0-0.54) n=3
CRM 2.0 40% GLC No.: 8891	**22.9** (22.4-23.7) n=100	**7.76** (7.53-8.06) n=46	**4.4** (3.0-6.7) n=94	**298** (270-320) n=22	**117** (110-124) n=2	**132** (128-136) n=2	**0.12** (0.0-0.36) n=3
CRM 2.0 60% GLC No.: 8891	**22.9** (22.5-23.6) n=98	**7.72** (7.45-8.01) n=46	**4.2** (2.4-6.3) n=92	**297** (277-313) n=22	**116** (112-120) n=2	**140** (140-140) n=2	**0.08J** (0.0-0.24) n=3
CRM 2.0 80% GLC No.: 8891	**22.8** (22.0-23.6) n=103	**7.71** (7.54-7.98) n=49	**4.2** (2.0-6.5) n=97	**294** (277-314) n=23	**114** (110-118) n=2	**136** (132-140) n=2	**0.08J** (0.0-0.19) n=3
CRM 2.0 100% GLC No.: 8891	**22.8** (22.0-23.4) n=96	**7.71** (7.48-7.92) n=44	**4.4** (2.6-6.6) n=90	**292** (274-306) n=20	**113** (110-116) n=2	**138** (132-144) n=2	**0.05J** (0.00-0.14) n=3

J = Between MDL (0.04) and RL (0.1)

TABLE 25. **Summary of Mean Water Quality Parameters for Sediments CRM 3.0 and CRM 4.0 of Test Exposure Water Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Clinch River *Chironomus dilutus* Partial Life-Cycle Whole Sediment Toxicity Tests Conducted March 24- May 14, 2011.**

Sample ID GLC No.	**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)
CRM 3.0 10% GLC No.: 8893	**22.9** (22.0-23.7) n=98	**7.80** (7.57-8.14) n=45	**4.5** (2.5-6.7) n=92	**304** (276-333) n=22	**119** (110-128) n=2	**140** (140-140) n=2	**0.21** (0.01-0.60) n=3
CRM 3.0 20% GLC No.: 8893	**22.9** (22.0-23.6) n=102	**7.81** (7.57-8.14) n=48	**4.2** (2.3-7.0) n=96	**303** (280-327) n=22	**120** (110-130) n=2	**138** (136-140) n=2	**0.26** (0.02-0.64) n=3
CRM 3.0 40% GLC No.: 8893	**22.9** (22.0-23.6) n=96	**7.81** (7.59-8.21) n=44	**4.2** (2.0-6.7) n=90	**306** (278-328) n=20	**120** (90-150) n=2	**138** (124-152) n=2	**0.21** (0.01-0.61) n=3
CRM 3.0 60% GLC No.: 8893	**22.9** (22.1-23.7) n=98	**7.81** (7.63-8.17) n=46	**4.0** (2.1-6.7) n=92	**304** (277-334) n=22	**121** (108-134) n=2	**142** (132-152) n=2	**0.22** (0.01-0.58) n=3
CRM 3.0 80% GLC No.: 8893	**22.9** (22.1-23.6) n=100	**7.78** (7.52-8.06) n=46	**3.8** (2.0-6.5) n=94	**307** (277-339) n=22	**129** (112-138) n=3	**144** (132-152) n=3	**0.39** (0.02-0.70) n=4
CRM 3.0 100% GLC No.: 8893	**22.9** (22.1-23.6) n=102	**7.71** (7.49-8.15) n=48	**3.7** (1.8-6.0) n=96	**305** (273-339) n=22	**125** (108-142) n=2	**144** (128-160) n=2	**0.26** (0.01-0.72) n=3
CRM 4.0 10% GLC No.: 8895	**23.2** (22.6-23.7) n=104	**7.73** (7.44-8.03) n=48	**4.5** (2.2-6.7) n=98	**300** (279-317) n=22	**116** (112-120) n=2	**142** (132-152) n=2	**0.23** (0.0-0.64) n=3
CRM 4.0 20% GLC No.: 8895	**23.2** (22.7-23.7) n=104	**7.76** (7.46-8.07) n=48	**4.4** (2.3-6.4) n=98	**300** (278-319) n=22	**112** (110-114) n=3	**143** (132-148) n=3	**0.17** (0.00-0.38) n=4
CRM 4.0 40% GLC No.: 8895	**23.3** (22.8-23.7) n=96	**7.74** (7.50-8.06) n=42	**4.3** (2.0-6.7) n=90	**302** (279-316) n=20	**113** (110-116) n=2	**146** (140-152) n=2	**0.17** (0.02-0.30) n=3
CRM 4.0 60% GLC No.: 8895	**23.3** (22.8-23.7) n=96	**7.75** (7.51-8.06) n=42	**4.3** (1.1-6.3) n=90	**301** (276-319) n=20	**114** (110-118) n=2	**148** (140-156) n=2	**0.10** (0.01-0.24) n=3
CRM 4.0 80% GLC No.: 8895	**23.2** (22.4-23.7) n=102	**7.71** (7.45-8.06) n=46	**4.1** (1.6-6.4) n=96	**297** (278-319) n=22	**114** (110-118) n=2	**138** (132-144) n=2	**0.08J** (0.02-0.19) n=3
CRM 4.0 100% GLC No.: 8895	**23.2** (21.9-23.7) n=100	**7.73** (7.48-7.98) n=44	**4.3** (1.6-6.3) n=94	**296** (274-319) n=22	**110** (108-112) n=2	**138** (136-140) n=2	**.05J** (0.0-0.14) n=3

J = Between MDL (0.04) and RL (0.1)

TABLE 26. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 1.5 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 March 22-April 19, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**	**CRM 1.5-10%**	**CRM 1.5-20%**	**CRM 1.5-40%**	**CRM 1.5-60%**	**CRM 1.5-80%**	**CRM 1.5-100%**
	LCS+CRW	**CRS + CRW GLC# 8897**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**	**GLC# 8889**
1	10	9	10	10	10	10	8	8
2	10	8	8	8	10	10	8	9
3	9	10	8	8	8	10	8	9
4	8	10	10	9	10	10	8	9
5	9	9	10	10	7	10	9	9
6	9	10	10	7	8	8	9	9
7	10	9	10	9	10	7	8	9
8	10	8	10	10	9	7	8	10
28-Day Percent Survival	**93.8**	**91.3**	**95.0**	**88.8**	**90.0**	**90.0**	**82.5**	**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 Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 1.5 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 March 22-April 19, 2011.**

REPLICATE #	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 1.5-10%		CRM 1.5-20%		CRM 1.5-40%		CRM 1.5-60%		CRM 1.5-80%		CRM 1.5-100%	
	LCS+CRW		CRS + CRW GLC# 8897		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889		GLC# 8889	
	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	0.44700	0.44700	0.35222	0.31700	0.23400	0.23400	0.28700	0.28700	0.25900	0.25900	0.28500	0.28500	0.31000	0.24800	0.22625	0.18100
2	0.35200	0.35200	0.35000	0.28000	0.29375	0.23500	0.32000	0.25600	0.21600	0.21600	0.22900	0.22900	0.23000	0.18400	0.25444	0.22900
3	0.46889	0.42200	0.31400	0.31400	0.21625	0.17300	0.35250	0.28200	0.28250	0.22600	0.22000	0.22000	0.21125	0.16900	0.21333	0.19200
4	0.41250	0.33000	0.24300	0.24300	0.25000	0.25000	0.28556	0.25700	0.22100	0.22100	0.25300	0.25300	0.24875	0.19900	0.24111	0.21700
5	0.48778	0.43900	0.32333	0.29100	0.24500	0.24500	0.29700	0.29700	0.30857	0.21600	0.25800	0.25800	0.23444	0.21100	0.21222	0.19100
6	0.42111	0.37900	0.30300	0.30300	0.24700	0.24700	0.34429	0.24100	0.27000	0.21600	0.31875	0.25500	0.25778	0.23200	0.25556	0.23000
7	0.45300	0.45300	0.25667	0.23100	0.29300	0.29300	0.33667	0.30300	0.21500	0.21500	0.25429	0.17800	0.21500	0.17200	0.23556	0.21200
8	0.38900	0.38900	0.50625	0.40500	0.34600	0.34600	0.23500	0.23500	0.24667	0.22200	0.21143	0.14800	0.16125	0.12900	0.20300	0.20300
Average[1] Dry Weight (mg)	**0.42891**		**0.33106**		**0.26563[a]**		**0.30725**		**0.25234[a]**		**0.25368[a]**		**0.23356[a]**		**0.23018[a]**	
Average Biomass[2] Weight (mg)		**0.40138**		**0.29800**		**0.25288**		**0.26975**		**0.22388[a]**		**0.22825[a]**		**0.19300[a]**		**0.20688[a]**
28-Day Percent Survival	**93.8**		**91.3**		**95.0**		**88.8**		**90.0**		**90.0**		**82.5**		**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 Clinch River Reference Control Sediment (GLC# 8897)

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01850 mg

TABLE 28. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 2.5 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 March 22-April 19, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**	**CRM 2.5-10%**	**CRM 2.5-20%**	**CRM 2.5-40%**	**CRM 2.5-60%**	**CRM 2.5-80%**	**CRM 2.5-100%**
	LCS+CRW	**CRS + CRW GLC# 8897**	**GLC# 8892**	**GLC# 8892**	**GLC# 8892**	**GLC# 8892**	**GLC# 8892**	**GLC# 8892**
1	10	9	9	10	10	10	9	10
2	10	8	8	10	10	9	10	10
3	9	10	10	10	9	10	10	8
4	8	10	10	8	10	10	10	10
5	9	9	10	9	8	9	10	10
6	9	10	10	10	10	9	10	9
7	10	9	10	10	10	10	10	10
8	10	8	10	10	10	10	10	9
28-Day Percent Survival	**93.8**	**91.3**	**96.3**	**96.3**	**96.3**	**96.3**	**98.8**	**95.0**

[r] Replicates initiated with 10 organisms each

TABLE 29. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 2.5 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 March 22-April 19, 2011.**

REPLICATE #	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 2.5-10%		CRM 2.5-20%		CRM 2.5-40%		CRM 2.5-60%		CRM 2.5-80%		CRM 2.5-100%	
	LCS+CRW		CRS + CRW GLC# 8897		GLC# 8892		GLC# 8892		GLC# 8892		GLC# 8892		GLC# 8892		GLC# 8892	
	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	0.44700	0.44700	0.35222	0.31700	0.31778	0.28600	0.32800	0.32800	0.27000	0.27000	0.24800	0.24800	0.30222	0.27200	0.31000	0.31000
2	0.35200	0.35200	0.35000	0.28000	0.30875	0.24700	0.32300	0.32300	0.19500	0.19500	0.28333	0.25500	0.19300	0.19300	0.27300	0.27300
3	0.46889	0.42200	0.31400	0.31400	0.33700	0.33700	0.36900	0.36900	0.33778	0.30400	0.20100	0.20100	0.23700	0.23700	0.31125	0.24900
4	0.41250	0.33000	0.24300	0.24300	0.29200	0.29200	0.35875	0.28700	0.24400	0.24400	0.21300	0.21300	0.21300	0.21300	0.22900	0.22900
5	0.48778	0.43900	0.32333	0.29100	0.39900	0.39900	0.30667	0.27600	0.28500	0.22800	0.32778	0.29500	0.25700	0.25700	0.26400	0.26400
6	0.42111	0.37900	0.30300	0.30300	0.26400	0.26400	0.28200	0.28200	0.28600	0.28600	0.29222	0.26300	0.29900	0.29900	0.24111	0.21700
7	0.45300	0.45300	0.25667	0.23100	0.27200	0.27200	0.38300	0.38300	0.27500	0.27500	0.25000	0.25000	0.25100	0.25100	0.26300	0.26300
8	0.38900	0.38900	0.50625	0.40500	0.42000	0.42000	0.45300	0.45300	0.33200	0.33200	0.25100	0.25100	0.21000	0.21000	0.26778	0.24100
Average[1] Dry Weight (mg)	**0.42891**		**0.33106**		**0.32632**		**0.35043**		**0.27810**		**0.25829**[a]		**0.24528**[a]		**0.26989**	
Average Biomass[2] Weight (mg)		**0.40138**		**0.29800**		**0.31463**		**0.33763**		**0.26675**		**0.24700**		**0.24150**[a]		**0.25575**
28-Day Percent Survival	**93.8**		**91.3**		**96.3**		**96.3**		**96.3**		**96.3**		**98.8**		**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

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01850 mg

TABLE 30. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 3.0 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 March 22-April 19, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**	**CRM 3.0-10%**	**CRM 3.0-20%**	**CRM 3.0-40%**	**CRM 3.0-60%**	**CRM 3.0-80%**	**CRM 3.0-100%**
	LCS+CRW	**CRS + CRW GLC# 8897**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**	**GLC# 8893**
1	10	9	9	10	10	10	9	10
2	10	8	10	10	10	10	8	10
3	9	10	10	10	10	10	10	10
4	8	10	10	10	10	10	10	10
5	9	9	10	8	10	10	10	9
6	9	10	10	10	10	9	10	10
7	10	9	10	10	10	10	8	9
8	10	8	10	10	10	5	10	10
28-Day Percent Survival	**93.8**	**91.3**	**98.8**	**97.5**	**100.0**	**92.5**	**93.8**	**97.5**

[r] Replicates initiated with 10 organisms each

TABLE 31. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 3.0 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 March 22-April 19, 2011.**

REPLICATE #	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 3.0-10%		CRM 3.0-20%		CRM 3.0-40%		CRM 3.0-60%		CRM 3.0-80%		CRM 3.0-100%	
	LCS+CRW		CRS + CRW GLC# 8897		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893		GLC# 8893	
	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	0.44700	0.44700	0.35222	0.31700	0.31222	0.28100	0.20900	0.20900	0.42500	0.42500	0.33800	0.33800	0.33556	0.30200	0.21800	0.21800
2	0.35200	0.35200	0.35000	0.28000	0.25400	0.25400	0.25400	0.25400	0.50500	0.50500	0.24700	0.24700	0.33250	0.26600	0.22600	0.22600
3	0.46889	0.42200	0.31400	0.31400	0.29700	0.29700	0.39900	0.39900	0.36600	0.36600	0.27800	0.27800	0.25400	0.25400	0.27700	0.27700
4	0.41250	0.33000	0.24300	0.24300	0.16800	0.16800	0.20900	0.20900	0.37600	0.37600	0.24300	0.24300	0.28200	0.28200	0.29500	0.29500
5	0.48778	0.43900	0.32333	0.29100	0.32600	0.32600	0.33875	0.27100	0.39700	0.39700	0.29800	0.29800	0.29400	0.29400	0.31778	0.28600
6	0.42111	0.37900	0.30300	0.30300	0.23900	0.23900	0.26300	0.26300	0.32200	0.32200	0.31778	0.28600	0.24000	0.24000	0.23800	0.23800
7	0.45300	0.45300	0.25667	0.23100	0.46100	0.46100	0.33400	0.33400	0.34700	0.34700	0.34000	0.34000	0.32625	0.26100	0.30111	0.27100
8	0.38900	0.38900	0.50625	0.40500	0.34700	0.34700	0.31100	0.31100	0.28200	0.28200	0.42400	0.21200	0.23100	0.23100	0.27700	0.27700
Average[1] Dry Weight (mg)	**0.42891**		**0.33106**		**0.30053**		**0.28972**		**0.37750**		**0.31072**		**0.28691**		**0.26874**	
Average Biomass[2] Weight (mg)		**0.40138**		**0.29800**		**0.29663**		**0.28125**		**0.37750**		**0.28025**		**0.26625**		**0.26100**
28-Day Percent Survival	**93.8**		**91.3**		**98.8**		**97.5**		**100.0**		**92.5**		**93.8**		**97.5**	

[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

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01850 mg

TABLE 32. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 4.5 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 March 22-April 19, 2011.

	Number Test Organisms Surviving per Replicate[r]							
Replicate Number	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**	**CRM 4.5-10%**	**CRM 4.5-20%**	**CRM 4.5-40%**	**CRM 4.5-60%**	**CRM 4.5-80%**	**CRM 4.5-100%**
	LCS+CRW	**CRS + CRW GLC# 8897**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**	**GLC# 8896**
1	10	9	9	9	9	10	10	10
2	10	8	10	10	8	10	10	10
3	9	10	10	10	10	10	6	10
4	8	10	10	9	10	10	9	10
5	9	9	10	10	10	10	10	10
6	9	10	10	10	10	9	10	9
7	10	9	10	10	10	10	9	9
8	10	8	10	10	4	10	9	10
28-Day Percent Survival	**93.8**	**91.3**	**98.8**	**97.5**	**88.8**	**98.8**	**91.3**	**97.5**

[r] Replicates initiated with 10 organisms each

TABLE 33. **Comparison of Average[1] Dry Weight (mg), Biomass[2] (mg) and Percent Survival Between the Clinch River Reference Control Sediment Sample and Investigative Sediment Sample CRM 4.5 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 March 22-April 19, 2011.**

REPLICATE #	Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control		CRM 4.5-10%		CRM 4.5-20%		CRM 4.5-40%		CRM 4.5-60%		CRM 4.5-80%		CRM 4.5-100%	
	LCS+CRW		CRS + CRW GLC# 8897		GLC# 8896		GLC# 8896		GLC# 8896		GLC# 8896		GLC# 8896		GLC# 8896	
	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	0.44700	0.44700	0.35222	0.31700	0.33889	0.30500	0.38667	0.34800	0.34556	0.31100	0.26600	0.26600	0.22100	0.22100	0.20600	0.20600
2	0.35200	0.35200	0.35000	0.28000	0.21000	0.21000	0.27600	0.27600	0.22125	0.17700	0.43300	0.43300	0.19700	0.19700	0.23100	0.23100
3	0.46889	0.42200	0.31400	0.31400	0.49600	0.49600	0.28900	0.28900	0.28200	0.28200	0.27000	0.27000	0.16834	0.10100	0.21300	0.21300
4	0.41250	0.33000	0.24300	0.24300	0.26200	0.26200	0.35889	0.32300	0.22625	0.22625	0.23000	0.23000	0.19556	0.17600	0.19800	0.19800
5	0.48778	0.43900	0.32333	0.29100	0.42600	0.42600	0.39500	0.39500	0.22800	0.22800	0.25000	0.25000	0.23900	0.23900	0.15200	0.15200
6	0.42111	0.37900	0.30300	0.30300	0.27900	0.27900	0.37900	0.37900	0.26400	0.26400	0.21445	0.19300	0.24100	0.24100	0.20333	0.18300
7	0.45300	0.45300	0.25667	0.23100	0.16500	0.16500	0.31800	0.31800	0.24300	0.24300	0.27700	0.27700	0.22889	0.20600	0.20444	0.18400
8	0.38900	0.38900	0.50625	0.40500	0.45200	0.45200	0.22300	0.22300	0.28000	0.11200	0.27000	0.27000	0.21333	0.19200	0.26300	0.26300
Average[1] Dry Weight (mg)	**0.42891**		**0.33106**		**0.32861**		**0.32820**		**0.26126**		**0.27631**		**0.21302** [a]		**0.20885** [a]	
Average Biomass[2] Weight (mg)		**0.40138**		**0.29800**		**0.32438**		**0.31888**		**0.23041**		**0.27363**		**0.19663** [a]		**0.20375** [a]
28-Day Percent Survival	**93.8**		**91.3**		**98.8**		**97.5**		**88.8**		**98.8**		**91.3**		**97.5**	

[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 Clinch River Reference Control Sediment (GLC# 8897)

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01850 mg

TABLE 34. Comparison of the Number of Surviving Organisms per Replicate and Percent Survival Between the Laboratory Control Sediment with Laboratory Control water, the Water Only Control, and between the Laboratory Control Sediment with Laboratory Control water and the Laboratory Control Sediment with Clinch River Water (CRM 7.0) for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted March 22-April 19, 2011.

	Number Test Organisms Surviving per Replicate[r]			
Replicate Number	**Laboratory Control with Laboratory Water**	**Water Only Control**	**Laboratory Control with Clinch River Water CRM 7.0**	**Clinch River Reference Control**
	LCS+GLW	**GLW**	**LCS + CRW**	**CRS + CRW GLC# 8897**
1	10	8	10	9
2	10	9	10	8
3	10	10	9	10
4	10	10	8	10
5	10	10	9	9
6	10	10	9	10
7	10	10	10	9
8	10	10	10	8
28-Day Percent Survival	**100.0**	**96.3**	**93.8**	**91.3**

[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 Control water, the Water Only Control, and between the Laboratory Control Sediment with Laboratory Control water and the Laboratory Control Sediment with Clinch River Water (CRM 7.0) for the Tennessee Valley Authority (TVA) *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted March 22-April 19, 2011.**

REPLICATE #	Laboratory Control with Laboratory Water		Water Only Control		Laboratory Control with Clinch River Water CRM 7.0		Clinch River Reference Control	
	LCS+GLW		GLW		LCS + CRW		CRS + CRW GLC# 8897	
	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	0.41600	0.41600	0.15375	0.12300	0.44700	0.44700	0.35222	0.31700
2	0.41600	0.41600	0.23333	0.21000	0.35200	0.35200	0.35000	0.28000
3	0.48300	0.48300	0.22100	0.22100	0.46889	0.42200	0.31400	0.31400
4	0.47100	0.47100	0.32700	0.32700	0.41250	0.33000	0.24300	0.24300
5	0.58500	0.58500	0.26100	0.26100	0.48778	0.43900	0.32333	0.29100
6	0.40200	0.40200	0.21600	0.21600	0.42111	0.37900	0.30300	0.30300
7	0.41300	0.41300	0.23800	0.23800	0.45300	0.45300	0.25667	0.23100
8	0.36000	0.36000	0.27300	0.27300	0.38900	0.38900	0.50625	0.40500
Average[1] Dry Weight (mg)	**0.44325**		**0.24039** [b]		**0.42891**		**0.33106** [c]	
Average Biomass[2] Weight (mg)		**0.44325**		**0.23363** [b]		**0.40138**		**0.29800** [c]
28-Day Percent Survival	**100.0**		**96.3**		**93.8**		**91.3**	

[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 Clinch River Water CRM 7.0

Note: Average Dry Weight of Hyalella azteca at test initiation = 0.01850 mg

TABLE 36. **Summary Estimates of the No-Observed-Effect-Concentration (NOEC), Lowest-Observed-Effect-Concentration (LOEC), and IC_{25} for Survival, Average Growth and Biomass for the Clinch River Reference Control Sediment Sample and the Investigative Sediment Samples CRM 1.5, CRM 2.5, CRM 3.0, and CRM 4.5 (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 March 22-April 19, 2011.**

Sample ID	Survival (percent sediment)				Growth (percent sediment)				Biomass (percent sediment)		
GLC Number	NOEC	LOEC	IC_{25}		NOEC	LOEC	IC_{25}		NOEC	LOEC	IC_{25}
CRM 1.5	100	>100	>100		20	40	64.9		20	40	62.0
GLC #8889											
CRM 2.5	100	>100	>100		100	>100	>100		100	>100	>100
GLC #8892											
CRM 3.0	100	>100	>100		100	>100	>100		100	>100	>100
GLC #8893											
CRM 4.5	100	>100	>100		60	80	67.3		60	80	66.4
GLC #8896											

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) Clinch River *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted March 22- April 19, 2011.**

Sample ID GLC No.	**Temperature (°C)** (range) n=58	**pH (s.u.)** (range) n=28	**Dissolved Oxygen (mg/L)** (range) n=40	**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
Clinch River Reference Control GLC No.: 8897	**22.7** (22.1-23.2)	**7.89** (7.25-8.17)	**6.4** (4.5-7.5)	**311** (304-321)	**125** (122-128)	**132** (120-144)	**0.55** (0.17-0.92)
LCS & CRW Laboratory Control Sediment with Clinch River Water-CRM 7.0	**22.7** (22.3-23.4)	**7.78** (7.33-7.97)	**5.7** (4.6-8.0)	**316** (306-331)	**129** (124-134)	**142** (136-148)	**0.38** (0.00-0.75)
LCS & GLW Laboratory Control Sediment with Laboratory Water	**22.7** (22.1-23.1)	**7.71** (7.11-8.14)	**5.5** (3.8-6.7)	**317** (308-333)	**120** (110-130)	**142** (132-152)	**0.50** (0.00-0.99)
GLW Laboratory Water Only	**22.7** (22.2-23.1)	**7.95** (7.70-8.15)	**7.5** (6.3-8.2)	**300** (298-306)	**103** (102-104)	**132** (128-136)	**0.01 U** (0.00-0.01)

U = Below MDL (0.04) (non detect)

TABLE 38. **Summary of Mean Water Quality Parameters of Overlying Water Samples for test sediments CRM 1.5 and CRM 2.5 Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Clinch River *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted March 22- April 19, 2011.**

Sample ID GLC No.	**Temperature (°C)** (range) n=58	**pH (s.u.)** (range) n=28	**Dissolved Oxygen (mg/L)** (range) n=40 n=38; CRM 1.5 100%	**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
CRM 1.5 10% GLC No.: 8889	**22.7** (22.3-23.3)	**8.02** (7.57-8.37)	**6.5** (5.7-7.4)	**317** (302-326)	**127** (126-128)	**146** (144-148)	**0.36** (0.00-0.71)
CRM 1.5 20% GLC No.: 8889	**22.7** (22.3-23.3)	**8.04** (7.64-8.34)	**6.4** (5.6-7.3)	**315** (305-326)	**124** (124-124)	**138** (136-140)	**0.32** (0.00-0.63)
CRM 1.5 40% GLC No.: 8889	**22.7** (22.3-23.5)	**8.02** (7.54-8.27)	**6.5** (5.8-7.2)	**313** (305-330)	**123** (122-124)	**138** (136-140)	**0.23** (0.00-0.45)
CRM 1.5 60% GLC No.: 8889	**22.7** (22.3-23.5)	**7.98** (7.62-8.23)	**6.5** (5.5-7.2)	**309** (300-321)	**118** (114-122)	**142** (132-152)	**0.18** (0.00-0.35)
CRM 1.5 80% GLC No.: 8889	**22.7** (22.3-23.5)	**7.94** (7.60-8.18)	**6.4** (5.4-7.6)	**305** (295-319)	**119** (116-122)	**134** (132-136)	**0.12** (0.00-0.23)
CRM 1.5 100% GLC No.: 8889	**22.7** (22.3-23.5)	**7.92** (7.54-8.14)	**6.5** (5.6-7.7)	**303** (293-314)	**115** (112-118)	**140** (140-140)	**0.09 J** (0.00-0.18)
CRM 2.5 10% GLC No.: 8892	**22.7** (22.3-23.5)	**8.03** (7.58-8.30)	**6.4** (5.5-7.5)	**317** (303-327)	**127** (126-128)	**140** (136-144)	**0.35** (0.00-0.70)
CRM 2.5 20% GLC No.: 8892	**22.7** (22.3-23.5)	**8.07** (7.62-8.38)	**6.4** (5.6-7.4)	**316** (303-326)	**128** (126-130)	**150** (148-152)	**0.35** (0.00-0.70)
CRM 2.5 40% GLC No.: 8892	**22.7** (22.4-23.5)	**8.04** (7.66-8.32)	**6.4** (5.5-7.5)	**313** (303-325)	**123** (122-124)	**138** (136-140)	**0.34** (0.00-0.67)
CRM 2.5 60% GLC No.: 8892	**22.7** (22.3-23.5)	**8.00** (7.61-8.31)	**6.4** (5.1-7.5)	**311** (300-325)	**121** (120-122)	**142** (140-144)	**0.23** (0.00-0.46)
CRM 2.5 80% GLC No.: 8892	**22.7** (22.3-23.5)	**7.99** (7.61-8.24)	**6.4** (5.6-7.5)	**309** (299-325)	**120** (120-120)	**148** (140-156)	**0.16** (0.00-0.32)
CRM 2.5 100% GLC No.: 8892	**22.6** (22.2-23.5)	**7.94** (7.60-8.18)	**6.2** (5.4-7.2)	**306** (295-323)	**122** (120-124)	**124** (120-128)	**0.12** (0.00-0.24)

J = Between MDL (0.04) and RL (0.1)

TABLE 39. **Summary of Mean Water Quality Parameters of Overlying Water Samples for test sediments CRM 3.0 and CRM 4.5 Collected Prior to Renewal for the Tennessee Valley Authority (TVA) Clinch River *Hyalella azteca* 28-Day Whole Sediment Toxicity Tests Conducted March 22- April 19, 2011.**

Sample ID GLC No.	**Temperature (°C)** (range) n=58	**pH (s.u.)** (range) n=28	**Dissolved Oxygen (mg/L)** (range) n=40	**Specific Conductivity (µmhos/cm)** (range) n=12 n=11; CRM 4.5 10%	**Alkalinity (CaCO3 mg/L)** (range) n=2 n=3; CRM 4.5 20%	**Hardness (CaCO3 mg/L)** (range) n=2 n=3; CRM 4.5 20%	**Ammonia (mg/L as N)** (range) n=2 n=3; CRM 4.5 20%
CRM 3.0 10% GLC No.: 8893	**22.7** (22.1-23.1)	**8.04** (7.65-8.47)	**6.6** (5.9-7.7)	**317** (302-328)	**125** (122-128)	**146** (140-152)	**0.36** (0.00-0.72)
CRM 3.0 20% GLC No.: 8893	**22.7** (22.1-23.2)	**8.08** (7.65-8.45)	**6.7** (5.7-7.8)	**320** (305-335)	**126** (122-130)	**144** (136-152)	**0.45** (0.00-0.89)
CRM 3.0 40% GLC No.: 8893	**22.7** (22.1-23.1)	**8.06** (7.65-8.46)	**6.5** (5.6-7.5)	**320** (305-335)	**126** (120-132)	**144** (132-156)	**0.38** (0.00-0.76)
CRM 3.0 60% GLC No.: 8893	**22.7** (22.2-23.1)	**8.07** (7.65-8.53)	**6.4** (5.3-7.4)	**322** (302-355)	**130** (122-138)	**146** (136-156)	**0.40** (0.00-0.79)
CRM 3.0 80% GLC No.: 8893	**22.7** (22.2-23.2)	**8.07** (7.65-8.51)	**6.2** (4.7-7.2)	**322** (300-343)	**133** (124-142)	**144** (132-156)	**0.40** (0.00-0.79)
CRM 3.0 100% GLC No.: 8893	**22.7** (22.2-23.2)	**8.09** (7.67-8.54)	**6.0** (5.1-7.5)	**322** (298-341)	**133** (126-140)	**140** (128-152)	**0.38** (0.00-0.76)
CRM 4.5 10% GLC No.: 8896	**22.7** (22.2-23.1)	**8.01** (7.38-8.42)	**6.7** (5.8-7.6)	**315** (303-325)	**127** (124-130)	**144** (140-148)	**0.34** (0.00-0.67)
CRM 4.5 20% GLC No.: 8896	**22.7** (22.2-23.1)	**8.02** (7.53-8.27)	**6.7** (5.8-7.4)	**314** (304-323)	**121** (116-128)	**147** (140-152)	**0.21** (0.00-0.63)
CRM 4.5 40% GLC No.: 8896	**22.7** (22.1-23.1)	**7.98** (7.58-8.15)	**6.7** (5.6-7.6)	**311** (305-319)	**121** (118-124)	**144** (144-144)	**0.24** (0.00-0.47)
CRM 4.5 60% GLC No.: 8896	**22.7** (22.1-23.1)	**7.95** (7.60-8.17)	**6.7** (5.9-7.4)	**309** (301-316)	**120** (118-122)	**146** (144-148)	**0.16** (0.00-0.32)
CRM 4.5 80% GLC No.: 8896	**22.7** (22.2-23.1)	**7.91** (7.57-8.15)	**6.7** (5.9-7.7)	**308** (297-318)	**116** (114-118)	**148** (140-156)	**0.09 J** (0.00-0.18)
CRM 4.5 100% GLC No.: 8896	**22.7** (22.2-23.1)	**7.92** (7.60-8.10)	**6.7** (5.9-7.4)	**308** (296-326)	**116** (114-118)	**148** (148-148)	**0.04 J** (0.00-0.07)

J = Between MDL (0.04) and RL (0.1)

TABLE 40. **Summary of Mean Water Quality Parameters of Waters; CRM 7.0 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) Clinch River Whole Sediment Toxicity Tests Conducted March 22-May 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
Clinch River Water-CRM 7.0	**22.8** (21.9-24.0)	**8.17** (7.62-8.47)	**8.3** (6.6-10.9)	**288** (238-313)	**112** (96-124)	**134** (112-152)	**0.03 U** (0.0-0.18)
GLW GLEC Laboratory Water	**23.0** (21.9-24.0)	**8.08** (7.02-8.48)	**8.1** (5.6-9.0)	**297** (270-326)	**104** (102-106)	**136** (128-140)	**0.26** (0.00-0.26)
	n=108	n=47	n=109	n=45	n=6	n=6	n=7

U = Below MDL (0.04) (non detect)

Appendix A
Chain of Custodies

RECORD COPY

CHAIN OF CUSTODY RECORD

COC No. BULKSW-031611-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 03/16/2011

Location: CRM7.0

Collected By: C.L. Jackson (TVA), R. Josefczyk (RSI)
M. Greer (RSI) T. Walls (RSI) E.M. Ickey (RSI)
R. Vance (RSI) G. Frye (RSI) E. Arnold (RSI) A. Johnson (RSI)
D. Mathis (RSI)

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

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

General Comments:

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

Batch C TVA-KIF-NTC-TOX-003

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) GLEC#				
	---	Date	Time	---	---	Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-CRM7.0-GLEC-031611	G	03/16/2011	1133	(160) 10L cubitainers	9.74	NA	NA	✓	NA	8911	3.4-5.8 see TVA log book	[illegible]	0847	Good all seals intact
KY031611														

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk / RSI	031711 / 0800	[illegible] RSI	031711 / 0800
[illegible] RSI	031711 / 1504	[illegible] / GLEC	3/18/2011 0847

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011967 ✓ [illegible]

all custody seals intact
BOL# 25778022

COURIER TRANSPORT DOCUMENTATION

DATE: 03/17/10

COURIER COMPANY:

FedEx

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	80 "milk crates" containing 2-2.5 gallon cubitainers each.

Shippers Name/Company: David Mathis / RSI

Date / Time: 031711 / 1511

Courier Signature/Company: Jean Brothers FedEx CC

Date / Time: 031711 / 1511

Receipt Signature/Company: Mailu W Hart / GLEC

Date / Time: 3/18/2011 :0847

Corresponding Chains of Custody: Bill Lading: 25778022 Padlock 0011967

BULKSW-031611-GLEC Page 1 of 1	

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Page _____ of _____

Shipper, mark all copies clearly and sign.

Shipper Tracking #	Authorization #	Purchase Order #	Carrier PRO/BOL #
2 BOL			25778022

① Shipper (from)

Name Tennessee Vally Authority

Address 189 Lakeshore DR

City Harriman State or Province TN

Country ____ Zip 37748 Phone(____) _____

Attn Jason Brown

② Consignee (to)

Name Great Lakes Environmental Center

Address 739 Hastings ST

City Traverse City State or Province MI

Country ____ Zip 49686 Phone(____) _____

Attn _____

③ Freight charges are: ❑ Prepaid ❑ Collect ☒ Third Party Bill freight charges to:

Name _____ Address _____

P.O. Box _____ City _____ State _____ Zip _____

④ **C.O.D.** Collect on Delivery $_____

Remit C.O.D. to:

Name _____ Phone _____

Street _____

City _____ State _____ Zip _____

⑤ # Handling Units: Pieces	Container Type	HM (X)	Description of Articles, Kind of Packaging, Dimensions, Special Marks, Exceptions and Unit Measurements, (i.e., pounds, gallons, etc.) Shipper ▸ Mark HM column for hazardous materials.	Weight in lbs. (Subject to correction)
80	Crates		Water samples	~~7500~~ 7000
			Seal# 0011967 DM 031711	
			Temp: 33°-43°F DM 031711	

⑥ **Hazmat Certification** - 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.

Emergency Response Phone Number	Shipper Name (signature)	Legible Authorized Name (print)

⑦ If this shipment is to be delivered to the consignee without recourse on the shipper, the shipper shall sign the following statement. The carrier may decline to make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Shipper Signature)

⑧ **Tariff Terms and Conditions; Charges** - Absent a contractual agreement, all terms and conditions for transportation services (including charges) shall be set forth in Carrier's tariff as maintained at Carrier's Corporate Headquarters and in effect on the date service is provided. Copies available upon request or at **customcritical.fedex.com.**

Delay - There is always a risk of late delivery or non-delivery. In the event of a late delivery, at your request within 30 days of shipment, FedEx Custom Critical may under certain conditions refund part of transportation charges paid.

⑨ **Consequential Damages** - Carrier is not responsible or liable for any loss or damage resulting from delay, non-delivery or damage to shipment except as noted below. This includes loss of sales, income, interest, profits, attorneys fees and other costs, but is not limited to these items. Such damages are called "consequential damages."

Limitation of Liability/Declared Value Damage or Loss - We are liable for no more than $50,000 per shipment in the event of physical loss or damage to cargo, unless you fill in a higher *Declared Value*, document higher actual loss in the event of a claim and pay an additional fee subject to Service Guide Tariff FDCC 101 provisions for declared value. ***Special conditions apply to Used and Refurbished Equipment, documents, data, data records and Rescued/Interlined shipments. *See reverse side for additional valuation terms and conditions. Complete terms and conditions appear in prevailing Service Guide Tariff FDCC 101 available at www.customcritical.fedex.com***

Shipper must state specifically in the space below the agreed or declared value of the property as follows: Shipper hereby states that the agreed or declared value of the property is:

$_____

⑩ Loaded by: ☒ Shipper ❑ Driver ❑ Shipper Load & Count Comments:

❑ Requested cargo hold temp _____° to _____° ❑ Seal number _____

❑ _____ Pallets/Container said to contain _____ pieces ❑ Shrink wrap

❑ Condition of freight unknown due to: _____

⑪ **Shipper's Record**

Date Mar 17, '11 Shipper Signature _____ Trailer # _____

Date Mar 17, '11 Driver Signature Jean Brothers Truck # DR4501

Arrived _____ ❑ a.m. 14:45 ☒ p.m.

Departed _____ ❑ a.m. _____ ❑ p.m.

Delivery Record ***(Please print and sign full name)***

Received shipment described above in good order and condition except as noted. ☒ Seal Intact ☒ Consignee Unload

Signature: Mailee W. Garton

Print: Mailee W. Garton

Date: Mar 18, '11

Arrived _____ ☒ a.m. _____ ❑ p.m.

Departed _____ ❑ a.m. _____ ❑ p.m.

Comments: _____

FIN_001_039

Shipment terms and conditions are established on this FedEx Custom Critical Bill of Lading.

Consignee copy

Great Lakes Environmental Center

Sample CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	3/18/11			Nuk	
SAMPLE ID	BUKSW-CRM7.0-GLEC-031611				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8911				
COLLECTION DATE (Time Interval)	3/16/2011 1133				
TEMPERATURE (≤6 degrees Celsius[1])	See TVA Book 3.4-5.8				
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 (Φmhos/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-032111-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 03/21/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), Lynne Jackson (TVA), Mark Greer (RSI) T. Walls (RSI) Eddie Arnold (RSI) Gib Fry (RSI) E. Hickey (RSI) A Johnson (RSI) J. Kerr (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Express 1 ~~Access America transport~~ rg 032211

General Comments:

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

TVA-KIF-NTC-TOX-003

Batch D

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-CRM7.0-GLEC-032111	G	03/21/2011	1302	(80) 10L cubitainers	9.69 ~~1302~~ rg 032211	NA	NA	✓	NA	8913	TVA log Both 22-4.2	D.S	13:00	Good

rg 032211

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk / RSI	032211 / 0730	D. McCauley / GLEC	3/23/11 1300 hrs

All custody seals intact

Associated UPS Tracking #s (if applicable):

TVA tag # 0011711. intact

GLEC
Great Lakes Environmental Center

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	3/23/11			DS	
SAMPLE ID	Bulk SW-CRM7.0 -GLEC-0321/11				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8913				
COLLECTION DATE (Time Interval)	3/21/11 1302				
TEMPERATURE (≤6 degrees Celsius[1])	See TVA Log Book	2.3-4.2			
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Good, Clear				

[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 (Φmhos/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: 03/22/2011

COURIER COMPANY:
Express 1
~~Access America Transport~~
RJ032211

From:	To:
TVA c/o Ramona Josefczyk 189 Lakeshore Drive Harriman, TN 37748 865-250-8322	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:
80	2.5 gallon cubes of water in crates

Shippers Name/Company: Ramona Josefczyk / RS1

Date / Time: 032211 / 1050

Courier Signature/Company: Larry Mills Express (1)

Date / Time: 3/22/11 10:50

Receipt Signature/Company: DMcCauley / GLEC

Date / Time: 3/23/11 1300hrs. Dennis McCauley

Corresponding Chains of Custody: All COC seals intact. DMcCauley

BULKSW-032111-GLEC page 1 of 1	

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	~~3/21/2011~~ 03/22/2011	Bill of Lading Number	150786
Customer PO		Carrier Name	express 1 ~~ACCESS AMERICA TRANSPORT~~ rg 032211
	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~~ ~~216~~ rg032211 231-941-223
Contact Name	Adam Johnson	Contact Name	~~Dennis McCauley~~ rg032211 Dennis McCauley
Bill Freight to:		Special Instructions	Pickup 3/22 per Jason Brown's instructions, deliver 3/23 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees 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 Ramona Josefczyk Ramona Josefczyk Carrier Larry Mills TR2324

Per RSI Date 032211 Per Express (1) Date 3/22/11

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
150786				Water Samples	

RECORD COPY

BIOMONITORING CHAIN OF CUSTODY RECORD

COC No. BULKSED-032311-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 02/09/11

Location: Clinch Reference Location

Logbook: TVA-KIF-NTC-TOX-003

Collected By: R. Josefczyk (RSI), L. Jackson (TVA), R. Vance (RSI), E. Arnold (RSI), M. Greer (RSI), D. Mathis (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify):_

General Comments:
"CLINCHREFERENCE" is a composite of sample locations CRM 6.5 and CRM 7.5 retained at TVA-KIF on behalf of GLEC. Approximately 3 gallons were collected into each of 2-5 gallon buckets for retain. This COC is accompanying one of those 5 gallon buckets overnight for early morning delivery to GLEC. The original sample date was 02/09/11. Shipment date is 03/23/11 for 03/24/11 delivery.

Field Identification / Sample Description	Grab/ Comp.	Collection Date/Time		Number of Containers & Volume Collected	Depth DM032311 ~~(m)~~ ft.	Rain Event? (Mark as Appropriate)				Laboratory Use (as applicable)				
Example: BULKSED_CRM0.0	----	Date	Time	----	----	Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSED-CLINCHREFERENCE-GLEC-020911	C	02/09/11	0940	1 x 5 gal HDPE	0.0-0.5	N/A	N/A	N/A	N/A	8914	0.7°C	DS	9:00	Good

DM032311

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/ Affiliation:	Date/Time
RSI	032311/1600	Glec	03/24/11

All COC's intact

Associated UPS Tracking #s (if applicable): UPS Tracking No: 1Z 939 EX2 15 9831 0193 ✓ Intact

Great Lakes Environmental Center

Sample CHECK-IN FORM

CLIENT: TENNESSEE VALLEY Authority PROJECT NUMBER: 5069-01

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	3/24/11			DJ	
SAMPLE ID	Clinch Reference				
TYPE (W=water, SED=sediment, M=material)	Sed				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8914				
COLLECTION DATE (Time Interval)	2/09/11 9:40				
TEMPERATURE (≤6 degrees Celsius[1])	0.7°C				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Muddy Somewhat Sandy				

[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 (Φmhos/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:

DAVID MATHIS
865-202-831?
KINGSTON FOS LANT/TVA
189 LAKESHOR VE
HARRIMAN TN 37748

90 LBS

1 OF 1

DWT: 19,19,18
AH

SHIP TO:
DENNIS MCCAULEY
231.941.2230
GREAT LAKES ENVIRONMENTAL CENTER
739 HASTINGS ST.
TRAVERSE CITY MI 49686-3458

H

MI 496 1-01

UPS EARLY A.M.
TRACKING #: 1Z 939 EX2 15 9831 0193

1+

BILLING: P/P

Short Code: 0214135

CS 13.1.13. WXPIE70 12.0A 01/2011

TM

and notice of limitation of liability. Where allowed by law, shipper authorizes UPS to act as forwarding agent for export control and
shipper certifies that the commodities, technology or software were exported from the US in accordance with the Export Administration
Bilted.

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-032311-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 03/23/2011

Location: CRM7.0

Collected By: C. Lynne Jackson (TVA), Mark Greer (RSI), Gib Frye (RSI), Josh Kerr (RSI), Travis Walls (RSI), Greg Schwartz (RSI), Emma Hickey (RSI), Russ Vance (RSI), Ed Arnold (RSI), Jesse Morris (RSI), Elizabeth Burton (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Express 1

General Comments:

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

Logbook: TVA-KIF-NTC-TOX-003

Batch E

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	GLEC # ~~Log #~~ DR	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-CRM7.0-GLEC-032311	G	03/23/2011	1036	(80) 10L cubitainers	10.05	NA	NA	✓	NA	8917	2.2-3.2 See TVA Book	DR	18:51	CLEAR

Cg 032311

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Lynne Jackson (TVA)	032311 1315	RSI	032311/1315
RSI	032811 1502	/GLEC	03/29/11 18:51

Associated UPS Tracking #s (if applicable): TVA Padlock #0011923 ✓ INTACT

All COC's Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 03/28/10

COURIER COMPANY:

Access America Transport

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 ✓	40 "milk crates" containing 2-2.5 gallon cubitainers each.

Shippers Name/Company: David Mathis / RSI

Date / Time: 032811 / 1830

Courier Signature/Company: Larry Mills EXPRESS

Date / Time: 03/28/11 / 18:31

Receipt Signature/Company: [illegible] / GLEC

Date / Time: 03/29/11 / 18:51

Corresponding Chains of Custody: DAVID ROSIER

✓

BULKSW-032311-GLEC Page 1 of 1	

BILL OF LADING # 150787

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

DM032811

Shipment Date	~~3/24/2011~~ 03/~~25~~ 28/2011	Bill of Lading Number	150787
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	

Special Instructions

Pickup 3/~~25~~ 28 per Jason Brown's instructions, deliver 3/~~26~~ 29 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees for the extent of the trip.

DM032811 DM032811

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	
David Mathis / RSI		Larry Mills Express	
Per	Date	Per	Date
	03/28/11		3/28/11

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
150787				Water Samples	

Great Lakes Environmental Center

Sample CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	03/29/11			MWr	
SAMPLE ID	BULKSW-CRM70-GLEC 032311				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8917				
COLLECTION DATE (Time Interval)	03/23/11 1036				
TEMPERATURE (≤6 degrees Celsius[1])	2.2 - 3.2 See TVA Book				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Clear				

[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 (Φmhos/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-033011-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 03/30/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), Lynne Jackson (TVA), Mark Greer (RSI), Josh Kerr (RSI), Emma Hickey (RSI), Travis Walls (RSI), Gib Frye (RSI), Adam Johnson (RSI), Elizabeth Burton (RSI), Jesse Morris (RSI), Greg Schwartz (RSI), Ed Arnold (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Express 1

General Comments:

Bulk Clinch River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.
Turbidity range: 4.9NTU - 20.1NTU except for one reading of 20.1NTU @ rj033011 all readings <10NTU.

Batch F TVA-KIF-NTC-TOX-003

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-CRM7.0-GLEC-033011	G	03/30/2011	1328	(81) 10L cubitainers	8.42	NA	NA	V	NA	8919	See TVA Book 2.0-4.2	DS	15:15	Good
				rj 033011										

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk /RSI	033111 / 0720	RSI	033111 / 0720
RSI	033111 / 0912		04/1/11 / 15:13

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011890 ✓ Intact. All COC's Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 03/31/11

COURIER COMPANY:

Access America Transport (Express 1)

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:
81	81-2.5 gallon cubitainers of Clinch River Water packaged in 41 plastic "milk crates"..

Shippers Name/Company: David Mathis / RS1

Date / Time: 03/31/11 0954

Courier Signature/Company: [illegible]

Date / Time: 3/31/11 0954

PRO 758513
MILLS LAW
TR 2324

Receipt Signature/Company: [illegible]

Date / Time: 4/1/11 15:15

Corresponding Chains of Custody:

BULKSW-033011-GLEC Page 1 of 1	

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

DM033111

Shipment Date	~~3/28/2011~~ 03/~~29~~ 31/2011	Bill of Lading Number	150788
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	

31 04/01

Pickup 3/~~29~~ 31 per Jason Brown's instructions, deliver ~~3/30~~ DM033111 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees 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	
David Mathis / RSI	0954	Tony Mills	
Per	Date	Per	Date
	03/31/11		3/31/11

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
150788				Water Samples	

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-040411-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 04/04/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), Lynne Jackson (TVA), Mark Greer (RSI), Russ Vance (RSI), Josh Kerr (RSI), Emma Hickey (RSI), Travis Walls (RSI), Gib Frye (RSI), Elizabeth Burton (RSI), Jesse Morris (RSI)

Dennis McCauley
dmccauley@glec.com
Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
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-003

Bulk Clinch River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.
Turbidity: ranged from 4.2 NTU to 4.9 NTU during collection

Batch G

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-CRM7.0-GLEC-040411	G	04/04/2011	0909	(81) 10L cubitainers	9.08	NA	NA	✓	NA	8922	DS 9/21/11 ~~2.3-4.0~~	DS	13:15	Good Clean
											See TVA Log Book			
											2.3-4.0			
			RJ 03	040411 RJ 040411										

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk / RSI	040411 / 1152	RSI	040411 / 1152
RSI	040411 / 1202	GLEC	04/05/11 13:15

All COC's Intact

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011742 ✓ Intact

GLEC
Great Lakes Environmental Center

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

DATE RECEIVED	4/5/11			DS	INITIALS
SAMPLE ID	Bulk SW CEM7.0 GLEC041011				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8922				
COLLECTION DATE (Time Interval)	4/4/11 9:09	2,3-4.0			
TEMPERATURE (≤6 degrees Celsius[1])	See TVA BOOK				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	Clear NO odor				

[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 (Φmhos/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: 04/04/11

COURIER COMPANY:

Access America Transport (Express 1)

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:
81	81-2.5 gallon cubitainers of Clinch River Water packaged in 41 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 040411 / 1321

Courier Signature/Company: [illegible] TR2324

Date / Time: 04/04/11 1321

Receipt Signature/Company: [illegible]

Date / Time: 4/5/11 13:15

Corresponding Chains of Custody:

BULKSW-040411-GLEC Page 1 of 1	

TVA Padlock # 0011742

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	~~3/28/2011~~ 04/04/2011	Bill of Lading Number	150788
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	

DM040411 DM040411

Pickup 04/04 per Jason Brown's instructions, deliver 04/05 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees 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
David Mathis/RSI	Larry Mills
Per	Per
Date 040411/1321	Date 4/4/11 13:21

TR 2324

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
150788				Water Samples	

CHAIN OF CUSTODY RECORD RECORD COPY **Page 1 of 1** **COC No. BULKSW-040611-GLEC**

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 04/06/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), Lynne Jackson (TVA), Mark Greer (RSI), Russ Vance (RSI), Josh Kerr (RSI), Emma Hickey (RSI), Travis Walls (RSI), Gib Frye (RSI), Elizabeth Burton (RSI) Adam Johnson (RSI) Greg Schwartz (RSI) Eddie Arnold (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify):_

General Comments:

Bulk Clinch River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.
turbidity: 19.1 - 52.1 NTU

Batch H ~~TVA NTC~~ rj040611TVA-KIF-NTC-TOX-00?

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-CRM7.0-GLEC-040611	G	04/06/2011	1310	(81) 10L cubitainers	9.38	NA	NA	✓	NA	8928	SEE TVA BOOK 2.6-3.7	DS	10:45	Good Clear

RJ040611

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk / RSI	040611 / 1620	RSI	040611 / 1620
/ RSI	040711 / 0847	GLEC	04/08/11 10:45

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011758 ✓ Intact

All COC's Intact

GLEC
Great Lakes Environmental Center

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: Z 506903

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	4/8/11			DS	
SAMPLE ID	BULKSW-GRM7.0 DS 4/8/11 GLEC ~~040611~~	040611			
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8928				
COLLECTION DATE (Time Interval)	4/6/11 1350				
TEMPERATURE (≤6 degrees Celsius[1])	See TVA BOOK CANOE ( )				
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 (Φmhos/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: 04/07/11

COURIER COMPANY:

Access America Transport (Express 1)

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:
81	81-2.5 gallon cubitainers of Clinch River Water packaged in 41 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 040711/0903

Courier Signature/Company: [illegible]

Date / Time: 4/7/11 09:03

Receipt Signature/Company: [illegible] GLEC

Date / Time: 10:41 4/8/11

Corresponding Chains of Custody:

BULKSW-040611-GLEC Page 1 of 1	[redacted]
[redacted]	[redacted]

TVA Padlock #0011758 ✓

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	~~4/4/2011~~ 04/~~05~~ 07/2011 DMc040711	Bill of Lading Number	150792
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 4/~~5~~ 7 DMc040711 per Jason Brown's instructions, deliver 4/~~6~~ 8 DMc040711 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees 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	
Per David Mathis (RS)	Date 041071/0903	Per Larry Mills	Date 4/7/11 09:03

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
150792				Water Samples	

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-041111-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 04/11/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), C. Lynne Jackson (TVA), Mark Greer (RSI), Russ Vance (RSI), Emma Hickey (RSI), Travis Walls (RSI), Gib Frye (RSI), Elizabeth Burton (RSI), Jesse Morris (RSI), Adam Johnson (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Access America (Express 1)

General Comments:

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

Turbidity: 5.0 -10.5 NTU

Batch I TVA-KIF-NTC-TOX-003

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-CRM7.0-GLEC-041111	G	04/11/2011	0948	(121) 10L cubitainers	9.24	NA	NA	✓	NA	8938	See Back NA	DS	12:30	Good
											~~6.0-2.7~~	DS 9/21/11		
											6.0-2.7			

rg 041111

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
[signature] (RSI)	041111 1250	[signature] RSI	041111 1250
[signature] RSI	041111 1320	[signature] Don Smith GLEC	4/12/11 12:30

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011786 ✓ Intact

All COC's Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 04/11/11

COURIER COMPANY:

Access America Transport (Express 1)

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:
121	121-2.5 gallon cubitainers of Clinch River Water packaged in 61 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 041111 / 1355

Courier Signature/Company: Larry Mills

Date / Time: 4/11/11 1355

Receipt Signature/Company: [illegible] GLEC

Date / Time: 4/12/11 12:30

Corresponding Chains of Custody:

BULKSW-041111-GLEC Page 1 of 1	

TVA Padlock #0011786

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	04/11/11	**Bill of Lading Number**	150793
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 4/11 per Jason Brown's instructions, deliver 4/12 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees 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**

David Mathis/RSI — Larry Mills

Per **Date** **Per** **Date**

04/11/11 1355 — 4/11/11 13:55

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
150793				Water Samples	

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

DATE RECEIVED	4/12/11			DS	INITIALS
SAMPLE ID	DS 9/12/11 ~~8~~ Bulk Sw CRMTD Glass				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8938				
COLLECTION DATE (Time Interval)	4/11/11 9:38				
TEMPERATURE (≤6 degrees Celsius[1])	2.7 - 5.7 TVA logbook				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	No odor 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 (Φmhos/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:
ample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

Logbook ID → 1 KIF-NTC-TOX-003

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-041311-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 04/13/2011

Location: CRM7.0

Collected By: C. Lynne Jackson (TVA), Mark Greer (RSI), Elizabeth Burton (RSI), Russ Vance (RSI), Josh Kerr (RSI), Travis Walls (RSI), Jesse Morris (RSI), Adam Johnson (RSI), Fahran Ferguson (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify): Access America (Express 1)

General Comments:

Bulk Clinch River reference water for sediment toxicity study collected in 2.5 gallon (10L) cubitainers.
Start Collection Sample Turbidity = 10.1 NTU
Completion Sample Turbidity = 8.7 NTU 041311

Batch J

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-CRM7.0-GLEC-041311	G	04/13/2011	0950	(81) 10L cubitainers	9.55	NA	NA	X	NA	8943	See Book	DS	11:00	Good
											2.3-4.2			
				041311										

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
RSI	041311/1335	RSI	041311/1335
RSI	04/14/1/0817	GLEC	4/15/11 11:00

All COC's Intact

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011810 ✓ Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 04/14/11

COURIER COMPANY:

Access America Transport (Express 1)

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:
81	81-2.5 gallon cubitainers of Clinch River Water packaged in 41 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 04/14/11 / 0858

Courier Signature/Company: Larry Mills 4/14/11

Date / Time: 08:58

Receipt Signature/Company: [illegible] GLEC

Date / Time: 4/15/11 11:00

Corresponding Chains of Custody:

BULKSW-041311-GLEC Page 1 of 1	

TVA Padlock # 0011810

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	~~4/11/2011~~ 04/14/2011	**Bill of Lading Number**	**150794**
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 04/11 per Jason Brown's instructions, deliver 04/15 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees 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)

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Shipper

David Mathis/TSI

Per **Date**

041411/0858

Carrier

Larry Mills 4/14/11

Per **Date**

0858

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	4/14/11			DS	
SAMPLE ID	Bulk Sm. ARMD Clec 041311				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8943				
COLLECTION DATE (Time Interval)	4/13/11 9:50				
TEMPERATURE (≤6 degrees Celsius[1])	2.3 - 4.2	See Book TVA			
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 (Φmhos/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:

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
150794				Water Samples	

RECORD COPY

CHAIN OF CUSTODY RECORD

COC No. BULKSW-042511-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 04/25/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), C. Lynne Jackson (TVA), Mark Greer (RSI), Elizabeth Burton (RSI), Russ Vance (RSI), Travis Walls (RSI), Gib Frye (RSI), Josh Kerr (RSI), Jesse Morris (RSI), Adam Johnson (RSI)

Dennis McCauley
dmccauley@glec.com
Great Lakes Environmental Center (GLEC)
739 Hastings Street
Traverse City, MI 49686
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-003

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

Turbidity = 7.8 NTU – 10.6 NTU

Batch K

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	110 rcj042511	----	Yes	If Yes, Inches	No	Trace	Log #	Arrival Temp. (°C)	By	Time	Appearance
BULKSW-CRM7.0-GLEC-042511	G	04/25/2011	0955	~~(90)~~ 10L cubitainers	9.41	NA	NA	V	NA	8958	See TVA Book	DS	15:10	Good
											~~2.7-4.8~~	DS 4/21/11		
											2.7-4.8 3			
				rcj 042511										

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk RSI	042511 / 1250	RSI	042511 / 1250
RSI	042511 / 1305	Glec	04/26/11 13:10

Associated UPS Tracking #s (if applicable): TVA Padlock #0011987 ✓ Intact

All COC's Intact

COURIER TRANSPORT DOCUMENTATION

DATE: 04/25/11

COURIER COMPANY:

Access America Transport (Express 1)

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:
110	110-2.5 gallon cubitainers of Clinch River Water packaged in 55 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 042511 / 1327

Courier Signature/Company: Larry Mills 4/25/11 EXPRESS ONE

Date / Time: 4/25/11 13:27

Receipt Signature/Company: [illegible] GLEC

Date / Time: 4/26/11 15:10

Corresponding Chains of Custody:

BULKSW-042511-GLEC Page 1 of 1 ✓	[redacted]
[redacted]	[redacted]

TVA Padlock #0011987W ✓

TVA

STRAIGHT BILL OF LADING NOT NEGOTIABLE

AFFIX PRO LABEL HERE

Shipment Date	04/25/2011	**Bill of Lading Number**	150795
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 4/25 per Jason Brown's instructions, deliver 4/26 AM. There is a gate at the shippers, call Adam Johnson at 865-207-2335 to open gate. Reefer must maintain 36 degrees 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)

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Shipper		**Carrier**	
David Mathis / TZ1		Larry Mills	
Per	**Date**	**Per**	**Date**
	042511 / 1327		4/25/11 13:27

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
150795				Water Samples	

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	4/26/11			DS	
SAMPLE ID	Bulk Sw - CRm 1.0-Gle 042511				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8958				
COLLECTION DATE (Time Interval)	4/25/11				
TEMPERATURE (≤6 degrees Celsius[1])	See TVA Book 2.3-4.8				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	clear good				

[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 (Φmhos/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-050211-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 05/02/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), C. Lynne Jackson (TVA), Mark Greer (RSI), Josh Kerr (RSI), Russ Vance (RSI), Travis Walls (RSI), Gib Frye (RSI), Elizabeth Burton (RSI), Jesse Morris (RSI), Adam Johnson (RSI)

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

Delivered By (Circle One):

FedEx UPS Bus Client Courier

Other (specify):_

General Comments: TVA-KIF-NTC-TOX-003

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

Turbidity: 7.5 NTU - 9.2 NTU

Batch L

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-CRM7.0-GLEC-050211	G	05/02/2011	0947	(80) 10L cubitainers	9.54	NA	NA	✓	NA	8969	SEE TVA BOOK	DS	15:15	Good
											3.2 - ~~4.7~~ 4.8	DS 9/21/11		

rg 050211

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
TVA Frye (RSI)	05/02/11 1132	RSI	050211/1132
RSI	05/02/11 1213	GLEC	05/03/11/15:15

All COC's Intact

Associated UPS Tracking #s (if applicable): TVA Padlock # 0011956 Intact

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

DATE RECEIVED	5/3/11			DS	INITIALS
SAMPLE ID	Bulk Sw <FM7.0 Order 050211				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8469				
COLLECTION DATE (Time Interval)	5/2/11 09:47				
TEMPERATURE (≤6 degrees Celsius[1])	See TVA Book 3.2-4.7				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	color 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 (Φmhos/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: 05/02/11

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:
80	80-2.5 gallon cubitainers of Clinch River Water packaged in 40 plastic "milk crates".

Shippers Name/Company: David Mathis / RSI

Date / Time: 050211 / 1313

Courier Signature/Company: Ray Daily EXPRESS-1
Ray Daily

Date / Time: 5-2-11 13:13

Receipt Signature/Company: GLEC

Date / Time: 5/3/11 15:15

Corresponding Chains of Custody:

BULKSW-050211-GLEC Page 1 of 1 ✓	

TVA PADLOCK # 0011956

RECORD COPY

CHAIN OF CUSTODY RECORD

Page 1 of 1

COC No. BULKSW-051211-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 05/12/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), ~~C. Lynne Jackson (TVA)~~ rcj051211, Mark Greer (RSI) rcj051211

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

Delivered By (Circle One):

FedEx (UPS) Bus Client Courier

Other (specify):_

General Comments: TVA-KIF-NTC-TOX-003

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

Turbidity: 9.3 NTU – 21.5 NTU

Batch M Not actually used

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-CRM7.0-GLEC-051211	G	05/12/2011	0940	(6) 10L cubitainers	~~No~~ rcj051211 10.29	NA	NA	✓	NA	8972	See TVA Book 1.3-1.9	DJ	14:00	~~DS~~ DJ 05/21/11 Good

rcj051211

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk RSI	051211 / 1103	RSI	051211 / 1103
RSI	051211 / 1305	Glec	05/13/11 14:00

Intact

All COC's Intact; sample Not Used

Associated UPS Tracking #s (if applicable): UPS Tracking Nos: 1Z939EX2159275 6768, 1Z939EX2159495 1776

GLEC
Great Lakes Environmental Center

Sample
CHECK-IN FORM

CLIENT: TVA PROJECT NUMBER: 5069-03

INITIAL SAMPLE CHEMISTRY (UPON RECEIPT)

					INITIALS
DATE RECEIVED	5/13/11			DS	
SAMPLE ID	BULK SW CRM7.0 GLEC @ 5/12/11				
TYPE (W=water, SED=sediment, M=material)	W				
COLLECTION (G=grab, C=composite)	G				
GLC NUMBER	8972				
COLLECTION DATE (Time Interval)	5/12/11 9:40				
TEMPERATURE (≤6 degrees Celsius[1])	See TVA Log 1.3 – 1.9				
SAMPLE DESCRIPTION / OBSERVATIONS (clarity, color, odor)	No odor Clear				

[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:
L used:	mL used:	mL used:	mL used:	mL used:	mL used:
Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:	Sample Volume:

NON-RECORD COPY

CHAIN OF CUSTODY RECORD

COC No. BULKSW-051211-GLEC

Client: TVA

Project Name: KIF Ash Toxicity Study

Date of Sample Collection: 05/12/2011

Location: CRM7.0

Collected By: Ramona Josefczyk (RSI), ~~C. Lynne Jackson (TVA)~~ rcj051211, Mark Greer (RSI) rcj051211

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

Delivered By (Circle One):

FedEx (UPS) Bus Client Courier

Other (specify):_

General Comments: TVA-KIF-NTC-TOX-003

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

Turbidity: 9.3 NTU – 21.5 NTU

Batch M

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-CRM7.0-GLEC-051211	G	05/12/2011	0940	(6) 10L cubitainers	~~10~~ 10.29 rcj051211	NA	NA	✓	NA					

rcj051211

Sample Custody – Fill In From Top Down

Relinquished By (Signature)/Affiliation:	Date/Time	Received By (Signature)/Affiliation:	Date/Time
Ramona Josefczyk RSI	05/12/11 / 1103	RSI	051211 / 1103
RSI	051211 / 1305		

Associated UPS Tracking #s (if applicable): UPS Tracking Nos: 1Z939EX2159275 6768, 1Z939EX2159495 1776

2 OF 2

[redacted] FOSSIL PLANT/TVA
189 LAKESHORE DRIVE
HARRIMAN TN 37748

DWT: 38,18,16
AH

SHIP TO:
DENNIS McCAULEY
231.941.2230
GREAT LAKES ENVIRONMENTAL CENTER
739 HASTINGS ST.
TRAVERSE CITY MI 49686-3458

H

MI 496 1-01

UPS EARLY A.M.

1+

TRACKING #: 1Z 939 EX2 15 9495 1776

BILLING: P/P

Short Code: 0214135

CS 13.1.13. WXPIE70 15.0A 04/2011

TM

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PLACE SHIPPING LABEL
WITHIN BRACKETS

01113701 10 06 NW

DAVID MATHIS
865-202-8313
KINGSTON FOSSIL PLANT/TVA
189 LAKESHORE DRIVE
HARRIMAN TN 37748

148 LBS

2 OF 2

DWT: 38,18,16
AH

SHIP TO:
DENNIS MCCAULEY
231.941.2230
GREAT LAKES ENVIRONMENTAL CENTER
739 HASTINGS ST.
TRAVERSE CITY MI 49686-3458

H

MI 496 1-01

UPS EARLY A.M.
TRACKING #: 1Z 939 EX2 15 9495 1776

1+

BILLING: P/P

Short Code: 0214135

CS 13.1.13. WXPIE70 15.0A 04/2011

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149 LBS

1 OF 2

DAVID MATHIS
865-202-8313
KINGSTON FOSSIL PLANT/TVA
189 LAKESHORE DRIVE
HARRIMAN TN 37748

DWT: 38,18,16
AH

SHIP TO:
[illegible]NIS MCCAULEY
[illegible]1.2230
[illegible]AKES ENVIRONMENTAL CENTER
7[illegible]NGS ST.
TR[illegible]E CITY MI 49686-3458

H

MI 496 1-01

UPS EARLY A.M. 1+

TRACKING #: 1Z 939 EX2 15 9275 6768

BILLING: P/P

Short Code: 0214135

CS 13.1.13. WXPIE70 15.0A 04/2011

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TM

WITHIN BRACKETS

DAVID MATHIS
865-202-8313
KINGSTON FOSSIL PLANT/TVA
189 LAKESHORE DRIVE
HARRIMAN TN 37748

149 LBS

1 OF 2

DWT: 38,18,16
AH

SHIP TO:
DENNIS MCCAULEY
231.941.2230
GREAT LAKES ENVIRONMENTAL CENTER
739 HASTINGS ST.
TRAVERSE CITY MI 49686-3458

H

MI 496 1-01

UPS EARLY A.M.
TRACKING #: 1Z 939 EX2 15 9275 6768

1+

BILLING: P/P

Short Code: 0214135

WXPIE70 15.0A 04/2011

TM

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TRAVERSE CITY MI 49686-3458

P:M2 S:ODD I:

203-1001 X

1Z939EX2159275 6768

MCH1GLP MITCY111 May 13 11:16:00 2011
US 4961 HIP 10.2.1 INT4420

900

01113/01 ... MW

Appendix B
Sediment Density Weigh Sheets

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRS (GLC No. 8897), LCS-Laboratory Control Sediment

Test Dates:
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Chironomus dilutus*
Initials DS/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	**Actual Weight of CRS**		**Acutal Weight of LCS**
1	100 ml	173		150
2	100 ml	179		151
3	100 ml	176		146
Mean		176		149
grams/ml		1.76		1.49
grams/100ml		176		149

Sediment Dilution Chart										
Test Control Samples	**Total Sediment Volume per Concentration (mL)**	**CRS 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)	(mL) Volume	Weight (g)	**Volume (mL)**
CRS +CRW	1200	100	176	176				100	176	175
LCS + CRW	1200	100	149	149				100	149	175
LCS + GLW	1200	100	149	149				100	149	175
GLW	0	0	∅	0				0	0	175
										175
										175

* Two Overlying Water Renewals with in a 24 hour period; 175 mls every 12 hours
CRW=Clinch River Water
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Replicate								
Test Control Samples								
Replicate Number	**CRS + CRW**		**LCS + CRW**	**LCS + GLW**				
1	176		135	137				
2	177		140	138				
3	176		135	137				
Mean	177		137	137				

Scale Ohaus #17
Model CR10R Serial # 063 2146-6FK
PJ400 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889)

Test Dates: March 21-April 19, 2011
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Chironomus dilutus*
Initials DS/DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	Actual Weight of Investigative Sediment CRM 1.5		Acutal Weight of Dilution Sediment CRS
1	100 ml	133		173
2	100 ml	139		179
3	100 ml	136		176
Mean		136		176
grams/ml		1.36		1.76
grams/100ml		136		176

Sediment Dilution Chart										
Test Concentratrions	Total Sediment Volume per Concentration (mL)	CRM 1.5 GLC No: 8889			Dilution Sediment- CRS GLC No: 8897			Total Sediment Volume per Concentration ~~Sediment per Replicate~~ (g)		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	Volume (mL)	Total Weight (g)	Volume (mL)
10%	1200	120	163	163.2	1080	1901	1901	1200	2.064	175
20%	1200	240	326	326.4	960	1690	1690	1200	2016	175
40%	1200	480 653	~~653~~	652.8	720	1267	1267	1200	1920	175
60%	1200	720	979	979.2	480	845	844.8	1200	1824	175
80%	1200	960	1306	1306	240	422	422.4	1200	1728	175
100%	1200	1200	1632	1632	0	0	0	1200	1632	175

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

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	10%	20%	40%	60%	80%	100%		
1	168	169	156	145	141	137		
2	162	164	159	146	143	136		
3	168	168	159	151	145	136		
Mean	166	167	158	147	143	136		

Scale: Ohaus #17
PJ400 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 2.0 (GLC No. 8891)

Test Dates: March 21-April 19, 2011
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Chironomus dilutus*
Initials DS/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	**Actual Weight of Investigative Sediment CRM 2.0**		**Acutal Weight of Dilution Sediment CRS**
1	100 ml	~~139~~ ~~DS 140~~ 145		173
2	100 ml	8/28/11 148		179
3	100 ml	150		176
Mean		148		176
grams/ml	9/21/11	DS ~~1.48~~ 1.48		1.76
grams/100ml	9/21/11	DS ~~148~~ 148		176

Sediment Dilution Chart										
Test Concentratrions	**Total Sediment Volume per Concentration (mL)**	**CRM 2.0 GLC No: 8891**			**Dilution Sediment- CRS GLC No: 8897**			Total Sediment Volume per Concentration ~~Sediment per Replicate~~		**Volume of Overlying Water per Renewal***
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	total Weight (g)	**Volume (mL)**
10%	1200	120	178	178	1080	1901	1901	1200	2079	175
20%	1200	240	355	355	960	1690	1690	1200	2045	175
40%	1200	480	710	710	720	1267	1267	1200	1977	175
60%	1200	720	1066	1066	480	845	844.8	1200	1921	175
80%	1200	960	1421	~~1428~~ 1421	240	422	422.4	1200	1843	175
100%	1200	1200	1776	1776	0	0	0	1200	1776	175

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

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	**10%**	**20%**	**40%**	**60%**	**80%**	100%		
1	166	163	161	159	148	145		
2	165	163	160	159	147	148		
3	167	161	162	159	147	144		
Mean	166	162	161	159	147	146		

Scale: Ohaus #17 9/21/11

PJ400 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893)

Test Dates: March 21-April 19, 2011
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Chironomus dilutus*
Initials DS/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	**Actual Weight of Investigative Sediment CRM 3.0**		**Acutal Weight of Dilution Sediment CRS**
1	100 ml	136		173
2	100 ml	140		179
3	100 ml	140		176
Mean		138.7		176
grams/ml		1.39		1.76
grams/100ml		138.7		176

Sediment Dilution Chart										
Test Concentratrions	**Total Sediment Volume per Concentration (mL)**	**CRM 3.0 GLC No: 8893**			**Dilution Sediment- CRS GLC No: 8897**			Total Sediment (g) volume per concentration ~~Sediment per Replicate~~		**Volume of Overlying Water per Renewal***
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Total Weight (g)	**Volume (mL)**
10%	1200	120	166	166.4	1080	1901	1901	1200	2067	175
20%	1200	240	333	332.9	960	1690	1690	1200	2023	175
40%	1200	480	666	665.8	720	1267	1267	1200	1933	175
60%	1200	720	999	998.6	480	845	844.8	1200	1844	175
80%	1200	960	1332	1332	240	423	422.4	1200	1755	175
100%	1200	1200	1664	1664.4	0	0	0	1200	1664	175

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

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	**10%**	**20%**	**40%**	**60%**	**80%**	100%		
1	167	166	158	153	146	138		
2	169	167	156	153	145	138		
3	170	168	158	153	144	139		
Mean	169	167	157	153	145	138		

Scale: OHaus #17
PJ400 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895)

Test Dates:
Test Type: Long Term Whole Sediment Toxicity Survival,Growth, Emergence
Test Species: *Chironomus dilutus*
Initials DS/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	Actual Weight of Investigative Sediment CRM 4.0		Acutal Weight of Dilution Sediment CRS
1	100 ml	138		173
2	100 ml	137		179
3	100 ml	140		176
Mean		138.3		176
grams/ml		1.38		1.76
grams/100ml		138		176

Sediment Dilution Chart											
Test Concentratrions	Total Sediment Volume per Concentration (mL)	CRM 4.0 GLC No: 8895			Dilution Sediment- CRS GLC No: 8897			~~Sediment per Replicate~~ Total Sediment (g) volume per concentration		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	Volume (mL)	total Weight (g)	Volume (mL)
10%	1200	120	166	~~166.0~~ 166.0 DS 8/23/11	1080	1901	1901	1200	2067	175
20%	1200	240	332	332.	960	1690	1690	1200	2022	175
40%	1200	480	664	664	720	1267	1267	1200	1931	175
60%	1200	720	996	996	480	845	844.8	1200	1841	175
80%	1200	960	1328	1328	240	423	422.4	1200	1751	175
100%	1200	1200	1656	1656	0	0	0	1200	1656	175

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

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	10%	20%	40%	60%	80%	100%		
1	163	156	153	149	146	140		
2	168	154	153	153	149	140		
3	167	155	154	152	145	137		
Mean	166	154	153	151	147	139		

QC=mud CRM 4.0

Scale: Ohaus #17
PJ400 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRS (GLC No. 8897), LCS-Laboratory Control Sediment

Test Dates:
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Hyalella azteca*
Initials DS/Rest/DS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	**Actual Weight of CRS**		**Acutal Weight of LCS**
1	100 ml	173		150
2	100 ml	179		151
3	100 ml	176		146
Mean		176		149
grams/ml		1.76		1.49
grams/100ml		176		149

Sediment Dilution Chart										
Test Control Samples	**Total Sediment Volume per Concentration (mL)**	**CRS Control and Laboratory Control**			Sediment per Replicate					**Volume of Overlying Water per Renewal***
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	Vol. (ml)	Actual Weight (g)	Weight Based on Density (g)			**Volume (mL)**
CRS +CRW	1000	1000ml	1760	1760	100	N/A	176			175
LCS + CRW	1000	1000ml	1490	1490	100	9/17A	149			175
LCS + GLW	1000	1000	1490	1490	100		149			175
GLW	0	0	0	0						175
										175
										175

* Two Overlying Water Renewals with in a 24 hour period; 175 mls every 12 hours
CRW=Clinch River Water
GLW=GLEC Laboratory Water

Actual Weight of Sediment Added to Replicate								
Test Control Samples								
Replicate Number	**CRS + CRW**		**LCS + CRW**	**LCS + GLW**				
1	168.		151	150				
2	170		151	151				
3	170		149	151				
Mean	169		150	151				

0 Hous # 17
PJ400 # 17

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889)

Test Dates: March 21-April 19, 2011
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Hyalella azteca*
Initials DS/MW/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	Volume per Replicate	Actual Weight of Investigative Sediment CRM 1.5		Acutal Weight of Dilution Sediment CRS
1	100 ml	133		173
2	100 ml	139		179
3	100 ml	136		176
Mean		136		176
grams/ml		1.36		1.76
grams/100ml		136		176

Sediment Dilution Chart										
Test Concentratrions	Total Sediment Volume per Concentration (mL)	CRM 1.5 GLC No: 8889			Dilution Sediment- CRS GLC No: 8897			Theoretical Sediment per Replicate		Volume of Overlying Water per Renewal*
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	Volume (mL)	Weight (g)	Volume (mL)
10%	1000	100	136	136	900	1584	1584	100	172	175
20%	1000	200	272	272	800	1408	1408	100	168	175
40%	1000	400	544	544	600	1056	1056	100	160	175
60%	1000	600	816	816	400	704	704	100	152	175
80%	1000	800	1088	1088	200	352	352	100	144	175
100%	1000	1000	1360	1360	0	0	0	100	136	175

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

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	10%	20%	40%	60%	80%	100%		
1	179	152	150	152	137	142		
2	159	156	147	143	131	142		
3	162	159	149	143	141	139		
Mean	167	156	149	146	136	141		

Scale: Ohaus #17
PJ400 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 2.5 (GLC No. 8892)

Test Dates: March 21-April 19, 2011
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Hyalella azteca*
Initials DS/RWG/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	**Actual Weight of Investigative Sediment CRM 2.5**		**Acutal Weight of Dilution Sediment CRS**
1	100 ml	138		173
2	100 ml	136		179
3	100 ml	141		176
Mean		138		176
grams/ml		1.38		1.76
grams/100ml		138		176

Sediment Dilution Chart										
Test Concentratrions	**Total Sediment Volume per Concentration (mL)**	**CRM 2.5 GLC No: 8892**			**Dilution Sediment- CRS GLC No: 8897**			Theoretical **Sediment per Replicate**		**Volume of Overlying Water per Renewal***
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Weight (g)	**Volume (mL)**
10%	1000	100	138	138	900	1584	1584	100	172	175
20%	1000	200	276	276	800	1408	1408	100	168	175
40%	1000	400	552	552	600	1056	1056	100	161	175
60%	1000	600	828	828	400	704	704	100	153	175
80%	1000	800	1104	1104	200	352	352	100	146	175
100%	1000	1000	1380	1380	0	0	0	100	138	175

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

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	**10%**	**20%**	**40%**	**60%**	**80%**	100%		
1	166	170	165	152	144	137		
2	171	173	162	153	135	134		
3	169	164	169	154	138	136		
Mean	169	169	165	153	139	136		

Scale: Ohaus #17
PS400 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893)

Test Dates: March 21-April 19, 2011
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Hyalella azteca*
Initials DS/MWW/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	**Actual Weight of Investigative Sediment CRM 3.0**		**Acutal Weight of Dilution Sediment CRS**
1	100 ml	136		173
2	100 ml	148		179
3	100 ml	140		176
Mean		138.7		176
grams/ml		1.39		1.76
grams/100ml		138.7		176

Sediment Dilution Chart										
Test Concentratrions	**Total Sediment Volume per Concentration (mL)**	**CRM 3.0 GLC No: 8893**			**Dilution Sediment- CRS GLC No: 8897**			Theoretical **Sediment per Replicate**		**Volume of Overlying Water per Renewal***
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Weight (g)	**Volume (mL)**
10%	1000	100	139	138.7	900	1584	1584	100	172	175
20%	1000	200	278	277.4	800	1408	1408	100	169	175
40%	1000	400	555	544.8*	600	1056	1056	100	161	175
60%	1000	600	833	832.2	400	704	704	100	154	175
80%	1000	800	1110	1109.6	200	352	352	100	146	175
100%	1000	1000	1387	1387	0	0	0	100	139	175

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

* MWW 8/24/11

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	**10%**	**20%**	**40%**	**60%**	**80%**	100%		
1	158	170	156	153	138	138		
2	164	167	148	144	137	136		
3	162	162	155	148	138	136		
Mean	161	166	153	148	138	137		

Scale: Ohaus #17

PJ900 #13

Project Name: Tennesse Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.5 (GLC No. 8896)

Test Dates: March 21-April 19, 2011
Test Type: Long Term Whole Sediment Toxicity Survival,Growth,
Test Species: *Hyalella azteca*
Initials DS/MW/NS

Sediment Denisty and Dilution Chart Reporting Wet Weights and Volume Ratios

	Sediment Density			
Replicate Number	**Volume per Replicate**	**Actual Weight of Investigative Sediment CRM 4.5**		**Acutal Weight of Dilution Sediment CRS**
1	100 ml	140		173
2	100 ml	146		179
3	100 ml	143		176
Mean		143		176
grams/ml		1.43		1.76
grams/100ml		143		176

Sediment Dilution Chart										
Test Concentratrions	**Total Sediment Volume per Concentration (mL)**	**CRM 4.5 GLC No: 8896**			**Dilution Sediment- CRS GLC No: 8897**			Theoretical **Sediment per Replicate**		**Volume of Overlying Water per Renewal***
		Volume (mL)	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Actual Weight (g)	Weight Based on Density (g)	**Volume (mL)**	Weight (g)	**Volume (mL)**
10%	1000	100	143	143	900	1584	1584	100	173	175
20%	1000	200	286	286	800	1408	1408	100	169	175
40%	1000	400	572	572	600	1056	1056	100	163	175
60%	1000	600	858	858	400	705	704	100	156	175
80%	1000	800	1144	1144	200	352	352	100	150	175
100%	1000	1000	1430	1430	0	0	0	100	143	175

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

Actual Weight of Sediment Added to Replicate								
	Test Concentrations							
Replicate Number	**10%**	**20%**	**40%**	**60%**	**80%**	100%		
1	164	161	160	158	142	140		
2	166	163	159	154	140	141		
3	163	163	159	153	143	140		
Mean	164	162	159	155	142	140		

Scale: Ohaus #17
PJ400 #13

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: March 24-May 14, 2011
Test Type: Long Term Survival, Growth, and Emergance Whole Sediment Toxicity Test
Test Species: *Chironomus dilutus*

Data Entry

Date	Initials	Data Entry
3/28/11	DS	day 0-3
3/29/2011	DS	day 4
3/31/11	DS	day 5-6
4/1/2011	EB	day 7-8
4/4/11	ds	day 9-11
4/6/2011	eb	day 12-13
4/7/11	NS	day 14
4/11/2011	eb	day 15-17
4/14/11	NS	days 18-34
5/3/2011	eb	day 35-39
5/12/11	eb	days 40-48 (or when sediment ended)
5/20/2011	AS	day 49-51
5/20/11	AS	survival for day 20 takedown

QC data

4/1/11	eb	days 0-6
4/1/2011	NS	days 7-8
4/6/11	eb	day 9-11
4/7/2011	NS	days 12-13
4/28/2011	AS	days 14-32
5/12/2011	AS	days 33-45
5/20/2011	AS	days 45-end

10% QC

5/31/2011	AD	days 0-51

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: GLW- Water Only Exposure

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.96	8.0	305.0	114	132	0.17		
		22.7	8.02	8.0	303.0					
25-Mar-11	1	22.8	7.65	6.3						
		22.7	7.74	6.8						
26-Mar-11	2	22.7								
		22.7								
27-Mar-11	3	22.6								
		22.6								
28-Mar-11	4	22.8	7.61	6.9	301.0					
		22.8	7.66	6.8	302.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.0	7.63	6.4						
		23.0	7.69	4.8						
31-Mar-11	7	23.0		6.5						
		23.2		6.0						
1-Apr-11	8	22.9	7.64	4.5						
		23.0	7.60	4.7						
2-Apr-11	9	23.3		5.3						
		23.3		4.9						
3-Apr-11	10	23.1		6.7						
		23.1		6.4						
4-Apr-11	11	23.2	7.90	6.0	303.0					
		23.2	8.02	6.4	303.0					
5-Apr-11	12	23.0		6.5						
		23.1		5.8						
6-Apr-11	13	23.3	7.87	5.2						
		23.4	7.94	6.0						
7-Apr-11	14	23.0		5.8						
		23.1		6.0						
8-Apr-11	15	23.2	7.56	4.6						
		23.2	7.62	4.8						
9-Apr-11	16	23.2		2.6						
		23.2		4.9						
10-Apr-11	17	22.7		6.3						
		22.7		6.0						
11-Apr-11	18	23.6	8.07	6.8	296.0					
		23.6	8.03	6.7	297.4					
12-Apr-11	19	23.6		6.5						
		23.6		6.8						
13-Apr-11	20	22.3	7.62	4.1	306.0			0.10		
		23.0	7.53	4.7	302.0					
		23.1	7.48	3.6	304.0					
		22.3	7.58		306.0					
		22.2	7.59	3.7	302.0					
		22.2	7.55	3.9	302.0					
14-Apr-11	21	23.0		5.7						
		23.0		5.8						
15-Apr-11	22	22.9	7.49	4.7						
		23.0	7.55	5.2						
16-Apr-11	23	23.0		5.3						
		23.0		6.5						
17-Apr-11	24	22.5		6.5						
		22.8		6.1						
18-Apr-11	25	22.8	7.72	6.6	302.0					
		22.8	7.75	7.3	304.0					
19-Apr-11	26	22.8		6.0						
		22.9		6.1						
20-Apr-11	27	23.0	7.61	6.0						
		23.0	7.72	6.0						
21-Apr-11	28	23.0		6.5						
		23.0		6.2						
22-Apr-11	29	22.6	7.64	5.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: GLW- Water Only Exposure

Test Dates: March 24-May 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
		22.6	7.66	5.4						
23-Apr-11	30	23.0		4.8						
		23.1		4.5						
24-Apr-11	31	23.0		5.3						
		23.0		4.2						
25-Apr-11	32	22.7	7.69	5.4	302.0					
		22.7	7.62	4.2	301.0					
26-Apr-11	33	22.9		4.9						
		22.9		4.3						
27-Apr-11	34	23.0	7.54	5.0						
		23.0	7.60	5.2						
28-Apr-11	35	23.0		4.5						
		23.0		4.4						
29-Apr-11	36	22.7	7.68	5.2						
		22.8	7.59	4.2						
30-Apr-11	37	22.8		4.6						
		22.8		4.5						
1-May-11	38	22.8		3.9						
		22.8		4.0						
2-May-11	39	22.6	7.50	5.1	297.3					
		22.6	7.61	4.4	299.3					
3-May-11	40	22.5		4.6						
		22.5		5.6						
4-May-11	41	22.7	7.39	4.6						
		22.7	7.35	4.3						
5-May-11	42	22.8		3.6						
		22.7		3.1						
6-May-11	43	23.1	7.50	3.6						
		23.1	7.58	3.8						
7-May-11	44	22.9		4.1						
		22.9		5.1						
8-May-11	45	22.9		4.6						
		22.9		4.1						
9-May-11	46	23.0	7.56	3.9	299.0					
		22.8	7.64	4.4	299.1					
10-May-11	47	23.0		4.3						
		23.0		3.6						
11-May-11	48	22.9	7.57	4.0	303.0	104	136	0.00	U	
	sediment ended	22.9	7.60	4.5	301.0					
Mean		**22.9**	**7.66**	**5.2**	**302**	**109**	**134**	**0.09**		
Number		**102**	**48**	**95**	**24**	**2**	**2**	**3**		
Max #		**23.6**	**8.07**	**8.0**	**306**	**114**	**136**	**0.17**		
Min#		**22.2**	**7.35**	**2.6**	**296**	**104**	**132**	**0.00**		

Replicate	2	6	9	11
20 day # Surviving	10	11	12	12
Weight-AFDW (mg)	0.86667	0.88363	0.71500	0.69000
Biomass-AFDW (mg)	0.70909	0.81000	0.71500	0.69000

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

20-Day Percent Survival	93.8
Avg. Weight-AFDW (mg)	0.78883
Avg. Biomass-AFDW (mg)	0.73102

Replicate	1	3	4	5	7	8	10	12
Number of Pupae and Live Emerged at Test Termination	10	12	12	10	12	6	5	12
Number of Live Emerged	10	12	12	10	12	6	5	12

Partial Life Cycle	
Survival	82.3
Percent Emerged	82.3

* red outline indicates corrected data entry error

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: LCS+GLW Lab Control Sediment

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.57	6.4	382.0	138	164	0.22		
		22.7	7.54	6.5	398.0					
25-Mar-11	1	22.7	7.62	5.5						
		22.7	7.64	6.0						
26-Mar-11	2	22.6								
		22.7								
27-Mar-11	3	22.6								
		22.6								
28-Mar-11	4	22.9	7.61	6.4	328.0					
		22.9	7.61	6.3	326.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.0	7.60	3.9						
		23.0	7.59	3.9						
31-Mar-11	7	23.2		4.7						
		23.2		4.4						
1-Apr-11	8	23.0	7.60	4.5						
		23.0	7.69	4.6						
2-Apr-11	9	23.3		3.6						
		23.3		3.3						
3-Apr-11	10	23.1		3.3						
		23.1		3.7						
4-Apr-11	11	23.1	7.85	3.9	339.0					
		23.1	7.81	3.7	335.0					
5-Apr-11	12	23.0		4.1						
		23.1		3.4						
6-Apr-11	13	23.3	7.66	3.2						
		23.3	7.71	3.7						
7-Apr-11	14	23.1		3.1						
		23.1		3.9						
8-Apr-11	15	23.2	7.56	2.7						
		23.2	7.57	3.1						
9-Apr-11	16	23.4		**TE**						
		23.3		**TE**						
10-Apr-11	17	22.8		2.6						
		22.7		2.7						
11-Apr-11	18	23.6	7.60	3.7	299.5					
		23.6	7.61	3.9	304.0					
12-Apr-11	19	23.6		3.3						
		23.5		3.0						
13-Apr-11	20	22.0	7.37	1.7	315.0			0.07	J	
		23.0	7.41	1.7	324.0					
		23.1	7.35	1.8	308.0					
		22.1	7.47	2.4	315.0					
		21.7	7.52	2.7	316.0					
14-Apr-11	21	22.8		3.1						
		22.9		2.9						
15-Apr-11	22	22.9	7.53	4.0						
		22.9	7.47	3.9						
16-Apr-11	23	22.8		4.4						
		22.9		3.4						
17-Apr-11	24	22.7		3.7						
		22.8		3.3						
18-Apr-11	25	22.8	7.61	5.8	307.0					
		22.8	7.47	4.3	307.0					
19-Apr-11	26	22.7		5.3						
		22.9		4.9						
20-Apr-11	27	22.7	7.46	4.4						
		22.8	7.51	4.4						
21-Apr-11	28	23.0		4.2						
		23.0		4.0						
22-Apr-11	29	22.6	7.48	4.0						
		22.6	7.54	4.2						
23-Apr-11	30	23.0		4.5						
		22.8		3.7						
24-Apr-11	31	22.8		3.0						
		22.9		2.9						
25-Apr-11	32	22.6	7.51	3.2	302.0					
		22.6	7.57	3.9	307.0					
26-Apr-11	33	22.8		3.2						
		22.8		3.5						
27-Apr-11	34	22.7	7.39	2.7						
		22.7	7.47	3.6						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: LCS+GLW Lab Control Sediment

Test Dates: March 24-May 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
28-Apr-11	35	22.8		2.5						
		22.8		3.1						
29-Apr-11	36	22.6	7.52	4.1						
		22.6	7.49	3.4						
30-Apr-11	37	22.7		2.8						
		22.7		3.7						
1-May-11	38	22.6		3.5						
		22.7		2.2						
2-May-11	39	22.5	7.49	3.7	283.0					
		22.5	7.47	3.7	284.2					
3-May-11	40	22.5		3.2						
		22.5		3.5						
4-May-11	41	22.7	7.25	3.3						
		22.7	7.28	3.0						
5-May-11	42	22.5		3.0						
		22.5		2.5						
6-May-11	43	23.0	7.58	2.8						
		23.0	7.54	2.8						
7-May-11	44	22.8		3.0						
		22.9		2.9						
8-May-11	45	22.8		2.9						
		22.8		3.0						
9-May-11	46	22.5	7.68	3.1	312.0					
		22.5	7.54	3.4	302.0					
10-May-11	47	23.0		2.9						
		23.0		2.8						
11-May-11	48	23.0	7.61	4.0	304.0	108	148	0.00	U	
	sediment ended	23.0	7.66	3.7	302.0					
Mean		**22.9**	**7.55**	**3.6**	**317**	**123**	**156**	**0.10**		
Number		**101**	**47**	**93**	**23**	**2**	**2**	**3**		
Max #		**23.6**	**7.85**	**6.5**	**398**	**138**	**164**	**0.22**		
Min#		**21.7**	**7.25**	**1.7**	**283**	**108**	**148**	**0.00**		

Replicate	1	3	6	9
20 day # Surviving	12	12	9	11
Weight-AFDW (mg)	1.54667	1.64667	1.44222	1.39364
Biomass-AFDW (mg)	1.54667	1.64667	1.08167	1.27750

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

20-Day Percent Survival	91.7
Avg. Weight-AFDW (mg)	1.50730
Avg. Biomass-AFDW (mg)	1.38813

Replicate	2	4	5	7	8	10	11	12
Number of Pupae and Live Emerged at Test Termination	12	8	10	9	9	8	8	10
Number of Live Emerged	12	8	9	9	9	8	8	10

Partial Life Cycle	
Survival	77.1
Percent Emerged	76.0

TE = Technician Error

Project Name: Tennessee Valley Authority (TVA)

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

Test Dates: March 24-May 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
24-Mar-11	0	22.0	7.80	6.3	352.0	120	148	0.24		
		22.0	7.94	6.7	316.0					
25-Mar-11	1	22.9	7.70	7.3						
		22.9	7.59	5.5						
26-Mar-11	2	22.7								
		22.7								
27-Mar-11	3	22.8								
		22.7								
28-Mar-11	4	22.8	7.59	5.8	326.0					
		22.8	7.65	5.8	321.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.53	4.3						
		22.6	7.57	4.4						
31-Mar-11	7	22.8		4.5						
		22.8		4.3						
1-Apr-11	8	22.6	7.53	4.0						
		22.6	7.56	3.9						
2-Apr-11	9	22.8		4.6						
		22.8		2.8						
3-Apr-11	10	22.8		4.4						
		22.8		5.1						
4-Apr-11	11	22.9	7.75	2.8	332.0					
		22.9	7.71	2.8	332.0					
5-Apr-11	12	22.9		3.4						
		22.9		2.6						
6-Apr-11	13	23.2	7.67	2.6						
		23.2	7.69	2.9						
7-Apr-11	14	23.0		3.6						
		23.0		2.6						
8-Apr-11	15	23.0	7.57	2.5						
		23.0	7.63	2.8						
9-Apr-11	16	23.6		1.3						
		23.6		2.0						
10-Apr-11	17	23.4		2.8						
		23.2		2.5						
11-Apr-11	18	23.6	7.65	4.0	298.7					
		23.6	7.54	3.0	298.0					
12-Apr-11	19	23.3		4.2						
		23.2		3.0						
13-Apr-11	20	23.0	7.45	2.0	277.1			0.06	J	
		23.1	7.38	2.2	279.9					
			7.46	1.9	280.8					
			7.47	1.8	286.7					
14-Apr-11	21	22.9		2.5						
		22.9		2.7						
15-Apr-11	22	22.9	7.43	3.1						
		22.9	7.49	3.1						
16-Apr-11	23	23.1		4.3						
		23.0		3.0						
17-Apr-11	24	22.6		3.1						
		22.6		2.9						
18-Apr-11	25	22.8	7.48	4.1	307.0					
		22.7	7.68	5.9	309.0					
19-Apr-11	26	22.6		2.6						
		22.7		2.7						
20-Apr-11	27	23.1	7.47	3.7						
		23.1	7.50	3.9						
21-Apr-11	28	23.1		3.5						
		23.1		3.9						
22-Apr-11	29	22.4	7.68	4.1						
		22.5	7.70	4.8						
23-Apr-11	30	22.8		3.0						

Project Name: Tennessee Valley Authority (TVA)

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

Test Dates: March 24-May 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
		22.8		3.1						
24-Apr-11	31	23.0		2.8						
		23.1		2.6						
25-Apr-11	32	23.2	7.55	3.5	298.5					
		23.1	7.69	3.9	301.0					
26-Apr-11	33	23.0		3.1						
		23.0		3.7						
27-Apr-11	34	22.8	7.54	2.9						
		22.8	7.46	2.5						
28-Apr-11	35	22.7		3.1						
		22.7		3.6						
29-Apr-11	36	22.6	7.62	3.8						
		22.7	7.58	4.2						
30-Apr-11	37	22.8		3.7						
		22.8		3.4						
1-May-11	38	22.8		3.1						
		22.9		3.1						
2-May-11	39	22.4	7.74	4.1	283.3					
		22.4	7.59	3.6	275.3					
3-May-11	40	22.7		3.3						
		22.7		4.0						
4-May-11	41	22.9	7.52	3.0						
		22.8	7.59	3.4						
5-May-11	42	22.7		3.6						
		22.7		3.4						
6-May-11	43	22.9	7.41	3.0						
		22.9	7.58	3.4						
7-May-11	44	22.8		2.0						
		22.7		3.5						
8-May-11	45	22.7		2.6						
		22.7		2.7						
9-May-11	46	22.8	7.54	3.0	274.3	114	136	0.04	J	
	sediment ended	22.8	7.59	3.9	273.9					
Mean		**22.9**	**7.59**	**3.5**	**301**	**117**	**142**	**0.11**		
Number		**94**	**44**	**90**	**20**	**2**	**2**	**3**		
Max #		**23.6**	**7.94**	**7.3**	**352**	**120**	**148**	**0.24**		
Min#		**22.0**	**7.38**	**1.3**	**274**	**114**	**136**	**0.04**		

Replicate	2	7	10	11
20 days # Surviving	10	10	10	12
Weight-AFDW (mg)	1.21100	1.27800	1.04800	0.82333
Biomass-AFDW (mg)	1.00917	1.06500	0.87333	0.82333

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

20-Day Percent Survival 87.5
Avg. Weight-AFDW (mg) 1.09008
Avg. Biomass-AFDW (mg) 0.94271

Replicate	1	3	4	5	6	8	9	12
Number of Pupae and Live Emerged at Test Termination	8	9	10	11	11	9	6	8
Number of Live Emerged	8	9	10	11	11	9	6	8

Partial Life Cycle
Survival 75.0
Percent Emerged 75.0

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRS(8897)+CRW

Test Dates: March 24-May 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
24-Mar-11	0	22.0	7.83	6.7	309.0	126	140	0.50		
		22.0	7.82	6.6	319.0					
25-Mar-11	1	22.9	7.73	6.7						
		22.8	7.86	6.2						
26-Mar-11	2	22.7								
		22.7								
27-Mar-11	3	22.7								
		22.8								
28-Mar-11	4	22.9	7.67	6.2	311.0					
		22.9	7.67	6.1	311.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.60	4.4						
		22.6	7.62	4.4						
31-Mar-11	7	22.8		4.4						
		22.8		4.4						
1-Apr-11	8	22.6	7.52	3.9						
		22.7	7.55	3.9						
2-Apr-11	9	22.7		4.0						
		22.7		3.8						
3-Apr-11	10	22.8		6.1						
		22.7		6.7						
4-Apr-11	11	22.9	7.71	4.6	311.0					
		22.9	7.74	4.9	308.0					
5-Apr-11	12	22.9		5.4						
		22.9		4.4						
6-Apr-11	13	23.2	7.95	5.4						
		23.2	7.97	3.6						
7-Apr-11	14	23.0		3.5						
		23.0		3.8						
8-Apr-11	15	23.0	7.78	4.3						
		23.0	7.74	4.3						
9-Apr-11	16	23.6		3.3						
		23.4		2.9						
10-Apr-11	17	23.1		4.5						
		23.1		4.0						
11-Apr-11	18	23.6	7.94	5.6	299.1					
		23.6	7.87	5.2	299.6					
12-Apr-11	19	23.3		5.4						
		23.3		5.4						
13-Apr-11	20	22.9	7.62	3.6	277.6			0.01	U	
		22.9	7.60	3.0	280.1					
			7.52	4.0	277.3					
			7.48	3.5	276.5					
14-Apr-11	21	22.9		4.9						
		22.9		4.7						
15-Apr-11	22	22.9	7.49	4.1						
		22.9	7.55	4.5						
16-Apr-11	23	23.0		4.0						
		23.0		4.1						
17-Apr-11	24	22.6		4.8						
		22.6		4.4						
18-Apr-11	25	22.7	7.74	5.0	311.0					
		22.7	7.80	5.8	313.0					
19-Apr-11	26	22.8		4.2						
		22.9		3.8						
20-Apr-11	27	23.1	7.82	5.5						
		23.2	7.79	4.8						
21-Apr-11	28	23.1		5.5						
		23.1		6.1						
22-Apr-11	29	22.6	7.77	3.6						
		22.7	7.80	3.5						
23-Apr-11	30	23.0		3.9						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRS(8897)+CRW

Test Dates: March 24-May 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
		23.0		5.3						
24-Apr-11	31	23.1		3.9						
		23.2		4.0						
25-Apr-11	32	22.9	7.90	4.6	300.0					
		22.9	7.88	4.2	303.0					
26-Apr-11	33	23.0		4.8						
		23.0		4.2						
27-Apr-11	34	22.8	7.80	4.5						
		22.9	7.76	3.6						
28-Apr-11	35	22.7		4.5						
		22.7		4.4						
29-Apr-11	36	22.8	7.66	3.2						
		22.8	7.81	3.6						
30-Apr-11	37	23.0		5.2						
		23.0		3.7						
1-May-11	38	23.0		3.7						
		23.0		3.3						
2-May-11	39	22.5	7.59	4.8	286.5					
		22.6	7.80	4.6	286.0					
3-May-11	40	22.6		3.9						
		22.7		4.1						
4-May-11	41	22.9	7.65	3.6						
		22.8	7.76	3.4						
5-May-11	42	22.7		3.0						
		22.7		3.2						
6-May-11	43	22.9	7.84	3.7						
		22.9	7.70	3.4						
7-May-11	44	22.7		4.0						
		22.8		3.7						
8-May-11	45	22.7		3.0						
		22.8		3.3						
9-May-11	46	22.4	7.53	3.6	286.8					
		22.4	7.73	3.7	278.4					
10-May-11	47	22.7	7.64	4.0	280.6	108	136	0.06	J	
	sediment ended	22.7	7.71	4.2	276.4					
Mean		**22.9**	**7.72**	**4.4**	**295**	**117**	**138**	**0.19**		
Number		**96**	**46**	**92**	**22**	**2**	**2**	**3**		
Max #		**23.6**	**7.97**	**6.7**	**319**	**126**	**140**	**0.50**		
Min#		**22.0**	**7.48**	**2.9**	**276**	**108**	**136**	**0.01**		

Replicate	3	4	5	10
20 days # Surviving	12	12	9	11
Weight-AFDW (mg)	0.77000	0.91167	1.25222	1.04909
Biomass-AFDW (mg)	0.77000	0.91167	0.93917	0.96167

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

20-Day Percent Survival 91.7
Avg. Weight-AFDW (mg) 0.99575
Avg. Biomass-AFDW (mg) 0.89563

Replicate	1	2	6	7	8	9	11	12
Number of Pupae and Live Emerged at Test Termination	12	10	10	6	7	12	7	11
Number of Live Emerged	12	10	10	6	7	12	7	11

Partial Life Cycle
Survival 78.1
Percent Emerged 78.1

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 10%

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.70	6.5	315.0	138	160	0.24		
		22.7	7.73	6.5	314.0					
25-Mar-11	1	22.8	7.74	6.2						
		22.7	7.77	6.7						
26-Mar-11	2	22.5								
		22.5								
27-Mar-11	3	22.5								
		22.6								
28-Mar-11	4	22.9	7.62	6.0	307.0					
		22.8	7.64	6.2	310.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.0	7.59	5.2						
		23.0	7.64	4.9						
31-Mar-11	7	23.0		4.9						
		23.1		4.9						
1-Apr-11	8	23.0	7.65	4.5						
		23.0	7.61	4.1						
2-Apr-11	9	23.3		4.1						
		23.3		4.5						
3-Apr-11	10	23.1		5.2						
		23.1		5.6						
4-Apr-11	11	23.2	8.00	5.6	316.0					
		23.2	7.99	5.7	315.0					
5-Apr-11	12	23.2		5.7						
		22.9		4.9						
6-Apr-11	13	23.3	7.98	5.1						
		23.3	8.00	4.8						
7-Apr-11	14	23.1		5.7						
		23.2		4.8						
8-Apr-11	15	23.1	7.93	4.1						
		23.1	7.96	4.1						
9-Apr-11	16	23.3		4.6						
		23.2		3.5						
10-Apr-11	17	22.6		5.2						
		22.7		4.6						
11-Apr-11	18	23.7	8.10	5.5	303.0					
		23.7	8.17	5.6	307.0					
12-Apr-11	19	23.5		4.8						
		23.5		5.2						
13-Apr-11	20	23.0	7.73	3.7	292.9			0.24		
		23.0	7.72	3.8	291.4					
		22.3	7.79	3.7	294.0					
		22.6	7.88	4.2	293.2					
		22.3	7.79	5.3	290.1					
14-Apr-11	21	23.1		6.0						
		23.0		6.0						
15-Apr-11	22	23.0	7.52	4.5						
		22.9	7.69	4.7						
16-Apr-11	23	22.7		5.8						
		22.9		4.4						
17-Apr-11	24	22.6		4.3						
		22.6		4.2						
18-Apr-11	25	22.7	7.90	6.5	313.0					
		22.7	7.87	6.2	320.0					
19-Apr-11	26	22.7		5.1						
		22.8		4.5						
20-Apr-11	27	22.8	7.85	6.2						
		22.8	7.78	5.3						
21-Apr-11	28	22.8		5.0						
		22.8		6.0						
22-Apr-11	29	22.6	7.83	5.2						
		22.7	7.91	5.5						
23-Apr-11	30	22.8		4.2						
		22.8		4.3						
24-Apr-11	31	22.8		4.0						
		22.8		3.9						
25-Apr-11	32	22.6	7.81	3.6	310.0					
		22.7	7.88	5.0	297.7					
26-Apr-11	33	22.7		4.0						
		22.7		3.7						
27-Apr-11	34	22.9	7.68	3.5						
		22.9	7.77	4.7						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 10%

Test Dates: March 24-May 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
28-Apr-11	35	22.7		4.0						
		22.7		4.8						
29-Apr-11	36	22.5	7.86	5.1						
		22.5	7.83	4.4						
30-Apr-11	37	22.7		4.4						
		22.7		4.4						
1-May-11	38	22.6		3.7						
		22.7		3.7						
2-May-11	39	22.5	7.68	3.7	282.7					
		22.5	7.75	3.7	285.7					
3-May-11	40	22.5		4.0						
		22.5		4.2						
4-May-11	41	22.6	7.64	3.8						
		22.6	7.61	4.0						
5-May-11	42	22.7		3.7						
		22.7		4.2						
6-May-11	43	23.0	7.69	3.1						
		23.0	7.74	3.1						
7-May-11	44	22.8		3.4						
		22.8		3.5						
8-May-11	45	22.8		2.6						
		22.8		3.8						
9-May-11	46	22.8	7.62	3.5	277.8	114	144	0.02	U	
	sediment ended	22.8	7.67	4.0	280.2					
Mean		**22.9**	**7.78**	**4.7**	**301**	**126**	**152**	**0.16**		
Number		**97**	**45**	**91**	**21**	**2**	**2**	**3**		
Max #		**23.7**	**8.17**	**6.7**	**320**	**138**	**160**	**0.24**		
Min#		**22.3**	**7.52**	**2.6**	**278**	**114**	**144**	**0.02**		

Replicate	3	8	10	12
20 days # Surviving	12	12	12	12
Weight-AFDW (mg)	0.81833	1.23600	0.95417	1.09455
Biomass-AFDW (mg)	0.81833	1.23600	0.95417	1.09455

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

20-Day Percent Survival	100.0
Avg. Weight-AFDW (mg)	1.02576
Avg. Biomass-AFDW (mg)	1.02576

Replicate	1	2	4	5	6	7	9	11
Number of Pupae and Live Emerged at Test Termination	11	12	9	9	9	6	12	12
Number of Live Emerged	9	12	9	8	9	4	12	12

Partial Life Cycle	
Survival	83.3
Percent Emerged	78.1

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 20%

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.74	6.7	315.0	124	140	0.36		
		22.7	7.74	6.7	314.0					
25-Mar-11	1	22.6	7.77	6.0						
		22.6	7.73	6.0						
26-Mar-11	2	22.6								
		22.6								
27-Mar-11	3	22.6								
		22.6								
28-Mar-11	4	22.9	7.64	6.0	308.0					
		22.9	7.64	6.0	310.0					
29-Mar-11	5	23.0								
		23.1								
30-Mar-11	6	23.0	7.67	5.3						
		23.0	7.62	4.9						
31-Mar-11	7	23.1		5.1						
		23.1		4.8						
1-Apr-11	8	23.0	7.58	4.5						
		23.0	7.62	4.5						
2-Apr-11	9	23.3		3.8						
		23.3		4.4						
3-Apr-11	10	23.1		6.4						
		23.1		6.4						
4-Apr-11	11	23.2	7.97	5.2	314.0					
		23.2	8.02	5.4	315.0					
5-Apr-11	12	22.8		5.9						
		22.9		5.0						
6-Apr-11	13	23.3	8.07	5.5						
		23.3	8.08	5.3						
7-Apr-11	14	23.2		5.5						
		23.2		4.0						
8-Apr-11	15	23.1	7.97	5.3						
		23.1	8.05	4.2						
9-Apr-11	16	23.3		4.9						
		23.2		4.0						
10-Apr-11	17	22.7		5.6						
		22.8		5.0						
11-Apr-11	18	23.7	8.20	5.7	307.0					
		23.7	8.16	5.4	306.0					
12-Apr-11	19	23.6		5.4						
		23.6		5.4						
13-Apr-11	20	23.0	7.72	3.6	289.1			0.00	U	
		23.0	7.76	3.5	292.3					
		22.2	7.96	5.0	296.2					
		22.5	7.84	3.9	287.5					
		22.4	7.85	3.8	290.3					
		22.5	7.88	3.8	292.3					
14-Apr-11	21	22.9		5.0						
		22.9		4.6						
15-Apr-11	22	22.9	7.80	4.7						
		22.9	7.79	4.9						
16-Apr-11	23	23.0		5.1						
		23.0		5.0						
17-Apr-11	24	22.5		5.1						
		22.7		4.9						
18-Apr-11	25	22.6	7.75	6.0	311.0					
		22.7	7.90	5.8	318.0					
19-Apr-11	26	22.7		5.2						
		22.8		4.9						
20-Apr-11	27	22.7	7.81	5.4						
		22.7	7.77	4.7						
21-Apr-11	28	22.8		6.0						
		22.8		6.0						
22-Apr-11	29	22.6	7.86	5.6						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 20%

Test Dates: March 24-May 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
		22.7	7.87	5.6						
23-Apr-11	30	23.0		3.7						
		22.8		5.1						
24-Apr-11	31	22.8		4.2						
		22.8		4.1						
25-Apr-11	32	22.8	7.93	5.0	303.0					
		22.8	7.77	4.0	301.0					
26-Apr-11	33	22.8		4.0						
		22.8		4.6						
27-Apr-11	34	22.7	7.74	3.5						
		22.7	7.78	3.5						
28-Apr-11	35	22.6		4.5						
		22.6		3.4						
29-Apr-11	36	22.6	7.82	5.0						
		22.7	7.85	4.9						
30-Apr-11	37	22.7		4.6						
		22.7		5.1						
1-May-11	38	22.9		3.4						
		22.8		4.7						
2-May-11	39	22.5	7.81	4.8	283.6					
		22.5	7.77	4.1	285.9					
3-May-11	40	22.4		4.2						
		22.4		3.5						
4-May-11	41	22.7	7.58	4.7						
		22.7	7.69	4.1						
5-May-11	42	22.7		2.6						
		22.7		3.8						
6-May-11	43	23.0	7.78	3.4						
		23.0	7.64	2.8						
7-May-11	44	22.8		3.9						
		22.8		2.6						
8-May-11	45	23.0		2.8						
		23.0		3.8						
9-May-11	46	22.5	7.72	3.4	282.4					
		22.6	7.71	3.7	282.0					
10-May-11	47	22.9		3.2						
		23.0		3.7						
11-May-11	48	21.9	7.81	4.2	281.9	108	136	0.01	U	
	sediment ednded	22.1	7.89	4.3	281.5					
Mean		**22.8**	**7.82**	**4.7**	**299**	**116**	**138**	**0.12**		
Number		**102**	**48**	**96**	**24**	**2**	**2**	**3**		
Max #		**23.7**	**8.20**	**6.7**	**318**	**124**	**140**	**0.36**		
Min#		**21.9**	**7.58**	**2.6**	**282**	**108**	**136**	**0.00**		

Replicate	6	9	11	12
20 days # Surviving	12	10	11	12
Weight-AFDW (mg)	1.03600	0.97900	1.03818	0.92750
Biomass-AFDW (mg)	1.03600	0.81583	0.95167	0.92750

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

20-Day Percent Survival 93.8
Avg. Weight-AFDW (mg) 0.99517
Avg. Biomass-AFDW (mg) 0.93275

Replicate	1	2	3	4	5	7	8	10
Number of Pupae and Live Emerged at Test Termination	9	11	10	9	7	10	9	10
Number of Live Emerged	8	10	9	9	6	10	7	10

Partial Life Cycle
Survival 78.1
Percent Emerged 71.9

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 40%

Test Dates: March 24-May 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
24-Mar-11	0	22.5	7.77	6.8	308.0	120.00	136	0.47		
		22.5	7.78	6.6	309.0					
25-Mar-11	1	22.6	7.72	5.9						
		22.7	7.71	5.8						
26-Mar-11	2	22.7								
		22.7								
27-Mar-11	3	22.6								
		22.6								
28-Mar-11	4	22.9	7.66	6.1	305.0					
		22.9	7.68	6.1	308.0					
29-Mar-11	5	23.0								
		23.0								
30-Mar-11	6	23.0	7.60	4.8						
		23.0	7.60	4.8						
31-Mar-11	7	23.1		5.2						
		23.2		5.0						
1-Apr-11	8	23.0	7.64	5.0						
		23.0	7.63	4.7						
2-Apr-11	9	23.2		4.7						
		23.2		5.6						
3-Apr-11	10	23.1		5.3						
		23.1		5.6						
4-Apr-11	11	23.2	8.01	5.4	311.0					
		23.2	8.06	5.9	313.0					
5-Apr-11	12	22.8		5.5						
		22.8		5.7						
6-Apr-11	13	23.3	8.06	5.3						
		23.3	8.04	5.4						
7-Apr-11	14	23.2		4.9						
		23.2		4.5						
8-Apr-11	15	23.1	7.89	3.8						
		23.1	8.04	5.3						
9-Apr-11	16	23.3		3.6						
		23.3		3.8						
10-Apr-11	17	22.7		3.9						
		22.8		4.6						
11-Apr-11	18	23.8	7.93	4.3	310.0					
		23.7	7.94	4.4	310.0					
12-Apr-11	19	23.4		5.5						
		23.5		5.5						
13-Apr-11	20	23.1	7.64	3.7	293.7			0.01	U	
		23.1	7.75	3.7	288.7					
		23.2	7.80	4.3	290.9					
		23.1	7.71	3.6	285.6					
		23.3	7.79	3.7	291.5					
		23.3	7.82	4.4	288.2					
14-Apr-11	21	22.9		4.8						
		22.8		4.3						
15-Apr-11	22	22.7	7.81	5.0						
		22.7	7.76	4.7						
16-Apr-11	23	23.0		5.5						
		23.1		5.6						
17-Apr-11	24	22.6		6.1						
		22.7		5.7						
18-Apr-11	25	22.8	7.86	6.2	320.0					
		22.8	7.86	6.6	316.0					
19-Apr-11	26	22.7		5.6						
		22.7		5.2						
20-Apr-11	27	22.8	7.83	4.9						
		22.9	7.83	5.5						
21-Apr-11	28	22.8		6.2						
		22.8		5.5						
22-Apr-11	29	22.7	7.84	5.1						
		22.7	7.92	4.7						
23-Apr-11	30	22.8		3.8						
		22.8		4.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 40%

Test Dates: March 24-May 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
24-Apr-11	31	22.8		3.5						
		22.9		4.5						
25-Apr-11	32	22.8	7.68	3.5	303.0					
		22.8	7.78	3.6	303.0					
26-Apr-11	33	22.9		4.8						
		22.9		4.1						
27-Apr-11	34	22.8	7.68	3.3						
		22.8	7.68	3.5						
28-Apr-11	35	22.7		4.8						
		22.7		4.5						
29-Apr-11	36	22.7	7.67	4.4						
		22.7	7.69	4.4						
30-Apr-11	37	22.7		4.3						
		22.8		4.9						
1-May-11	38	23.1		4.2						
		23.0		3.8						
2-May-11	39	22.6	7.74	4.5	283.2					
		22.6	7.73	4.2	284.1					
3-May-11	40	22.4		4.7						
		22.4		4.3						
4-May-11	41	22.7	7.68	3.9						
		22.7	7.68	4.4						
5-May-11	42	22.7		4.6						
		22.7		4.4						
6-May-11	43	23.0	7.72	4.1						
		23.0	7.81	3.5						
7-May-11	44	22.8		3.8						
		22.8		4.4						
8-May-11	45	22.9		4.2						
		22.9		3.8						
9-May-11	46	22.6	7.78	4.5	278.0					
		22.6	7.78	3.8	278.0					
10-May-11	47	22.8	7.70	4.0	276.9	110.00	128	0.02	U	
	sediment ended	22.8	7.67	4.0	276.6					
Mean		**22.9**	**7.78**	**4.7**	**297**	**115**	**132**	**0.17**		
Number		**100**	**48**	**94**	**24**	**2**	**2**	**3**		
Max #		**23.8**	**8.06**	**6.8**	**320**	**120**	**136**	**0.47**		
Min#		**22.4**	**7.60**	**3.3**	**277**	**110**	**128**	**0.01**		

Replicate	1	4	10	11
20 days # Surviving	12	12	12	10
Weight-AFDW (mg)	0.95000	0.85417	0.97500	1.01300
Biomass-AFDW (mg)	0.95000	0.85417	0.97500	0.84417

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

20-Day Percent Survival	95.8
Avg. Weight-AFDW (mg)	0.94804
Avg. Biomass-AFDW (mg)	0.90584

Replicate	2	3	5	6	7	8	9	12
Number of Pupae and Live Emerged at Test Termination	12	10	5	12	8	9	9	8
Number of Live Emerged	12	9	5	12	8	9	9	8

Partial Life Cycle	
Survival	76.0
Percent Emerged	75.0

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 60%

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.59	6.6	314.0	116	136	0.25		
		22.7	7.60	6.7	310.0					
25-Mar-11	1	22.6	7.71	5.9						
		22.7	7.71	5.6						
26-Mar-11	2	22.6								
		22.6								
27-Mar-11	3	22.6								
		22.7								
28-Mar-11	4	22.9	7.68	6.1	306.0					
		23.0	7.67	6.0	307.0					
29-Mar-11	5	23.0								
		23.1								
30-Mar-11	6	23.0	7.62	4.9						
		23.0	7.61	4.9						
31-Mar-11	7	23.1		5.2						
		23.1		5.0						
1-Apr-11	8	23.1	7.62	4.7						
		23.1	7.65	4.5						
2-Apr-11	9	23.2		5.4						
		23.2		5.7						
3-Apr-11	10	23.1		6.1						
		23.1		6.3						
4-Apr-11	11	23.2	7.95	5.5	344.0					
		23.2	7.94	5.5	307.0					
5-Apr-11	12	22.9		4.7						
		22.9		5.5						
6-Apr-11	13	23.3	7.86	5.4						
		23.3	7.89	5.2						
7-Apr-11	14	23.1		5.1						
		23.2		5.1						
8-Apr-11	15	23.1	7.83	3.8						
		23.1	7.90	4.3						
9-Apr-11	16	23.3		4.3						
		23.3		3.9						
10-Apr-11	17	22.8		5.1						
		22.8		5.5						
11-Apr-11	18	23.7	8.00	5.0	306.0					
		23.7	8.01	5.1	307.0					
12-Apr-11	19	23.4		5.8						
		23.4		5.6						
13-Apr-11	20	23.1	7.71	3.9	285.5			0.00	U	
		23.2	7.78	4.0	288.1					
		23.1	7.73	4.0	288.9					
		23.3	7.78	4.0	291.6					
		23.3	7.77	4.2	285.6					
		23.3	7.84	4.4	286.9					
14-Apr-11	21	22.9		4.3						
		22.9		4.9						
15-Apr-11	22	22.8	7.86	5.2						
		22.8	7.82	4.9						
16-Apr-11	23	23.0		5.8						
		23.1		5.3						
17-Apr-11	24	22.6		3.4						
		22.7		5.8						
18-Apr-11	25	22.8	7.87	6.2	310.0					
		22.8	7.82	5.3	315.0					
19-Apr-11	26	22.8		6.0						
		22.9		6.1						
20-Apr-11	27	23.0	7.75	5.5						
		23.0	7.76	5.5						
21-Apr-11	28	22.8		4.4						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 60%

Test Dates: March 24-May 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
		22.9		5.5						
22-Apr-11	29	22.7	7.83	4.2						
		22.7	7.81	4.7						
23-Apr-11	30	22.8		3.9						
		22.8		5.1						
24-Apr-11	31	22.8		3.8						
		22.8		4.0						
25-Apr-11	32	22.8	7.74	4.0	301.0					
		22.8	7.75	3.7	301.0					
26-Apr-11	33	23.0		3.7						
		23.0		4.3						
27-Apr-11	34	22.8	7.68	3.8						
		22.8	7.65	3.7						
28-Apr-11	35	22.7		4.5						
		22.7		5.0						
29-Apr-11	36	22.7	7.74	4.8						
		22.7	7.68	4.2						
30-Apr-11	37	22.8		4.6						
		22.8		4.7						
1-May-11	38	23.0		3.8						
		23.1		4.3						
2-May-11	39	22.6	7.71	4.2	280.7					
		22.6	7.69	4.3	278.5					
3-May-11	40	22.4		4.2						
		22.4		4.6						
4-May-11	41	22.8	7.59	4.4						
		22.8	7.62	3.5						
5-May-11	42	22.8		4.2						
		22.8		3.4						
6-May-11	43	23.0	7.84	2.9						
		23.0	7.72	3.5						
7-May-11	44	22.8		4.6						
		22.8		3.7						
8-May-11	45	23.1		3.8						
		23.0		3.5						
9-May-11	46	22.8	7.53	4.2	279.7	108	136	0.01	U	
	sediment ended	22.8	7.60	3.7	277.4					
Mean		**22.9**	**7.75**	**4.7**	**299**	**112**	**136**	**0.09**		
Number		**98**	**46**	**92**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.01**	**6.7**	**344**	**116**	**136**	**0.25**		
Min#		**22.4**	**7.53**	**2.9**	**277**	**108**	**136**	**0.00**		

Replicate	4	7	10	11
20 days # Surviving	11	11	12	12
Weight-AFDW (mg)	1.06636	0.84546	1.01417	0.83000
Biomass-AFDW (mg)	0.97750	0.77500	1.01417	0.83000

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

20-Day Percent Survival	95.8
Avg. Weight-AFDW (mg)	0.93900
Avg. Biomass-AFDW (mg)	0.89917

Replicate	1	2	3	5	6	8	9	12
Number of Pupae and Live Emerged at Test Termination	10	7	12	9	9	10	10	8
Number of Live Emerged	10	7	12	7	7	10	10	7

Partial Life Cycle	
Survival	78.1
Percent Emerged	72.9

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 80%

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.59	6.8	304.0	112	136	0.16		
		22.7	7.64	6.7	301.0					
25-Mar-11	1	22.7	7.70	5.8						
		22.7	7.69	6.0						
26-Mar-11	2	22.7								
		22.6								
27-Mar-11	3	22.7								
		22.6								
28-Mar-11	4	23.0	7.67	6.3	308.0					
		23.0	7.67	6.3	306.0					
29-Mar-11	5	23.0								
		23.0								
30-Mar-11	6	23.0	7.56	4.5						
		23.0	7.57	4.7						
31-Mar-11	7	23.1		5.4						
		23.1		5.1						
1-Apr-11	8	23.1	7.61	4.5						
		23.0	7.59	4.6						
2-Apr-11	9	23.2		3.7						
		23.2		4.4						
3-Apr-11	10	23.1		5.8						
		23.1		6.4						
4-Apr-11	11	23.2	7.84	4.9	303.0					
		23.2	7.95	5.4	306.0					
5-Apr-11	12	22.9		5.1						
		22.9		5.6						
6-Apr-11	13	23.3	8.02	5.6						
		23.3	7.93	4.5						
7-Apr-11	14	23.2		4.9						
		23.2		4.6						
8-Apr-11	15	23.1	7.85	4.3						
		23.1	7.83	4.0						
9-Apr-11	16	23.3		3.5						
		23.3		3.0						
10-Apr-11	17	22.9		5.0						
		22.9		4.9						
11-Apr-11	18	23.7	8.04	5.9	300.0					
		23.7	7.99	5.7	301.0					
12-Apr-11	19	23.4		6.2						
		23.4		6.3						
13-Apr-11	20	23.1	7.73	4.3	281.1			0.00	U	
		23.1	7.71	4.3	276.7					
		22.6	7.78	4.9	285.0					
		23.0	7.73	4.5	284.4					
		23.0	7.74	4.7	279.5					
		23.1	7.70	3.7	281.2					
14-Apr-11	21	22.8		4.2						
		22.8		4.5						
15-Apr-11	22	22.9	7.75	4.9						
		23.0	7.69	4.4						
16-Apr-11	23	23.0		5.0						
		23.1		5.7						
17-Apr-11	24	22.6		4.9						
		22.7		4.8						
18-Apr-11	25	22.8	7.84	5.8	307.0					
		22.8	7.77	5.1	309.0					
19-Apr-11	26	22.9		5.7						
		23.0		4.9						
20-Apr-11	27	23.0	7.71	4.9						
		23.1	7.81	5.6						
21-Apr-11	28	23.0		5.0						
		23.0		4.7						
22-Apr-11	29	22.8	7.65	4.2						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 80%

Test Dates: March 24-May 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
		22.7	7.63	4.2						
23-Apr-11	30	22.8		4.8						
		22.9		2.6						
24-Apr-11	31	22.9		3.3						
		23.0		4.2						
25-Apr-11	32	22.8	7.66	3.5	296.2					
		22.9	7.73	3.8	299.2					
26-Apr-11	33	23.0		4.6						
		23.0		4.3						
27-Apr-11	34	22.8	7.68	4.4						
		22.9	7.60	3.2						
28-Apr-11	35	22.7		4.2						
		22.7		3.9						
29-Apr-11	36	22.6	7.70	4.3						
		22.7	7.63	4.0						
30-Apr-11	37	22.8		5.3						
		22.9		4.3						
1-May-11	38	22.8		4.4						
		22.9		4.9						
2-May-11	39	22.7	7.61	3.4	274.8					
		22.7	7.74	4.9	275.0					
3-May-11	40	22.5		4.2						
		22.5		4.5						
4-May-11	41	22.8	7.68	3.5						
		22.8	7.58	4.5						
5-May-11	42	22.8		4.5						
		22.7		3.4						
6-May-11	43	23.0	7.71	3.3						
		23.1	7.68	3.4						
7-May-11	44	22.8		3.8						
		22.9		3.5						
8-May-11	45	23.0		4.8						
		23.0		3.0						
9-May-11	46	23.0	7.48	4.0	270.0	112	136	0.01	U	
	sediment ended	23.0	7.53	4.0	275.5					
Mean		**22.9**	**7.72**	**4.7**	**292**	**112**	**136**	**0.06**		
Number		**98**	**46**	**92**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.04**	**6.8**	**309**	**112**	**136**	**0.16**		
Min#		**22.5**	**7.48**	**2.6**	**270**	**112**	**136**	**0.00**		

Replicate	7	9	11	12
20 days # Surviving	12	10	12	11
Weight-AFDW (mg)	0.90083	1.26100	1.02417	1.19909
Biomass-AFDW (mg)	0.90083	1.05083	1.02417	1.09917

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

20-Day Percent Survival 93.8
Avg. Weight-AFDW (mg) 1.09627
Avg. Biomass-AFDW (mg) 1.01875

Replicate	1	2	3	4	5	6	8	10
Number of Pupae and Live Emerged at Test Termination	7	10	8	9	8	8	9	6
Number of Live Emerged	7	8	7	9	7	7	8	6

Partial Life Cycle
Survival 67.7
Percent Emerged 61.5

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 100%

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.62	6.9	297.0	108	136	0.11		
		22.7	7.63	6.9	297.0					
25-Mar-11	1	22.7	7.67	6.1						
		22.7	7.65	5.8						
26-Mar-11	2	22.6								
		22.6								
27-Mar-11	3	22.6								
		22.6								
28-Mar-11	4	23.0	7.64	6.3	305.0					
		22.9	7.67	6.4	300.0					
29-Mar-11	5	23.1								
		23.0								
30-Mar-11	6	23.1	7.58	4.3						
		23.1	7.55	4.2						
31-Mar-11	7	23.0		4.8						
		23.1		5.2						
1-Apr-11	8	23.0	7.61	4.7						
		23.0	7.65	4.9						
2-Apr-11	9	23.2		3.5						
		23.2		4.4						
3-Apr-11	10	23.1		6.0						
		23.1		6.5						
4-Apr-11	11	23.2	7.90	5.5	300.0					
		23.2	7.90	5.9	302.0					
5-Apr-11	12	22.9		5.7						
		22.9		4.3						
6-Apr-11	13	23.3	7.81	4.3						
		23.3	7.81	5.4						
7-Apr-11	14	23.2		5.3						
		23.2		5.2						
8-Apr-11	15	23.1	7.82	4.3						
		23.1	7.86	5.3						
9-Apr-11	16	23.3		2.7						
		23.3		3.0						
10-Apr-11	17	22.9		5.0						
		22.8		5.1						
11-Apr-11	18	23.7	7.94	5.4	300.0					
		23.7	7.92	5.1	300.0					
12-Apr-11	19	23.4		5.6						
		23.5		5.6						
13-Apr-11	20	23.0	7.65	3.9	276.4			0.00	U	
		23.1	7.61	3.6	280.4					
		23.1	7.67	4.1	283.3					
		23.0	7.67	3.2	276.8					
14-Apr-11	21	22.8		4.5						
		22.8		5.1						
15-Apr-11	22	22.8	7.69	4.7						
		22.8	7.75	4.5						
16-Apr-11	23	23.1		5.2						
		23.1		4.5						
17-Apr-11	24	22.9		6.0						
		22.9		6.1						
18-Apr-11	25	22.8	7.63	6.4	305.0					
		22.8	7.73	5.4	304.0					
19-Apr-11	26	22.8		5.5						
		22.8		5.9						
20-Apr-11	27	23.2	7.65	4.7						
		23.2	7.74	5.4						
21-Apr-11	28	23.0		4.5						
		23.0		4.3						
22-Apr-11	29	22.8	7.66	4.4						
		22.7	7.72	4.5						
23-Apr-11	30	23.0		4.0						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 100%

Test Dates: March 24-May 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
		23.0		5.3						
24-Apr-11	31	23.0		4.5						
		23.0		4.2						
25-Apr-11	32	22.8	7.75	4.0	300.0					
		22.8	7.69	4.1	291.5					
26-Apr-11	33	23.0		4.2						
		23.0		4.3						
27-Apr-11	34	22.8	7.58	3.0						
		22.8	7.61	3.3						
28-Apr-11	35	22.7		4.0						
		22.7		3.3						
29-Apr-11	36	22.7	7.71	4.5						
		22.7	7.64	4.2						
30-Apr-11	37	23.0		5.1						
		23.0		5.0						
1-May-11	38	23.1		3.4						
		23.1		4.3						
2-May-11	39	22.6	7.65	3.9	272.8					
		22.6	7.80	5.8	275.8					
3-May-11	40	22.5		4.2						
		22.5		4.3						
4-May-11	41	22.8	7.67	5.4						
		22.8	7.70	4.1						
5-May-11	42	22.7		3.5						
		22.7		4.6						
6-May-11	43	23.1	7.75	2.7						
		23.1	7.68	3.5						
7-May-11	44	22.8		3.9						
		22.9		3.8						
8-May-11	45	23.0		3.5						
		22.9		3.5						
9-May-11	46	22.4	7.72	3.4	277.6					
		22.3	7.74	3.6	279.2					
10-May-11	47	22.8	7.67	4.4	276.6	108	144	0.02	U	
	sediment ended	22.7	7.79	4.2	276.4					
Mean		**22.9**	**7.71**	**4.7**	**290**	**108**	**140**	**0.04**		
Number		**98**	**46**	**92**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**7.94**	**6.9**	**305**	**108**	**144**	**0.11**		
Min#		**22.3**	**7.55**	**2.7**	**273**	**108**	**136**	**0.00**		

Replicate	3	5	8	12
20 days # Surviving	10	12	12	11
Weight-AFDW (mg)	1.29600	0.94250	1.10417	1.38500
Biomass-AFDW (mg)	1.08000	0.94250	1.10417	1.25909

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

20-Day Percent Survival 93.8
Avg. Weight-AFDW (mg) 1.18192
Avg. Biomass-AFDW (mg) 1.09644

Replicate	1	2	4	6	7	9	10	11
Number of Pupae and Live Emerged at Test Termination	5	7	6	6	10	6	5	6
Number of Live Emerged	5	7	6	6	10	6	5	6

Partial Life Cycle
Survival 53.1
Percent Emerged 53.1

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 10%

Test Dates: March 24-May 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
24-Mar-11	0	22.6	7.75	6.4	312.0	124	140	0.44		
		22.7	7.77	6.5	314.0					
25-Mar-11	1	22.7	7.64	6.0						
		22.7	7.75	6.3						
26-Mar-11	2	22.6								
		22.6								
27-Mar-11	3	22.5								
		22.6								
28-Mar-11	4	22.9	7.67	6.0	308.0					
		22.9	7.68	6.4	308.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.1	7.53	4.3						
		23.1	7.52	4.5						
31-Mar-11	7	23.0		5.7						
		23.0		5.4						
1-Apr-11	8	22.8	7.49	4.7						
		22.8	7.51	4.7						
2-Apr-11	9	23.2		5.0						
		23.2		4.8						
3-Apr-11	10	23.1		5.1						
		23.1		4.7						
4-Apr-11	11	23.1	7.86	5.4	317.0					
		23.1	7.96	5.6	314.0					
5-Apr-11	12	22.9		4.5						
		22.8		4.9						
6-Apr-11	13	23.3	7.90	3.6						
		23.3	7.95	4.3						
7-Apr-11	14	23.1		5.3						
		23.1		5.6						
8-Apr-11	15	23.1	7.84	3.4						
		23.1	7.87	3.9						
9-Apr-11	16	23.4		2.4						
		23.4		2.7						
10-Apr-11	17	23.2		4.2						
		23.2		4.9						
11-Apr-11	18	23.7	8.02	4.8	307.0					
		23.7	8.06	5.0	306.0					
12-Apr-11	19	23.4		5.3						
		23.5		5.2						
13-Apr-11	20	23.0	7.82	3.6	295.8			0.00	U	
		23.0	7.66	3.5	292.4					
		23.1	7.64	3.4	290.0					
		23.1	7.77	3.8	294.1					
		23.1	7.68	4.5	294.5					
14-Apr-11	21	22.9		4.5						
		22.9		5.0						
15-Apr-11	22	22.8	7.78	5.5						
		22.7	7.76	5.1						
16-Apr-11	23	23.2		5.0						
		23.2		5.4						
17-Apr-11	24	22.8		4.4						
		22.9		4.5						
18-Apr-11	25	22.8	7.87	6.8	314.0					
		22.8	7.93	5.3	312.0					
19-Apr-11	26	23.0		4.7						
		23.0		5.2						
20-Apr-11	27	23.1	7.82	4.1						
		23.2	7.70	5.0						
21-Apr-11	28	23.1		3.5						
		23.2		4.8						
22-Apr-11	29	22.8	7.65	4.1						
		22.7	7.71	4.4						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 10%

Test Dates: March 24-May 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
23-Apr-11	30	23.1		3.6						
		23.0		3.7						
24-Apr-11	31	23.0		3.6						
		23.0		3.3						
25-Apr-11	32	22.9	7.85	3.8	308.0					
		22.9	7.82	3.5	304.0					
26-Apr-11	33	23.0		3.0						
		23.0		4.2						
27-Apr-11	34	22.7	7.72	3.4						
		22.8	7.73	3.6						
28-Apr-11	35	22.7		3.2						
		22.7		3.1						
29-Apr-11	36	22.7	7.73	3.6						
		22.7	7.75	4.1						
30-Apr-11	37	23.0		4.5						
		23.0		4.3						
1-May-11	38	23.0		3.8						
		23.0		3.3						
2-May-11	39	22.6	7.63	3.6	285.6					
		22.6	7.72	4.7	278.4					
3-May-11	40	22.5		3.3						
		22.5		3.5						
4-May-11	41	22.8	7.61	3.1						
		22.8	7.65	3.1						
5-May-11	42	22.7		3.5						
		22.7		3.3						
6-May-11	43	23.1	7.73	2.7						
		23.1	7.75	3.0						
7-May-11	44	22.8		3.4						
		22.9		3.5						
8-May-11	45	23.0		3.5						
		22.9		3.5						
9-May-11	46	22.5	7.74	3.3	282.5					
		22.6	7.70	3.2	281.7					
10-May-11	47	22.9		3.7						
		22.9		3.6						
11-May-11	48	22.8	7.74	7.8	277.7	110	128	0.72		
	sediment ended	22.8	7.83	7.8	281.3					
Mean		**22.9**	**7.75**	**4.4**	**299**	**117**	**134**	**0.39**		
Number		**101**	**47**	**95**	**23**	**2**	**2**	**3**		
Max #		**23.7**	**8.06**	**7.8**	**317**	**124**	**140**	**0.72**		
Min#		**22.5**	**7.49**	**2.4**	**278**	**110**	**128**	**0.00**		

Replicate	2	3	7	10
20 day # Surviving	12	12	10	10
Weight-AFDW (mg)	1.10273	1.06083	1.35556	1.33800
Biomass-AFDW (mg)	1.10273	1.06083	1.10909	1.11500

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

20-Day Percent Survival 91.7
Avg. Weight-AFDW (mg) 1.21428
Avg. Biomass-AFDW (mg) 1.09691

Replicate	1	4	5	6	8	9	11	12
Number of Pupae and Live Emerged at Test Termination	11	8	6	11	9	10	12	8
Number of Live Emerged	10	8	5	11	9	10	12	7

Partial Life Cycle
Survival 78.1
Percent Emerged 75.0

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 20%

Test Dates: March 24-May 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
24-Mar-11	0	22.7	7.76	6.4	316.0	124	144	0.54		
		22.7	7.74	6.3	316.0					
25-Mar-11	1	22.7	7.73	6.5						
		22.9	7.73	6.2						
26-Mar-11	2	22.6								
		22.5								
27-Mar-11	3	22.5								
		22.5								
28-Mar-11	4	22.8	7.68	6.1	308.0					
		22.8	7.69	6.1	308.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.1	7.54	4.3						
		23.1	7.60	4.3						
31-Mar-11	7	23.1		5.4						
		23.1		5.6						
1-Apr-11	8	22.8	7.53	4.6						
		22.8	7.48	4.4						
2-Apr-11	9	23.2		4.3						
		23.2		5.1						
3-Apr-11	10	23.1		4.9						
		23.1		5.0						
4-Apr-11	11	23.0	7.96	5.0	316.0					
		23.0	7.98	5.7	313.0					
5-Apr-11	12	22.8		5.4						
		22.8		3.6						
6-Apr-11	13	23.3	8.03	5.0						
		23.2	8.02	4.1						
7-Apr-11	14	23.1		5.3						
		23.1		5.0						
8-Apr-11	15	23.1	7.93	2.9						
		23.1	7.90	3.1						
9-Apr-11	16	23.3		2.3						
		23.4		3.5						
10-Apr-11	17	23.3		4.5						
		23.3		4.5						
11-Apr-11	18	23.7	8.12	5.1	308.0					
		23.7	8.13	5.1	307.0					
12-Apr-11	19	23.3		5.0						
		23.5		5.2						
13-Apr-11	20	23.0	7.67	3.6	288.2			0.00	U	
		23.2	7.80	3.2	294.4					
		23.0	7.69	3.5	289.9					
		23.1	7.82	3.1	299.9					
		22.8	7.74	3.0	293.5					
14-Apr-11	21	22.9		5.5						
		22.9		4.3						
15-Apr-11	22	22.8	7.78	4.6						
		22.8	7.82	4.1						
16-Apr-11	23	23.2		4.5						
		23.2		4.0						
17-Apr-11	24	22.7		4.3						
		22.8		4.8						
18-Apr-11	25	22.8	7.93	6.7	310.0					
		22.8	7.81	5.7	311.0					
19-Apr-11	26	22.9		5.2						
		23.0		6.3						
20-Apr-11	27	23.2	7.86	5.8						
		23.1	7.81	5.3						
21-Apr-11	28	23.1		5.0						
		23.1		5.3						
22-Apr-11	29	22.8	7.74	5.1						
		22.7	7.76	4.8						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 20%

Test Dates: March 24-May 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
23-Apr-11	30	23.0		4.0						
		23.0		5.0						
24-Apr-11	31	23.0		3.3						
		23.0		4.1						
25-Apr-11	32	22.9	7.75	3.6	302.0					
		23.0	7.84	3.8	309.0					
26-Apr-11	33	23.0		4.0						
		23.0		3.9						
27-Apr-11	34	22.8	7.76	3.6						
		22.8	7.78	3.5						
28-Apr-11	35	22.7		3.6						
		22.8		3.7						
29-Apr-11	36	22.7	7.77	4.0						
		22.7	7.70	3.6						
30-Apr-11	37	23.1		4.8						
		23.1		4.4						
1-May-11	38	23.1		3.9						
		23.1		3.8						
2-May-11	39	22.6	7.75	4.6	285.2					
		22.6	7.79	4.3	285.4					
3-May-11	40	22.5		4.3						
		22.6		3.8						
4-May-11	41	22.8	7.65	3.5						
		22.8	7.60	3.2						
5-May-11	42	22.7		3.9						
		22.7		3.4						
6-May-11	43	23.1	7.76	3.2						
		23.1	7.78	3.4						
7-May-11	44	23.1		3.3						
		23.0		3.4						
8-May-11	45	23.1		3.8						
		23.0		3.5						
9-May-11	46	22.6	7.70	3.0	286.1					
		22.6	7.71	3.4	281.4					
10-May-11	47	22.9		4.2						
		22.9		3.2						
11-May-11	48	23.1	7.63	3.5						
		23.1	7.62	3.8						
12-May-11	49	22.6		2.8						
		22.8		2.8						
13-May-11	50	22.4	7.48	3.0						
		22.4	7.57	3.6						
14-May-11	51	22.4	7.72	4.0	293.7	112	136	0.00	U	
Mean		**22.9**	**7.76**	**4.3**	**301**	**118**	**140**	**0.18**		
Number		**106**	**50**	**100**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.13**	**6.7**	**316**	**124**	**144**	**0.54**		
Min#		**22.4**	**7.48**	**2.3**	**281**	**112**	**136**	**0.00**		

Replicate	3	4	8	12
20 day # Surviving	12	12	12	12
Weight-AFDW (mg)	0.96917	1.10750	0.97583	1.01167
Biomass-AFDW (mg)	0.96917	1.10750	0.97583	1.01167

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

20-Day Percent Survival	100.0
Avg. Weight-AFDW (mg)	1.01604
Avg. Biomass-AFDW (mg)	1.01604

Replicate	1	2	5	6	7	9	10	11
Number of Pupae and Live Emerged at Test Termination	12	7	11	11	8	8	7	12
Number of Live Emerged	12	7	11	11	8	8	7	12

Partial Life Cycle	
Survival	79.2
Percent Emerged	79.2

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 40%

Test Dates: March 24-May 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
24-Mar-11	0	22.4	7.76	6.2	312.0	124	128	0.36		
		22.5	7.73	6.3	320.0					
25-Mar-11	1	22.8	7.73	6.0						
		22.8	7.72	5.5						
26-Mar-11	2	22.5								
		22.6								
27-Mar-11	3	22.5								
		22.5								
28-Mar-11	4	22.8	7.70	6.2	307.0					
		22.8	7.74	6.4	305.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.1	7.53	4.3						
		23.1	7.55	4.1						
31-Mar-11	7	23.1		5.0						
		23.0		5.3						
1-Apr-11	8	22.8	7.54	4.5						
		22.8	7.58	4.5						
2-Apr-11	9	23.3		4.0						
		23.3		4.9						
3-Apr-11	10	23.1		4.4						
		23.1		5.7						
4-Apr-11	11	23.0	7.94	5.2	313.0					
		23.0	7.82	4.3	314.0					
5-Apr-11	12	22.9		5.5						
		22.9		5.2						
6-Apr-11	13	23.2	7.92	4.1						
		23.2	8.04	5.1						
7-Apr-11	14	23.1		3.9						
		23.1		3.7						
8-Apr-11	15	22.9	7.64	3.2						
		22.9	7.67	3.0						
9-Apr-11	16	23.4		3.5						
		23.4		4.3						
10-Apr-11	17	23.2		4.7						
		23.2		4.6						
11-Apr-11	18	23.7	8.06	5.7	303.0					
		23.7	8.04	5.5	305.0					
12-Apr-11	19	23.4		4.9						
		23.4		5.0						
13-Apr-11	20	22.8	7.77	3.2	295.3			0.00	U	
		23.0	7.68	3.5	285.7					
		23.0	7.85	3.6	296.1					
		23.0	7.66	3.5	287.6					
14-Apr-11	21	22.8		4.5						
		22.9		4.8						
15-Apr-11	22	22.8	7.78	4.2						
		22.8	7.73	4.0						
16-Apr-11	23	23.1		4.3						
		23.2		3.8						
17-Apr-11	24	22.8		5.4						
		22.8		4.9						
18-Apr-11	25	22.8	7.93	6.7	314.0					
		22.8	7.80	6.2	310.0					
19-Apr-11	26	22.8		5.4						
		22.9		4.5						
20-Apr-11	27	23.1	7.75	5.3						
		23.2	7.75	4.9						
21-Apr-11	28	23.1		5.1						
		23.1		5.5						
22-Apr-11	29	22.7	7.78	4.9						
		22.7	7.64	4.2						
23-Apr-11	30	23.0		3.8						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 40%

Test Dates: March 24-May 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
		22.9		4.6						
24-Apr-11	31	23.0		3.9						
		23.0		3.8						
25-Apr-11	32	23.0	7.79	3.9	306.0					
		23.0	7.86	4.4	307.0					
26-Apr-11	33	23.0		4.0						
		23.1		4.3						
27-Apr-11	34	22.7	7.67	3.3						
		22.8	7.77	4.1						
28-Apr-11	35	22.7		3.8						
		22.7		4.0						
29-Apr-11	36	22.6	7.78	4.2						
		22.6	7.73	4.1						
30-Apr-11	37	23.1		5.3						
		23.1		4.5						
1-May-11	38	23.1		3.6						
		23.1		3.9						
2-May-11	39	22.8	7.75	3.9	285.9					
		22.8	7.71	3.9	279.4					
3-May-11	40	22.5		3.6						
		22.5		3.9						
4-May-11	41	22.8	7.62	3.6						
		22.7	7.69	3.9						
5-May-11	42	22.7		4.0						
		22.7		4.2						
6-May-11	43	23.1	7.73	3.2						
		23.1	7.78	3.9						
7-May-11	44	23.0		3.4						
		23.0		4.0						
8-May-11	45	23.0		3.4						
		23.0		4.0						
9-May-11	46	22.5	7.68	3.0	277.5					
		22.5	7.71	4.2	278.8					
10-May-11	47	22.9		3.2						
		22.9		4.0						
11-May-11	48	22.9	7.87	4.3	282.1	110	136	0.00	U	
	sediment ended	23.1	7.80	3.9	269.6					
Mean		**22.9**	**7.76**	**4.4**	**298**	**117**	**132**	**0.12**		
Number		**100**	**46**	**94**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.06**	**6.7**	**320**	**124**	**136**	**0.36**		
Min#		**22.4**	**7.53**	**3.0**	**270**	**110**	**128**	**0.00**		

Replicate	1	3	4	5
20 days # Surviving	12	12	11	12
Weight-AFDW (mg)	1.32417	0.89917	1.31727	1.01250
Biomass-AFDW (mg)	1.32417	0.89917	1.20750	1.01250

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

20-Day Percent Survival 97.9
Avg. Weight-AFDW (mg) 1.13828
Avg. Biomass-AFDW (mg) 1.11084

Replicate	2	6	7	8	9	10	11	12
Number of Pupae and Live Emerged at Test Termination	10	10	10	8	4	11	12	12
Number of Live Emerged	10	10	10	8	3	11	12	12

Partial Life Cycle
Survival 80.2
Percent Emerged 79.2

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 60%

Test Dates: March 24-May 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
24-Mar-11	0	22.6	7.75	6.3	312.0	120	140	0.24		
		22.7	7.73	6.3	312.0					
25-Mar-11	1	22.7	7.70	5.6						
		22.7	7.71	5.7						
26-Mar-11	2	22.5								
		22.5								
27-Mar-11	3	22.5								
		22.5								
28-Mar-11	4	22.7	7.69	6.0	297.0					
		22.8	7.71	6.0	305.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.1	7.58	4.3						
		23.1	7.57	4.2						
31-Mar-11	7	23.0		5.6						
		23.0		5.2						
1-Apr-11	8	22.8	7.57	4.7						
		22.8	7.59	4.5						
2-Apr-11	9	23.2		3.4						
		23.2		4.5						
3-Apr-11	10	23.1		5.0						
		23.1		5.0						
4-Apr-11	11	23.0	7.74	4.4	309.0					
		23.0	7.83	5.5	313.0					
5-Apr-11	12	22.9		4.8						
		22.8		5.0						
6-Apr-11	13	23.2	7.96	4.9						
		23.2	7.84	3.8						
7-Apr-11	14	23.1		4.0						
		23.0		5.4						
8-Apr-11	15	22.9	7.69	2.8						
		22.9	7.65	2.5						
9-Apr-11	16	23.3		3.0						
		23.3		2.4						
10-Apr-11	17	23.2		4.8						
		23.2		4.9						
11-Apr-11	18	23.6	8.01	5.3	305.0					
		23.6	7.97	5.1	302.0					
12-Apr-11	19	23.4		3.8						
		23.4		4.6						
13-Apr-11	20	22.8	7.68	3.6	287.6			0.00	U	
		22.8	7.84	4.3	283.7					
		22.9	7.64	3.6	289.5					
		22.9	7.75	3.6	285.9					
		22.7	7.82	3.6	290.8					
		23.0	7.80	3.6	289.8					
14-Apr-11	21	22.9		4.3						
		22.9		3.3						
15-Apr-11	22	22.8	7.74	4.2						
		22.8	7.71	3.7						
16-Apr-11	23	23.2		5.7						
		23.1		4.0						
17-Apr-11	24	22.6		4.2						
		22.8		3.9						
18-Apr-11	25	22.8	7.68	4.5	312.0					
		22.8	7.80	5.4	313.0					
19-Apr-11	26	23.0		4.5						
		23.0		5.2						
20-Apr-11	27	23.1	7.52	4.7						
		23.1	7.73	3.5						
21-Apr-11	28	23.1		4.9						
		23.1		4.5						
22-Apr-11	29	22.9	7.67	4.4						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 60%

Test Dates: March 24-May 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
		22.7	7.70	4.1						
23-Apr-11	30	23.1		4.5						
		22.9		4.5						
24-Apr-11	31	22.9		2.8						
		22.8		3.4						
25-Apr-11	32	23.1	7.85	4.5	303.0					
		23.1	7.77	3.9	300.0					
26-Apr-11	33	23.0		3.5						
		23.0		4.2						
27-Apr-11	34	22.8	7.73	3.6						
		22.8	7.72	4.0						
28-Apr-11	35	22.7		3.9						
		22.7		2.6						
29-Apr-11	36	22.8	7.72	4.1						
		22.7	7.71	3.8						
30-Apr-11	37	23.0		5.0						
		23.0		4.0						
1-May-11	38	23.0		2.8						
		23.0		4.2						
2-May-11	39	22.7	7.71	4.0	285.4					
		22.7	7.68	3.4	282.0					
3-May-11	40	22.5		3.6						
		22.5		4.8						
4-May-11	41	22.7	7.65	3.1						
		22.7	7.58	3.6						
5-May-11	42	22.7		3.6						
		22.7		3.9						
6-May-11	43	23.1	7.81	3.7						
		23.1	7.77	3.4						
7-May-11	44	22.8		3.6						
		22.9		4.5						
8-May-11	45	23.0		3.4						
		23.0		3.8						
9-May-11	46	22.9	7.45	4.0	279.9	112	140	0.01	U	
	sediment ended	23.0	7.57	3.7	277.2					
Mean		**22.9**	**7.72**	**4.2**	**297**	**116**	**140**	**0.08**		
Number		**98**	**46**	**92**	**22**	**2**	**2**	**3**		
Max #		**23.6**	**8.01**	**6.3**	**313**	**120**	**140**	**0.24**		
Min#		**22.5**	**7.45**	**2.4**	**277**	**112**	**140**	**0.00**		

Replicate	4	9	11	12
20 days # Surviving	10	12	12	12
Weight-AFDW (mg)	1.12556	1.15417	0.98917	1.00750
Biomass-AFDW (mg)	0.92091	1.15417	0.98917	1.00750

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

20-Day Percent Survival 95.8
Avg. Weight-AFDW (mg) 1.06910
Avg. Biomass-AFDW (mg) 1.01794

Replicate	1	2	3	5	6	7	8	10
Number of Pupae and Live Emerged at Test Termination	12	8	10	9	5	10	11	9
Number of Live Emerged	12	6	8	9	5	8	11	8

Partial Life Cycle
Survival 77.1
Percent Emerged 69.8

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 80%

Test Dates: March 24-May 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
24-Mar-11	0	22.8	7.75	6.3	306.0	118	140	0.19		
		22.8	7.76	6.5	306.0					
25-Mar-11	1	22.7	7.71	5.8						
		22.6	7.73	5.6						
26-Mar-11	2	22.5								
		22.5								
27-Mar-11	3	22.4								
		22.4								
28-Mar-11	4	22.7	7.73	6.2	306.0					
		22.7	7.68	6.2	306.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.1	7.57	4.0						
		23.1	7.57	4.4						
31-Mar-11	7	23.0		5.5						
		22.9		5.5						
1-Apr-11	8	22.8	7.56	4.6						
		22.8	7.60	4.4						
2-Apr-11	9	23.2		3.5						
		23.3		4.2						
3-Apr-11	10	23.1		5.4						
		23.1		5.1						
4-Apr-11	11	22.8	7.77	4.1	310.0					
		22.8	7.87	5.2	307.0					
5-Apr-11	12	22.8		4.3						
		22.8		3.9						
6-Apr-11	13	23.2	7.81	4.3						
		23.2	7.73	3.8						
7-Apr-11	14	23.0		3.5						
		23.0		3.5						
8-Apr-11	15	22.9	7.72	3.3						
		22.9	7.73	3.1						
9-Apr-11	16	23.3		2.7						
		23.3		2.0						
10-Apr-11	17	23.1		4.1						
		23.1		4.1						
11-Apr-11	18	23.6	7.87	5.0	299.5					
		23.6	7.98	5.3	301.0					
12-Apr-11	19	23.2		4.5						
		23.3		5.0						
13-Apr-11	20	22.6	7.66	2.7	284.6			0.00	U	
		22.8	7.67	3.8	279.1					
		22.6	7.76	3.7	288.9					
		22.8	7.68	3.7	281.7					
		22.6	7.65	3.3	284.4					
14-Apr-11	21	22.9		3.5						
		22.9		4.0						
15-Apr-11	22	22.9	7.65	4.2						
		23.0	7.70	3.6						
16-Apr-11	23	23.0		5.4						
		23.1		5.6						
17-Apr-11	24	22.5		4.0						
		22.6		3.9						
18-Apr-11	25	22.7	7.85	5.9	311.0					
		22.7	7.74	4.8	314.0					
19-Apr-11	26	22.7		4.2						
		22.8		5.0						
20-Apr-11	27	22.6	7.66	4.1						
		22.8	7.68	4.1						
21-Apr-11	28	22.9		3.5						
		22.9		4.8						
22-Apr-11	29	22.7	7.71	4.7						
		22.7	7.74	4.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 80%

Test Dates: March 24-May 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
23-Apr-11	30	22.8		3.2						
		22.8		4.2						
24-Apr-11	31	22.8		3.1						
		22.8		3.5						
25-Apr-11	32	22.8	7.72	3.5	301.0					
		22.9	7.88	4.6	301.0					
26-Apr-11	33	22.8		4.0						
		22.9		4.0						
27-Apr-11	34	22.8	7.67	3.5						
		22.8	7.66	3.5						
28-Apr-11	35	22.7		5.0						
		22.7		3.4						
29-Apr-11	36	22.6	7.69	4.0						
		22.7	7.72	4.2						
30-Apr-11	37	23.1		4.6						
		23.0		4.5						
1-May-11	38	22.9		3.7						
		23.1		3.6						
2-May-11	39	22.7	7.73	4.1	283.1					
		22.7	7.71	4.2	279.7					
3-May-11	40	22.0		4.6						
		22.0		3.7						
4-May-11	41	22.7	7.58	3.7						
		22.7	7.64	3.5						
5-May-11	42	22.6		3.5						
		22.6		3.7						
6-May-11	43	23.0	7.73	3.2						
		23.0	7.75	3.4						
7-May-11	44	22.6		3.6						
		22.6		3.9						
8-May-11	45	22.7		3.7						
		22.7		3.6						
9-May-11	46	22.3	7.72	4.4	277.6					
		22.4	7.74	3.8	278.5					
10-May-11	47	22.9		3.4						
		22.9		3.7						
11-May-11	48	23.0	7.65	3.9						
		23.1	7.64	3.3						
12-May-11	49	23.1	7.54	4.5	276.9	110	132	0.04	J	
	sediment ended	23.1	7.69	4.0	277.4					
Mean		**22.8**	**7.71**	**4.2**	**294**	**114**	**136**	**0.08**		
Number		**103**	**49**	**97**	**23**	**2**	**2**	**3**		
Max #		**23.6**	**7.98**	**6.5**	**314**	**118**	**140**	**0.19**		
Min#		**22.0**	**7.54**	**2.0**	**277**	**110**	**132**	**0.00**		

Replicate	1	4	5	12
20 days # Surviving	12	11	12	12
Weight-AFDW (mg)	1.37083	1.21364	1.00750	1.20833
Biomass-AFDW (mg)	1.37083	1.11250	1.00750	1.20833

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

20-Day Percent Survival	97.9
Avg. Weight-AFDW (mg)	1.20008
Avg. Biomass-AFDW (mg)	1.17479

Replicate	2	3	6	7	8	9	10	11
Number of Pupae and Live Emerged at Test Termination	12	8	9	11	6	10	9	7
Number of Live Emerged	12	8	9	10	6	10	9	6

Partial Life Cycle	
Survival	75.0
Percent Emerged	72.9

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 100%

Test Dates: March 24-May 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
24-Mar-11	0	22.6	7.74	6.5	305.0	116	144	0.14		
		22.6	7.76	6.6	302.0					
25-Mar-11	1	22.6	7.70	5.5						
		22.6	7.70	5.7						
26-Mar-11	2	22.3								
		22.3								
27-Mar-11	3	22.3								
		22.3								
28-Mar-11	4	22.6	7.70	6.2	303.0					
		22.6	7.69	6.4	300.0					
29-Mar-11	5	23.1								
		23.1								
30-Mar-11	6	23.1	7.64	5.9						
		23.1	7.65	4.9						
31-Mar-11	7	22.9		5.4						
		22.9		4.9						
1-Apr-11	8	22.7	7.61	4.0						
		22.7	7.48	4.5						
2-Apr-11	9	23.2		3.9						
		23.2		3.8						
3-Apr-11	10	23.1		6.3						
		23.1		5.6						
4-Apr-11	11	22.8	7.77	4.3	305.0					
		22.8	7.78	4.8	306.0					
5-Apr-11	12	22.7		4.1						
		22.7		4.2						
6-Apr-11	13	23.2	7.92	5.1						
		23.2	7.81	4.1						
7-Apr-11	14	23.0		4.4						
		23.0		4.9						
8-Apr-11	15	22.9	7.80	4.5						
		22.9	7.71	4.9						
9-Apr-11	16	23.3		3.8						
		23.3		2.6						
10-Apr-11	17	23.1		4.4						
		23.1		4.6						
11-Apr-11	18	23.4	7.92	5.0	299.3					
		23.4	7.85	4.9	299.5					
12-Apr-11	19	23.1		5.2						
		23.1		5.0						
13-Apr-11	20	22.6	7.73	4.2	279.9			0.00	U	
		22.6	7.65	3.9	275.8					
		22.7	7.69	3.7	278.1					
		22.7	7.70	3.9	276.0					
14-Apr-11	21	22.9		3.8						
		22.9		4.4						
15-Apr-11	22	22.9	7.67	4.2						
		22.9	7.70	4.7						
16-Apr-11	23	23.0		4.5						
		23.0		4.5						
17-Apr-11	24	22.3		6.1						
		22.4		4.5						
18-Apr-11	25	22.7	7.74	6.2	305.0					
		22.6	7.79	4.7	304.0					
19-Apr-11	26	22.6		4.0						
		22.7		5.5						
20-Apr-11	27	22.6	7.67	4.2						
		22.7	7.66	3.8						
21-Apr-11	28	22.9		3.4						
		22.9		3.8						
22-Apr-11	29	22.8	7.63	4.0						
		22.7	7.68	4.5						
23-Apr-11	30	22.7		3.9						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 2.0 (GLC No. 8891) Concentration: 100%

Test Dates: March 24-May 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
		22.7		3.8						
24-Apr-11	31	22.8		3.8						
		22.8		3.2						
25-Apr-11	32	22.8	7.78	3.6	301.0					
		22.8	7.70	3.2	299.7					
26-Apr-11	33	22.8		3.6						
		22.8		3.0						
27-Apr-11	34	22.7	7.60	3.0						
		22.7	7.71	4.0						
28-Apr-11	35	22.6		4.8						
		22.6		4.2						
29-Apr-11	36	22.6	7.65	3.5						
		22.6	7.67	3.4						
30-Apr-11	37	23.1		5.1						
		23.1		3.5						
1-May-11	38	23.0		3.7						
		23.1		4.0						
2-May-11	39	22.6	7.75	4.4	279.7					
		22.6	7.70	4.3	276.4					
3-May-11	40	22.0		4.0						
		22.0		4.2						
4-May-11	41	22.5	7.65	3.3						
		22.5	7.64	3.8						
5-May-11	42	22.6		4.3						
		22.6		4.4						
6-May-11	43	22.9	7.77	3.9						
		22.9	7.72	3.4						
7-May-11	44	22.4		3.7						
		22.5		4.4						
8-May-11	45	22.8		4.0						
		22.7		4.0						
9-May-11	46	23.0	7.61	4.0	277.2	110	132	0.00	U	
	sediment ended	23.0	7.58	3.7	274.1					
Mean		**22.8**	**7.71**	**4.4**	**292**	**113**	**138**	**0.05**		
Number		**96**	**44**	**90**	**20**	**2**	**2**	**3**		
Max #		**23.4**	**7.92**	**6.6**	**306**	**116**	**144**	**0.14**		
Min#		**22.0**	**7.48**	**2.6**	**274**	**110**	**132**	**0.00**		

Replicate	3	5	6	10
20 days # Surviving	9	11	11	12
Weight-AFDW (mg)	1.48875	0.69363	1.26000	1.39500
Biomass-AFDW (mg)	1.08273	0.63583	1.14545	1.39500

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

20-Day Percent Survival	89.6
Avg. Weight-AFDW (mg)	1.20935
Avg. Biomass-AFDW (mg)	1.06475

Replicate	1	2	4	7	8	9	11	12
Number of Pupae and Live Emerged at Test Termination	10	8	9	10	7	8	11	8
Number of Live Emerged	10	8	9	10	7	8	11	8

Partial Life Cycle	
Survival	74.0
Percent Emerged	74.0

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 10%

Test Dates: March 24-May 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
24-Mar-11	0	22.0	7.83	6.7	322.0	128	140	0.60		
		22.0	7.86	6.6	333.0					
25-Mar-11	1	22.8	7.83	6.7						
		22.9	7.84	6.2						
26-Mar-11	2	22.8								
		22.8								
27-Mar-11	3	22.7								
		22.8								
28-Mar-11	4	22.9	7.68	6.0	310.0					
		22.9	7.73	6.2	307.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.60	4.8						
		22.6	7.60	4.2						
31-Mar-11	7	22.9		5.0						
		22.8		4.9						
1-Apr-11	8	22.7	7.57	4.0						
		22.7	7.61	4.1						
2-Apr-11	9	22.7		4.7						
		22.7		5.4						
3-Apr-11	10	22.7		6.1						
		22.7		6.2						
4-Apr-11	11	23.0	8.11	6.0	320.0					
		23.0	8.05	5.4	318.0					
5-Apr-11	12	22.9		4.2						
		22.9		4.1						
6-Apr-11	13	23.2	7.98	2.8						
		23.2	8.14	4.7						
7-Apr-11	14	23.0		5.4						
		23.1		2.9						
8-Apr-11	15	23.0	7.97	3.3						
		23.0	8.00	3.4						
9-Apr-11	16	23.2		2.5						
		23.2		3.0						
10-Apr-11	17	23.1		4.0						
		23.2		4.1						
11-Apr-11	18	23.7	8.02	5.1	306.0					
		23.6	8.01	4.1	309.0					
12-Apr-11	19	23.4		6.0						
		23.3		6.1						
13-Apr-11	20	22.6	7.73	4.5	292.6			0.01	U	
		22.7	7.97	4.3	295.7					
		22.8	8.01	4.7	310.0					
		22.7	7.87	4.3	294.7					
14-Apr-11	21	22.9		3.9						
		22.9		4.1						
15-Apr-11	22	23.0	7.62	4.1						
		23.1	7.70	4.4						
16-Apr-11	23	23.0		4.6						
		23.0		3.9						
17-Apr-11	24	22.6		6.0						
		22.7		6.2						
18-Apr-11	25	22.7	7.84	6.7	326.0					
		22.7	7.90	6.3	323.0					
19-Apr-11	26	22.7		4.4						
		22.8		4.0						
20-Apr-11	27	23.0	7.80	5.2						
		23.0	7.80	4.9						
21-Apr-11	28	23.1		5.4						
		23.1		5.9						
22-Apr-11	29	22.6	7.63	3.0						
		22.6	7.82	4.6						
23-Apr-11	30	22.9		5.0						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 10%

Test Dates: March 24-May 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
		23.0		4.1						
24-Apr-11	31	23.2		4.7						
		23.2		4.7						
25-Apr-11	32	23.0	7.90	4.9	304.0					
		23.0	7.86	4.0	306.0					
26-Apr-11	33	23.0		4.7						
		23.0		5.2						
27-Apr-11	34	22.8	7.79	4.3						
		22.8	7.75	3.8						
28-Apr-11	35	22.7		4.0						
		22.8		3.8						
29-Apr-11	36	22.8	7.71	4.2						
		22.8	7.80	4.0						
30-Apr-11	37	23.0		4.0						
		23.0		4.2						
1-May-11	38	22.9		3.6						
		23.0		3.1						
2-May-11	39	22.6	7.72	3.8	285.4					
		22.6		4.2	286.1					
3-May-11	40	22.8		4.2						
		22.8		4.1						
4-May-11	41	23.0	7.76	3.2						
		23.0	7.69	3.1						
5-May-11	42	22.7		3.4						
		22.7		3.7						
6-May-11	43	22.9	7.70	3.0						
		22.9	7.80	3.3						
7-May-11	44	22.8		3.1						
		22.8		3.3						
8-May-11	45	22.9		3.2						
		22.9		3.3						
9-May-11	46	22.3	7.62	2.9	280.6					
		22.3	7.74	3.2	289.9					
10-May-11	47	22.7	7.62	4.0	289.0	110	140	0.02	U	
	sediment ended	22.7	7.60	3.9	276.2					
Mean		**22.9**	**7.80**	**4.5**	**304**	**119**	**140**	**0.21**		
Number		**98**	**45**	**92**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.14**	**6.7**	**333**	**128**	**140**	**0.60**		
Min#		**22.0**	**7.57**	**2.5**	**276**	**110**	**140**	**0.01**		

Replicate	1	3	9	10
20 days # Surviving	12	12	7	9
Weight-AFDW (mg)	0.74917	0.82417	1.98000	1.52250
Biomass-AFDW (mg)	0.74917	0.82417	0.99000	1.10727

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

20-Day Percent Survival 83.3
Avg. Weight-AFDW (mg) 1.26896
Avg. Biomass-AFDW (mg) 0.91765

Replicate	2	4	5	6	7	8	11	12
Number of Pupae and Live Emerged at Test Termination	10	10	9	6	9	11	11	6
Number of Live Emerged	10	8	9	6	8	11	10	6

Partial Life Cycle
Survival 75.0
Percent Emerged 70.8

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 20%

Test Dates: March 24-May 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
24-Mar-11	0	22.0	7.90	6.9	318.0	130	140	0.64		
		22.0	7.83	7.0	322.0					
25-Mar-11	1	22.9	7.81	6.0						
		23.0	7.86	6.5						
26-Mar-11	2	22.8								
		22.8								
27-Mar-11	3	22.8								
		22.8								
28-Mar-11	4	22.9	7.74	6.2	310.0					
		22.9	7.73	6.3	309.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.59	4.4						
		22.6	7.61	4.9						
31-Mar-11	7	22.9		5.2						
		22.8		5.4						
1-Apr-11	8	22.8	7.61	4.2						
		22.7	7.66	4.8						
2-Apr-11	9	22.7		3.4						
		22.7		3.7						
3-Apr-11	10	22.7		6.1						
		22.8		6.0						
4-Apr-11	11	23.0	7.96	3.9	327.0					
		23.0	8.10	4.1	327.0					
5-Apr-11	12	22.9		3.5						
		22.9		3.6						
6-Apr-11	13	23.2	8.14	4.3						
		23.2	8.06	3.2						
7-Apr-11	14	23.0		3.1						
		23.0		2.8						
8-Apr-11	15	23.0	8.10	4.7						
		23.0	8.02	4.1						
9-Apr-11	16	23.2		2.5						
		23.6		2.3						
10-Apr-11	17	23.2		3.8						
		23.2		3.4						
11-Apr-11	18	23.6	8.06	4.6	309.0			0.02	U	
		23.6	7.91	4.1	308.0					
12-Apr-11	19	23.2		5.0						
		23.3		4.5						
13-Apr-11	20	22.6	7.89	3.8	298.1					
		22.7	7.75	3.2	298.8					
		22.7	7.81	3.9	294.1					
		22.7	7.88	4.0	296.3					
14-Apr-11	21	22.9		5.2						
		22.9		4.0						
15-Apr-11	22	23.1	7.74	4.4						
		23.1	7.67	4.7						
16-Apr-11	23	23.0		3.5						
		23.0		3.9						
17-Apr-11	24	22.5		5.3						
		22.6		4.2						
18-Apr-11	25	22.7	7.88	4.9	326.0					
		22.7	7.84	5.5	319.0					
19-Apr-11	26	23.1		4.6						
		23.0		4.0						
20-Apr-11	27	23.0	7.81	5.8						
		23.0	7.87	5.8						
21-Apr-11	28	23.1		5.0						
		23.1		6.0						
22-Apr-11	29	22.7	7.76	4.4						
		22.7	7.87	3.8						
23-Apr-11	30	23.0		4.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 20%

Test Dates: March 24-May 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
		23.1		4.3						
24-Apr-11	31	23.2		3.1						
		23.2		3.6						
25-Apr-11	32	23.0	7.86	4.4	306.0					
		23.0	7.95	4.6	306.0					
26-Apr-11	33	23.0		4.5						
		23.0		4.4						
27-Apr-11	34	23.0	7.74	3.6						
		23.0	7.70	3.4						
28-Apr-11	35	22.8		3.9						
		22.8		3.9						
29-Apr-11	36	22.9	7.85	4.6						
		22.8	7.78	4.0						
30-Apr-11	37	23.0		4.3						
		23.0		4.5						
1-May-11	38	22.9		3.4						
		22.9		3.8						
2-May-11	39	22.6	7.76	4.1	284.5					
		22.6	7.75	4.1	280.9					
3-May-11	40	22.8		3.5						
		22.8		4.0						
4-May-11	41	23.0	7.70	3.5						
		23.0	7.76	3.7						
5-May-11	42	22.7		3.7						
		22.7		3.4						
6-May-11	43	22.9	7.73	3.2						
		22.9	7.79	3.6						
7-May-11	44	22.9		3.4						
		22.9		3.9						
8-May-11	45	23.0		3.4						
		23.0		3.7						
9-May-11	46	22.3	7.57	3.4	281.0					
		22.3	7.72	3.3	284.9					
10-May-11	47	22.7		3.5						
		22.7		3.4						
11-May-11	48	22.8	7.65	2.9						
		22.8	7.61	2.9						
12-May-11	49	23.1	7.66	4.0	279.7	110	136	0.14		
	sedimnet ended	23.1	7.71	3.7	281.1					
Mean		**22.9**	**7.81**	**4.2**	**303**	**120**	**138**	**0.26**		
Number		**102**	**48**	**96**	**22**	**2**	**2**	**3**		
Max #		**23.6**	**8.14**	**7.0**	**327**	**130**	**140**	**0.64**		
Min#		**22.0**	**7.57**	**2.3**	**280**	**110**	**136**	**0.02**		

Replicate	1	5	10	12
20 days # Surviving	8	7	11	10
Weight-AFDW (mg)	1.39333	2.30800	1.05636	1.53000
Biomass-AFDW (mg)	0.83600	1.15400	0.96833	1.25182

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

20-Day Percent Survival	75.0
Avg. Weight-AFDW (mg)	1.57192
Avg. Biomass-AFDW (mg)	1.05254

Replicate	2	3	4	6	7	8	9	11
Number of Pupae and Live Emerged at Test Termination	9	9	10	7	8	8	8	10
Number of Live Emerged	7	8	10	7	7	8	8	9

Partial Life Cycle	
Survival	71.9
Percent Emerged	66.7

* Data error found and corrected

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 40%

Test Dates: March 24-May 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
24-Mar-11	0	22.0	7.79	6.7	322.0	150	152	0.61		
		22.0	7.79	6.7	324.0					
25-Mar-11	1	23.0	7.76	5.7						
		23.0	7.79	6.4						
26-Mar-11	2	22.8								
		22.8								
27-Mar-11	3	22.7								
		22.8								
28-Mar-11	4	22.9	7.72	6.1	312.0					
		22.9	7.71	6.4	312.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.59	4.7						
		22.6	7.66	4.4						
31-Mar-11	7	22.8		5.4						
		22.8		5.4						
1-Apr-11	8	22.8	7.63	4.1						
		22.8	7.69	4.3						
2-Apr-11	9	22.7		4.8						
		22.7		3.5						
3-Apr-11	10	22.8		5.7						
		22.8		5.4						
4-Apr-11	11	23.0	8.10	4.1	328.0					
		23.1	8.21	5.2	328.0					
5-Apr-11	12	22.9		4.0						
		23.0		3.2						
6-Apr-11	13	23.2	8.10	3.7						
		23.2	8.05	3.1						
7-Apr-11	14	23.0		2.9						
		23.0		3.3						
8-Apr-11	15	23.0	8.09	3.3						
		23.0	8.04	4.7						
9-Apr-11	16	23.2		2.3						
		23.4		2.0						
10-Apr-11	17	23.1		4.2						
		23.1		3.2						
11-Apr-11	18	23.6	8.01	4.9	310.0					
		23.6	8.03	4.7	308.0					
12-Apr-11	19	23.2		4.9						
		23.3		4.5						
13-Apr-11	20	23.0	7.69	3.8	312.0			0.01	U	
		22.9	7.82	3.7	295.9					
		22.8	7.68	2.8	292.2					
		22.8	7.71	3.1	294.6					
14-Apr-11	21	22.9		4.7						
		22.9		4.0						
15-Apr-11	22	22.9	7.77	4.1						
		23.1	7.69	4.0						
16-Apr-11	23	23.0		4.3						
		23.1		3.0						
17-Apr-11	24	22.6		4.4						
		22.6		5.5						
18-Apr-11	25	22.8	7.76	4.6	322.0					
		22.8	7.84	5.7	323.0					
19-Apr-11	26	22.8		4.5						
		23.0		4.0						
20-Apr-11	27	22.9	7.85	5.6						
		23.0	7.90	5.0						
21-Apr-11	28	23.1		4.7						
		23.1		6.2						
22-Apr-11	29	22.6	7.77	3.9						
		22.6	7.74	3.2						
23-Apr-11	30	23.1		5.2						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 40%

Test Dates: March 24-May 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
		23.0		4.1						
24-Apr-11	31	23.2		4.0						
		23.2		3.4						
25-Apr-11	32	23.0	7.95	4.2	307.0					
		23.0	7.86	4.1	304.0					
26-Apr-11	33	23.0		4.9						
		23.0		4.0						
27-Apr-11	34	22.8	7.73	2.9						
		22.8	7.78	3.4						
28-Apr-11	35	23.0		4.4						
		23.0		3.2						
29-Apr-11	36	22.9	7.73	3.4						
		22.9	7.76	3.5						
30-Apr-11	37	23.2		4.3						
		23.2		4.6						
1-May-11	38	22.8		4.0						
		22.8		3.7						
2-May-11	39	22.6	7.85	4.3	286.9					
		22.6	7.89	4.4	289.0					
3-May-11	40	23.0		4.7						
		23.0		4.4						
4-May-11	41	23.0	7.69	3.3						
		22.9	7.63	3.3						
5-May-11	42	22.7		3.4						
		22.7		3.1						
6-May-11	43	22.9	7.87	3.9						
		22.9	7.82	2.9						
7-May-11	44	23.0		4.3						
		22.9		3.5						
8-May-11	45	23.0		3.4						
		23.0		3.0						
9-May-11	46	23.1	7.59	3.7	278.2	90	124	0.02	U	
	sediment ended	23.1	7.64	3.9	277.7					
Mean		**22.9**	**7.81**	**4.2**	**306**	**120**	**138**	**0.21**		
Number		**96**	**44**	**90**	**20**	**2**	**2**	**3**		
Max #		**23.6**	**8.21**	**6.7**	**328**	**150**	**152**	**0.61**		
Min#		**22.0**	**7.59**	**2.0**	**278**	**90**	**124**	**0.01**		

Replicate	5	9	10	11
20 days # Surviving	9	11	12	12
Weight-AFDW (mg)	1.49000	1.19455	1.12083	0.74917
Biomass-AFDW (mg)	1.08364	1.09500	1.12083	0.74917

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

20-Day Percent Survival 91.7
Avg. Weight-AFDW (mg) 1.13864
Avg. Biomass-AFDW (mg) 1.01216

Replicate	1	2	3	4	6	7	8	12
Number of Pupae and Live Emerged at Test Termination	9	11	9	11	8	6	10	11
Number of Live Emerged	8	11	9	9	8	6	9	9

Partial Life Cycle
Survival 78.1
Percent Emerged 71.9

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 60%

Test Dates: March 24-May 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
24-Mar-11	0	22.1	7.76	6.7	320.0	134	152.00	0.58		
		22.1	7.70	6.5	321.0					
25-Mar-11	1	23.0	7.78	6.2						
		23.1	7.77	6.2						
26-Mar-11	2	22.8								
		22.7								
27-Mar-11	3	22.7								
		23.0								
28-Mar-11	4	22.9	7.70	6.0	312.0					
		22.9	7.71	6.4	311.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.63	4.7						
		22.6	7.68	3.9						
31-Mar-11	7	22.7		5.5						
		22.6		5.4						
1-Apr-11	8	22.7	7.77	4.0						
		22.8	7.69	4.0						
2-Apr-11	9	22.7		3.3						
		22.7		3.7						
3-Apr-11	10	22.8		4.7						
		22.8		5.2						
4-Apr-11	11	23.1	8.17	4.8	330.0					
		23.0	8.15	3.9	334.0					
5-Apr-11	12	23.0		4.0						
		23.1		4.5						
6-Apr-11	13	23.2	8.12	4.2						
		23.2	8.11	3.4						
7-Apr-11	14	23.0		3.1						
		23.0		2.8						
8-Apr-11	15	23.0	7.97	3.4						
		23.0	8.12	5.3						
9-Apr-11	16	23.6		2.8						
		23.5		2.1						
10-Apr-11	17	23.2		3.8						
		23.2		4.0						
11-Apr-11	18	23.7	8.00	4.6	312.0					
		23.6	7.93	4.6	309.0					
12-Apr-11	19	23.3		5.0						
		23.3		4.1						
13-Apr-11	20	22.8	7.89	4.3	299.5			0.01	U	
		22.8	7.81	3.6	295.2					
		22.7	7.90	4.1	281.4					
		22.8	7.73	2.7	296.9					
14-Apr-11	21	22.9		3.7						
		22.9		4.0						
15-Apr-11	22	23.1	7.69	4.2						
		23.1	7.66	3.6						
16-Apr-11	23	23.0		4.5						
		23.1		4.7						
17-Apr-11	24	22.5		4.1						
		22.6		4.4						
18-Apr-11	25	22.8	7.94	4.6	332.0					
		22.8	7.82	4.3	325.0					
19-Apr-11	26	23.0		3.4						
		23.0		3.7						
20-Apr-11	27	22.9	7.80	4.5						
		22.9	7.83	4.5						
21-Apr-11	28	23.1		5.5						
		23.1		5.6						
22-Apr-11	29	22.7	7.66	3.3						
		22.7	7.78	3.2						
23-Apr-11	30	22.9		3.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 60%

Test Dates: March 24-May 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
		23.0		3.4						
24-Apr-11	31	23.1		3.2						
		23.2		2.6						
25-Apr-11	32	23.0	7.84	4.0	304.0					
		23.0	7.87	3.8	309.0					
26-Apr-11	33	23.0		3.9						
		23.0		3.8						
27-Apr-11	34	22.8	7.68	3.2						
		22.8	7.74	3.0						
28-Apr-11	35	23.0		4.2						
		22.9		3.8						
29-Apr-11	36	22.9	7.74	4.5						
		22.9	7.84	3.7						
30-Apr-11	37	23.2		3.4						
		23.2		3.4						
1-May-11	38	22.9		3.5						
		22.8		3.3						
2-May-11	39	22.6	7.76	3.4	284.0					
		22.6	7.74	4.2	280.9					
3-May-11	40	22.9		3.7						
		22.9		4.3						
4-May-11	41	22.9	7.65	3.8						
		22.9	7.68	3.4						
5-May-11	42	22.6		2.8						
		22.6		3.0						
6-May-11	43	23.0	7.81	3.0						
		23.0	7.81	3.4						
7-May-11	44	23.0		3.7						
		22.9		3.7						
8-May-11	45	23.1		2.9						
		23.0		3.3						
9-May-11	46	22.3	7.74	3.4	283.4					
		22.3	7.72	3.4	282.0					
10-May-11	47	22.7	7.69	4.0	277.1	108	132.00	0.05	J	
	sediment ended	22.7	7.66	4.0	279.9					
Mean		**22.9**	**7.81**	**4.0**	**304**	**121**	**142**	**0.22**		
Number		**98**	**46**	**92**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.17**	**6.7**	**334**	**134**	**152**	**0.58**		
Min#		**22.1**	**7.63**	**2.1**	**277**	**108**	**132**	**0.01**		

Replicate	3	4	9	10
20 days # Surviving	9	10	11	12
Weight-AFDW (mg)	1.40125	1.16300	1.20909	1.30667
Biomass-AFDW (mg)	1.01909	0.96917	1.10833	1.30667

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

20-Day Percent Survival	87.5
Avg. Weight-AFDW (mg)	1.27000
Avg. Biomass-AFDW (mg)	1.10082

Replicate	1	2	5	6	7	8	11	12
Number of Pupae and Live Emerged at Test Termination	8	9	9	8	7	11	7	11
Number of Live Emerged	8	8	9	7	6	11	7	11

Partial Life Cycle	
Survival	72.9
Percent Emerged	69.8

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 80%

Test Dates: March 24-May 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
24-Mar-11	0	22.1	7.78	6.2	323.0	138	152	0.70		
		22.1	7.76	6.5	328.0	136	148	0.69		
25-Mar-11	1	23.2	7.74	5.7						
		23.1	7.74	5.9						
26-Mar-11	2	22.8								
		22.8								
27-Mar-11	3	23.0								
		22.9								
28-Mar-11	4	22.8	7.69	6.1	330.0					
		22.9	7.67	5.7	329.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.62	3.7						
		22.6	7.61	4.0						
31-Mar-11	7	22.6		6.0						
		22.7		5.8						
1-Apr-11	8	22.7	7.75	4.4						
		22.7	7.76	4.6						
2-Apr-11	9	22.7		5.1						
		22.7		4.4						
3-Apr-11	10	22.8		5.0						
		22.8		6.3						
4-Apr-11	11	23.0	8.03	4.1	335.0					
		22.9	8.06	4.1	339.0					
5-Apr-11	12	23.0		3.3						
		23.0		3.4						
6-Apr-11	13	23.2	8.06	3.9						
		23.2	8.06	3.0						
7-Apr-11	14	23.1		2.6						
		23.1		2.6						
8-Apr-11	15	23.0	7.97	3.5						
		23.0	7.99	4.2						
9-Apr-11	16	23.5		2.0						
		23.6		2.0						
10-Apr-11	17	23.2		3.0						
		23.1		3.1						
11-Apr-11	18	23.6	7.89	3.8	310.0					
		23.6	7.90	3.7	308.0					
12-Apr-11	19	23.3		4.5						
		23.4		3.5						
13-Apr-11	20	22.8	7.76	2.5	303.0			0.02	U	
		22.9	7.74	2.2	302.0					
		22.7	7.84	3.7	298.2					
		22.8	7.80	4.1	293.7					
14-Apr-11	21	22.9		3.2						
		22.9		2.9						
15-Apr-11	22	23.1	7.71	3.2						
		23.1	7.74	3.5						
16-Apr-11	23	23.1		4.5						
		23.2		5.0						
17-Apr-11	24	22.5		3.6						
		22.6		3.2						
18-Apr-11	25	22.8	7.78	4.9	318.0					
		22.8	7.84	3.8	334.0					
19-Apr-11	26	22.7		3.1						
		22.8		3.3						
20-Apr-11	27	23.0	7.69	4.1						
		23.0	7.63	3.4						
21-Apr-11	28	23.1		3.8						
		23.1		4.4						
22-Apr-11	29	22.7	7.74	4.0						
		22.7	7.85	3.4						
23-Apr-11	30	22.9		3.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 80%

Test Dates: March 24-May 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
		22.8		3.2						
24-Apr-11	31	23.2		2.5						
		23.1		2.8						
25-Apr-11	32	23.0	7.93	4.2	308.0					
		23.0	7.91	4.1	300.0					
26-Apr-11	33	23.1		2.8						
		23.1		3.8						
27-Apr-11	34	22.7	7.82	3.4						
		22.7	7.79	4.6						
28-Apr-11	35	23.0		4.0						
		23.0		2.9						
29-Apr-11	36	22.9	7.69	4.0						
		22.9	7.70	3.5						
30-Apr-11	37	23.1		3.9						
		23.1		4.6						
1-May-11	38	22.5		2.9						
		22.7		3.7						
2-May-11	39	22.4	7.81	3.7	296.4					
		22.4	7.75	3.3	288.7					
3-May-11	40	22.8		3.5						
		22.8		3.4						
4-May-11	41	22.9	7.52	2.9						
		22.8	7.57	2.7						
5-May-11	42	22.6		3.0						
		22.6		3.3						
6-May-11	43	23.0	7.72	3.0						
		23.0	7.71	2.7						
7-May-11	44	22.9		3.5						
		22.9		3.6						
8-May-11	45	23.1		3.4						
		23.0		3.3						
9-May-11	46	22.3	7.62	3.2	278.5					
		22.3	7.63	2.9	280.4					
10-May-11	47	22.7		3.1						
		22.8		3.2						
11-May-11	48	22.1	7.85	4.4	279.6	112	132	0.14		
	sediment ended	22.1	7.78	3.9	276.5					
Mean		**22.9**	**7.78**	**3.8**	**307**	**129**	**144**	**0.39**		
Number		**100**	**46**	**94**	**22**	**3**	**3**	**4**		
Max #		**23.6**	**8.06**	**6.5**	**339**	**138**	**152**	**0.70**		
Min#		**22.1**	**7.52**	**2.0**	**277**	**112**	**132**	**0.02**		

Replicate	1	10	11	12
20 days # Surviving	11	10	12	12
Weight-AFDW (mg)	1.08273	1.39000	0.82250	1.23750
Biomass-AFDW (mg)	0.99250	1.15833	0.82250	1.23750

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

20-Day Percent Survival 93.8
Avg. Weight-AFDW (mg) 1.13318
Avg. Biomass-AFDW (mg) 1.05271

Replicate	2	3	4	5	6	7	8	9
Number of Pupae and Live Emerged at Test Termination	10	11	10	9	8	8	6	9
Number of Live Emerged	10	11	10	9	7	8	6	9

Partial Life Cycle
Survival 74.0
Percent Emerged 72.9

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 100%

Test Dates: March 24-May 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
24-Mar-11	0	22.1	7.74	6.0	339.0	142	160	0.72		
		22.1	7.75	6.0	335.0					
25-Mar-11	1	23.0	7.69	5.3						
		23.0	7.71	6.0						
26-Mar-11	2	22.8								
		22.7								
27-Mar-11	3	22.8								
		22.8								
28-Mar-11	4	22.9	7.67	5.8	326.0					
		22.9	7.66	6.0	329.0					
29-Mar-11	5	22.9								
		22.9								
30-Mar-11	6	22.6	7.60	4.1						
		22.6	7.59	3.9						
31-Mar-11	7	22.7		5.8						
		22.6		5.9						
1-Apr-11	8	22.7	7.77	4.5						
		22.7	7.72	4.5						
2-Apr-11	9	22.7		3.3						
		22.7		4.4						
3-Apr-11	10	22.8		5.9						
		22.8		4.4						
4-Apr-11	11	22.8	7.85	3.1	319.0					
		22.9	8.15	4.7	339.0					
5-Apr-11	12	23.0		3.6						
		23.0		4.2						
6-Apr-11	13	23.2	8.04	3.5						
		23.2	8.00	3.3						
7-Apr-11	14	23.0		4.2						
		23.0		3.0						
8-Apr-11	15	23.0	8.02	4.5						
		23.0	8.00	5.1						
9-Apr-11	16	23.4		2.1						
		23.6		1.8						
10-Apr-11	17	23.2		2.9						
		23.2		2.6						
11-Apr-11	18	23.6	8.01	3.7	314.0					
		23.6	7.92	4.1	310.0					
12-Apr-11	19	23.4		3.8						
		23.4		3.5						
13-Apr-11	20	22.6	7.71	2.4	301.0			0.01	U	
		22.8	7.73	2.5	296.1					
		22.7	7.78	2.6	306.0					
		22.7	7.78	2.6	303.0					
14-Apr-11	21	22.9		2.8						
		22.9		2.7						
15-Apr-11	22	23.1	7.82	3.5						
		23.1	7.80	4.2						
16-Apr-11	23	23.0		5.0						
		23.1		4.2						
17-Apr-11	24	22.6		3.2						
		22.5		3.2						
18-Apr-11	25	22.8	7.55	2.6	315.0					
		22.8	7.51	2.1	315.0					
19-Apr-11	26	23.0		2.5						
		23.0		1.8						
20-Apr-11	27	22.9	7.66	3.7						
		23.0	7.71	3.8						
21-Apr-11	28	23.1		3.2						
		23.1		4.0						
22-Apr-11	29	22.7	7.54	2.8						
		22.7	7.50	2.5						
23-Apr-11	30	22.8		5.2						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 100%

Test Dates: March 24-May 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
		22.8		3.5						
24-Apr-11	31	23.0		3.3						
		23.0		3.7						
25-Apr-11	32	23.1	7.80	4.0	304.0					
		23.1	7.56	3.0	294.7					
26-Apr-11	33	23.0		4.2						
		23.0		4.4						
27-Apr-11	34	22.6	7.74	3.6						
		22.6	7.66	2.9						
28-Apr-11	35	23.0		3.7						
		23.0		3.2						
29-Apr-11	36	22.9	7.69	2.5						
		23.0	7.68	3.9						
30-Apr-11	37	23.1		2.6						
		23.2		3.9						
1-May-11	38	22.7		3.6						
		22.7		3.7						
2-May-11	39	22.4	7.71	4.1	279.8					
		22.5	7.69	4.0	281.0					
3-May-11	40	23.0		3.9						
		23.0		3.3						
4-May-11	41	22.8	7.53	3.6						
		22.8	7.58	3.2						
5-May-11	42	22.6		2.9						
		22.6		3.1						
6-May-11	43	23.0	7.65	3.8						
		23.0	7.74	3.2						
7-May-11	44	23.1		3.6						
		23.0		3.7						
8-May-11	45	23.1		3.0						
		23.0		3.1						
9-May-11	46	22.3	7.57	2.9	273.3					
		22.3	7.59	3.0	276.2					
10-May-11	47	22.7		3.1						
		22.8		3.2						
11-May-11	48	22.8	7.49	2.9						
		22.7	7.49	3.4						
12-May-11	49	22.7	7.56	3.5	275.6	108	128	0.06	J	
	sediment ended	22.8	7.56	3.4	274.6					
Mean		**22.9**	**7.71**	**3.7**	**305**	**125**	**144**	**0.26**		
Number		**102**	**48**	**96**	**22**	**2**	**2**	**3**		
Max #		**23.6**	**8.15**	**6.0**	**339**	**142**	**160**	**0.72**		
Min#		**22.1**	**7.49**	**1.8**	**273**	**108**	**128**	**0.01**		

Replicate	4	5	8	12
20 days # Surviving	12	11	12	12
Weight-AFDW (mg)	1.22250	1.32545	1.24333	1.48667
Biomass-AFDW (mg)	1.22250	1.21500	1.24333	1.48667

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

20-Day Percent Survival	97.9
Avg. Weight-AFDW (mg)	1.31949
Avg. Biomass-AFDW (mg)	1.29188

Replicate	1	2	3	6	7	9	10	11
Number of Pupae and Live Emerged at Test Termination	9	9	9	5	8	11	12	10
Number of Live Emerged	9	9	9	5	7	10	12	9

Partial Life Cycle	
Survival	76.0
Percent Emerged	72.9

* red outline indicates corrected data entry error

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 10%

Test Dates: March 24-May 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
24-Mar-11	0	22.9	7.57	6.7	317.0	120	152	0.64		
		23.1	7.65	6.3	315.0					
25-Mar-11	1	23.1	7.65	6.0						
		23.2	7.74	6.3						
26-Mar-11	2	22.9								
		23.0								
27-Mar-11	3	22.8								
		23.0								
28-Mar-11	4	22.9	7.59	6.0	311.0					
		23.1	7.58	6.3	312.0					
29-Mar-11	5	23.2								
		23.2								
30-Mar-11	6	23.1	7.46	4.2						
		23.1	7.49	4.4						
31-Mar-11	7	23.1		5.2						
		23.1		5.2						
1-Apr-11	8	22.6	7.50	4.5						
		22.7	7.44	4.7						
2-Apr-11	9	23.3		3.8						
		23.3		3.3						
3-Apr-11	10	23.3		4.9						
		23.3		4.9						
4-Apr-11	11	23.2	7.79	5.9	309.0					
		23.3	7.76	4.5	310.0					
5-Apr-11	12	23.2		4.9						
		23.2		6.0						
6-Apr-11	13	23.2	7.76	4.1						
		23.2	7.95	5.9						
7-Apr-11	14	23.1		4.2						
		23.2		2.9						
8-Apr-11	15	23.2	7.68	3.7						
		23.2	7.77	3.2						
9-Apr-11	16	23.5		2.2						
		23.5		4.3						
10-Apr-11	17	23.2		4.3						
		23.3		4.6						
11-Apr-11	18	23.7	7.98	5.1	305.0					
		23.7	8.03	5.5	304.0					
12-Apr-11	19	23.4		4.8						
		23.4		4.6						
13-Apr-11	20	23.1	7.85	3.6	295.2			0.04	J	
		23.1	7.79	3.3	292.5					
		23.0	7.80	3.8	292.5					
		23.0	7.67	4.1	293.3					
14-Apr-11	21	23.3		3.5						
		23.3		4.3						
15-Apr-11	22	23.1	7.56	4.2						
		23.1	7.51	4.2						
16-Apr-11	23	23.2		5.2						
		23.4		5.2						
17-Apr-11	24	22.7		6.1						
		22.8		4.9						
18-Apr-11	25	23.0	7.90	6.4	315.0					
		23.0	7.87	5.7	313.0					
19-Apr-11	26	23.2		5.6						
		23.3		4.6						
20-Apr-11	27	23.2	7.87	5.6						
		23.3	7.89	6.0						
21-Apr-11	28	23.5		6.0						
		23.5		5.9						
22-Apr-11	29	23.0	7.86	5.0						
		23.0	7.80	4.4						
23-Apr-11	30	23.4		5.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 10%

Test Dates: March 24-May 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
		23.4		4.9						
24-Apr-11	31	23.4		3.8						
		23.4		5.0						
25-Apr-11	32	23.2	7.86	4.0	307.0					
		23.2	7.85	4.1	309.0					
26-Apr-11	33	23.1		5.0						
		23.1		4.7						
27-Apr-11	34	23.1	7.67	4.0						
		23.1	7.80	4.5						
28-Apr-11	35	23.4		4.4						
		23.4		4.5						
29-Apr-11	36	23.1	7.83	4.5						
		23.0	7.77	4.0						
30-Apr-11	37	23.4		4.6						
		23.4		4.4						
1-May-11	38	23.2		4.4						
		23.2		4.1						
2-May-11	39	23.2	7.86	4.2	279.5					
		23.2	7.80	3.6	278.6					
3-May-11	40	23.2		3.6						
		23.2		5.1						
4-May-11	41	23.5	7.60	3.6						
		23.5	7.67	4.3						
5-May-11	42	23.1		4.0						
		23.1		3.8						
6-May-11	43	23.4	7.61	3.1						
		23.4	7.78	3.7						
7-May-11	44	23.4		4.0						
		23.4		4.3						
8-May-11	45	23.5		3.6						
		23.5		3.5						
9-May-11	46	23.6	7.61	3.4	284.9					
		23.6	7.79	3.9	288.7					
10-May-11	47	23.2		3.9						
		23.2		3.5						
11-May-11	48	22.8	7.67	3.7						
		22.8	7.63	3.6						
12-May-11	49	22.9		2.8						
		23.0		3.7						
13-May-11	50	22.8	7.59	3.3	278.5	112	132	0.00	U	
		22.8	7.73	3.9	282.5					
Mean		**23.2**	**7.73**	**4.5**	**300**	**116**	**142**	**0.23**		
Number		**104**	**48**	**98**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.03**	**6.7**	**317**	**120**	**152**	**0.64**		
Min#		**22.6**	**7.44**	**2.2**	**279**	**112**	**132**	**0.00**		

Replicate	2	5	8	11
20 days # Surviving	12	12	12	12
Weight-AFDW (mg)	0.98364	1.06417	1.15417	1.07000
Biomass-AFDW (mg)	0.98364	1.06417	1.15417	1.07000

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

20-Day Percent Survival	100.0
Avg. Weight-AFDW (mg)	1.06800
Avg. Biomass-AFDW (mg)	1.06800

Replicate	1	3	4	6	7	9	10	12
Number of Pupae and Live Emerged at Test Termination	9	8	9	9	9	8	8	9
Number of Live Emerged	9	7	9	7	9	8	8	9

Partial Life Cycle	
Survival	71.9
Percent Emerged	68.8

* red outline indicates corrected data entry error

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 20%

Test Dates: March 24-May 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
24-Mar-11	0	23.3	7.73	6.4	311.0	112	148	0.38		
		23.5	7.73	6.3	311.0	114	148	0.28		
25-Mar-11	1	23.2	7.73	6.1						
		23.2	7.74	5.9						
26-Mar-11	2	23.2								
		23.2								
27-Mar-11	3	23.1								
		23.1								
28-Mar-11	4	23.1	7.59	6.3	315.0					
		23.1	7.64	6.2	309.0					
29-Mar-11	5	23.2								
		23.2								
30-Mar-11	6	23.1	7.55	4.9						
		23.1	7.60	4.4						
31-Mar-11	7	23.3		5.2						
		23.2		5.3						
1-Apr-11	8	22.7	7.47	4.5						
		22.8	7.46	4.5						
2-Apr-11	9	23.3		5.1						
		23.3		3.9						
3-Apr-11	10	23.3		6.4						
		23.3		5.2						
4-Apr-11	11	23.3	7.78	4.5	310.0					
		23.3	7.79	4.5	312.0					
5-Apr-11	12	23.2		3.9						
		23.2		4.2						
6-Apr-11	13	23.3	7.84	3.4						
		23.3	7.77	3.5						
7-Apr-11	14	23.2		4.2						
		23.2		3.6						
8-Apr-11	15	23.2	7.82	3.3						
		23.2	7.81	3.7						
9-Apr-11	16	23.4		2.7						
		23.4		2.3						
10-Apr-11	17	23.2		4.0						
		23.3		3.5						
11-Apr-11	18	23.7	8.07	5.4	307.0					
		23.7	8.06	5.2	307.0					
12-Apr-11	19	23.4		5.0						
		23.5		5.4						
13-Apr-11	20	23.0	7.83	3.6	295.1			0.02	U	
		23.1	7.91	4.5	293.9					
		23.0	7.81	3.5	294.1					
		23.1	7.93	5.1	290.9					
14-Apr-11	21	23.3		4.3						
		23.3		4.2						
15-Apr-11	22	23.1	7.59	4.2						
		23.0	7.57	4.0						
16-Apr-11	23	23.2		6.0						
		23.3		5.3						
17-Apr-11	24	22.9		5.8						
		22.9		5.2						
18-Apr-11	25	23.0	7.83	5.3	317.0					
		23.0	7.85	5.8	319.0					
19-Apr-11	26	23.1		4.6						
		23.2		4.5						
20-Apr-11	27	23.1	7.82	5.6						
		23.2	7.80	5.1						
21-Apr-11	28	23.5		5.5						
		23.5		5.5						
22-Apr-11	29	23.1	7.83	4.1						
		23.1	7.80	4.4						
23-Apr-11	30	23.3		4.2						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 20%

Test Dates: March 24-May 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
		23.3		4.1						
24-Apr-11	31	23.4		3.2						
		23.4		3.9						
25-Apr-11	32	23.2	7.79	4.0	302.0					
		23.2	7.83	3.7	311.0					
26-Apr-11	33	23.1		4.6						
		23.2		3.6						
27-Apr-11	34	23.2	7.70	4.0						
		23.3	7.66	3.6						
28-Apr-11	35	23.3		3.0						
		23.3		4.5						
29-Apr-11	36	23.1	7.77	4.3						
		23.1	7.82	4.7						
30-Apr-11	37	23.3		4.8						
		23.4		4.2						
1-May-11	38	23.5		4.1						
		23.3		3.9						
2-May-11	39	23.2	7.80	4.2	286.2					
		23.2	7.84	5.1	284.9					
3-May-11	40	23.3		4.4						
		23.3		4.6						
4-May-11	41	23.5	7.64	3.2						
		23.4	7.67	3.7						
5-May-11	42	23.1		3.5						
		23.1		3.0						
6-May-11	43	23.4	7.83	4.3						
		23.4	7.81	3.7						
7-May-11	44	23.3		4.5						
		23.4		4.4						
8-May-11	45	23.5		3.6						
		23.6		3.5						
9-May-11	46	23.5	7.78	3.8	286.5					
		23.6	7.76	3.9	284.3					
10-May-11	47	23.2		3.7						
		23.2		3.5						
11-May-11	48	22.8	7.67	3.3						
		22.8	7.73	3.1						
12-May-11	49	22.9		3.3						
		22.9		2.9						
13-May-11	50	22.8	7.75	4.5	282.8	110	132	0.00	U	
		22.8	7.71	4.6	277.7					
Mean		**23.2**	**7.76**	**4.4**	**300**	**112**	**143**	**0.17**		
Number		**104**	**48**	**98**	**22**	**3**	**3**	**4**		
Max #		**23.7**	**8.07**	**6.4**	**319**	**114**	**148**	**0.38**		
Min#		**22.7**	**7.46**	**2.3**	**278**	**110**	**132**	**0.00**		

Replicate	2	4	8	10
20 days # Surviving	12	12	10	12
Weight-AFDW (mg)	1.19000	0.98917	1.30000	1.29909
Biomass-AFDW (mg)	1.19000	0.98917	1.04000	1.29909

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

20-Day Percent Survival	95.8
Avg. Weight-AFDW (mg)	1.19457
Avg. Biomass-AFDW (mg)	1.12957

Replicate	1	3	5	6	7	9	11	12
Number of Pupae and Live Emerged at Test Termination	9	10	9	8	9	6	8	12
Number of Live Emerged	9	9	8	8	9	6	8	12

Partial Life Cycle	
Survival	74.0
Percent Emerged	71.9

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 40%

Test Dates: March 24-May 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
24-Mar-11	0	23.6	7.72	6.5	308.0	116	152	0.30		
		23.6	7.73	6.5	310.0					
25-Mar-11	1	23.3	7.67	5.5						
		23.3	7.69	5.4						
26-Mar-11	2	23.2								
		23.2								
27-Mar-11	3	23.1								
		23.2								
28-Mar-11	4	23.1	7.61	6.0	309.0					
		23.1	7.64	6.1	310.0					
29-Mar-11	5	23.2								
		23.2								
30-Mar-11	6	23.1	7.54	4.5						
		23.1	7.57	4.4						
31-Mar-11	7	23.2		5.4						
		23.2		5.1						
1-Apr-11	8	22.8	7.50	4.2						
		22.8	7.53	4.7						
2-Apr-11	9	23.3		3.6						
		23.3		3.9						
3-Apr-11	10	23.3		5.2						
		23.3		5.6						
4-Apr-11	11	23.3	7.80	4.4	309.0					
		23.3	7.73	4.0	315.0					
5-Apr-11	12	23.2		5.2						
		23.2		4.3						
6-Apr-11	13	23.3	7.88	3.8						
		23.3	7.84	3.5						
7-Apr-11	14	23.3		3.1						
		23.3		2.9						
8-Apr-11	15	23.2	8.00	3.9						
		23.2	7.82	3.3						
9-Apr-11	16	23.4		2.0						
		23.4		2.3						
10-Apr-11	17	23.3		3.5						
		23.4		3.6						
11-Apr-11	18	23.6	8.00	4.9	307.0					
		23.6	8.06	5.1	306.0					
12-Apr-11	19	23.6		4.9						
		23.6		4.6						
13-Apr-11	20	23.3	7.68	3.1	299.3			0.20		
		23.2	7.77	3.5	294.6					
		23.0	7.79	2.9	296.2					
		23.1	7.89	3.5	300.0					
14-Apr-11	21	23.3		3.6						
		23.3		3.9						
15-Apr-11	22	23.0	7.58	4.0						
		23.0	7.54	3.6						
16-Apr-11	23	23.3		4.4						
		23.4		5.2						
17-Apr-11	24	22.8		5.0						
		23.0		5.3						
18-Apr-11	25	23.0		6.7	315.0					
		23.0		5.3	316.0					
19-Apr-11	26	22.8		5.6						
		23.1		5.1						
20-Apr-11	27	23.2	7.83	5.6						
		23.3	7.90	5.9						
21-Apr-11	28	23.5		5.4						
		23.5		5.1						
22-Apr-11	29	23.0	7.82	4.6						
		23.0	7.91	5.6						
23-Apr-11	30	23.3		5.3						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 40%

Test Dates: March 24-May 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
		23.3		4.3						
24-Apr-11	31	23.5		3.9						
		23.4		4.2						
25-Apr-11	32	23.2	7.84	3.9	305.0					
		23.2	7.91	4.4	305.0					
26-Apr-11	33	23.2		4.0						
		23.2		4.6						
27-Apr-11	34	23.2	7.73	3.8						
		23.2	7.68	3.1						
28-Apr-11	35	23.5		3.5						
		23.5		3.7						
29-Apr-11	36	23.1	7.77	4.0						
		23.1	7.69	3.9						
30-Apr-11	37	23.3		4.1						
		23.3		4.4						
1-May-11	38	23.4		3.4						
		23.4		3.5						
2-May-11	39	23.2	7.71	4.1	284.0					
		23.2	7.66	3.6	281.8					
3-May-11	40	23.3		4.0						
		23.3		3.5						
4-May-11	41	23.4	7.63	3.8						
		23.4	7.62	3.8						
5-May-11	42	23.1		3.1						
		23.1		3.2						
6-May-11	43	23.4	7.76	3.2						
		23.4	7.73	3.2						
7-May-11	44	23.4		3.8						
		23.4		4.0						
8-May-11	45	23.7		3.4						
		23.7		3.0						
9-May-11	46	23.0	7.67	4.0	279.3	110	140	0.02	U	
	sediment ended	23.0	7.64	4.2	283.1					
Mean		**23.3**	**7.74**	**4.3**	**302**	**113**	**146**	**0.17**		
Number		**96**	**42**	**90**	**20**	**2**	**2**	**3**		
Max #		**23.7**	**8.06**	**6.7**	**316**	**116**	**152**	**0.30**		
Min#		**22.8**	**7.50**	**2.0**	**279**	**110**	**140**	**0.02**		

Replicate	3	4	11	12
20 days # Surviving	12	12	11	10
Weight-AFDW (mg)	1.16583	1.02750	0.76000	1.12000
Biomass-AFDW (mg)	1.16583	1.02750	0.69667	0.84000

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

20-Day Percent Survival	93.8
Avg. Weight-AFDW (mg)	1.01833
Avg. Biomass-AFDW (mg)	0.93250

Replicate	1	2	5	6	7	8	9	10
Number of Pupae and Live Emerged at Test Termination	10	12	8	9	8	12	9	8
Number of Live Emerged	9	12	8	8	8	12	9	8

Partial Life Cycle	
Survival	79.2
Percent Emerged	77.1

* red outline indicates corrected data entry error

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 60%

Test Dates: March 24-May 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
24-Mar-11	0	23.6	7.72	6.2	307.0	118	140	0.24		
		23.7	7.72	6.1	307.0					
25-Mar-11	1	23.3	7.70	5.7						
		23.2	7.72	5.8						
26-Mar-11	2	23.2								
		23.1								
27-Mar-11	3	23.2								
		23.2								
28-Mar-11	4	23.1	7.62	6.1	307.0					
		23.1	7.62	6.3	308.0					
29-Mar-11	5	23.2								
		23.2								
30-Mar-11	6	23.1	7.55	4.4						
		23.1	7.56	4.5						
31-Mar-11	7	23.3		5.5						
		23.3		5.2						
1-Apr-11	8	22.9	7.51	4.5						
		22.9	7.59	4.5						
2-Apr-11	9	23.3		4.2						
		23.3		3.9						
3-Apr-11	10	23.2		4.7						
		23.3		5.4						
4-Apr-11	11	23.3	7.78	4.5	308.0					
		23.3	7.82	4.3	315.0					
5-Apr-11	12	23.2		2.8						
		23.2		4.3						
6-Apr-11	13	23.3	8.05	5.6						
		23.3	7.80	3.2						
7-Apr-11	14	23.3		5.9						
		23.3		5.4						
8-Apr-11	15	23.2	7.76	2.2						
		23.2	7.86	3.7						
9-Apr-11	16	23.5		3.8						
		23.5		1.1						
10-Apr-11	17	23.3		4.0						
		23.4		4.1						
11-Apr-11	18	23.6	8.02	5.1	305.0					
		23.6	8.06	5.5	306.0					
12-Apr-11	19	23.6		5.2						
		23.5		4.7						
13-Apr-11	20	23.0	7.87	4.4	292.8			0.04	J	
		23.1	7.82	3.5	294.3					
		23.0	7.83	3.6	297.1					
		23.1	7.87	3.5	295.2					
14-Apr-11	21	23.3		3.0						
		23.3		3.9						
15-Apr-11	22	23.0	7.53	3.7						
		23.0	7.58	4.1						
16-Apr-11	23	23.3		3.9						
		23.5		3.6						
17-Apr-11	24	22.8		5.4						
		22.8		4.1						
18-Apr-11	25	23.0		5.3	319.0					
		23.0		5.0	316.0					
19-Apr-11	26	23.0		3.6						
		23.1		5.2						
20-Apr-11	27	23.2	7.79	4.7						
		23.2	7.82	4.9						
21-Apr-11	28	23.5		4.8						
		23.5		4.6						
22-Apr-11	29	23.0	7.84	4.2						
		23.0	7.79	4.0						
23-Apr-11	30	23.2		4.1						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 60%

Test Dates: March 24-May 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
		23.2		4.5						
24-Apr-11	31	23.4		2.5						
		23.3		4.5						
25-Apr-11	32	23.2	7.89	4.6	304.0					
		23.2	7.83	3.7	306.0					
26-Apr-11	33	23.2		3.9						
		23.2		4.4						
27-Apr-11	34	23.2	7.71	4.0						
		23.2	7.72	4.0						
28-Apr-11	35	23.5		3.7						
		23.5		4.5						
29-Apr-11	36	23.1	7.80	4.3						
		23.1	7.81	4.2						
30-Apr-11	37	23.5		4.7						
		23.5		4.7						
1-May-11	38	23.6		4.1						
		23.5		3.9						
2-May-11	39	23.1	7.72	4.5	286.1					
		23.1	7.73	3.8	282.9					
3-May-11	40	23.3		2.9						
		23.3		4.1						
4-May-11	41	23.4	7.59	2.8						
		23.3	7.66	3.8						
5-May-11	42	23.1		3.9						
		23.1		3.5						
6-May-11	43	23.4	7.67	2.8						
		23.4	7.84	4.1						
7-May-11	44	23.3		3.1						
		23.4		4.3						
8-May-11	45	23.7		4.0						
		23.7		3.6						
9-May-11	46	23.6	7.68	3.7	275.6	110	156	0.01	U	
	sediment ended	23.6	7.75	4.1	285.3					
Mean		**23.3**	**7.75**	**4.3**	**301**	**114**	**148**	**0.10**		
Number		**96**	**42**	**90**	**20**	**2**	**2**	**3**		
Max #		**23.7**	**8.06**	**6.3**	**319**	**118**	**156**	**0.24**		
Min#		**22.8**	**7.51**	**1.1**	**276**	**110**	**140**	**0.01**		

Replicate	5	8	10	11
20 days # Surviving	11	12	12	11
Weight-AFDW (mg)	1.07636	1.04750	1.27545	1.28727
Biomass-AFDW (mg)	0.98667	1.04750	1.27546	1.18000

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

20-Day Percent Survival	95.8
Avg. Weight-AFDW (mg)	1.17165
Avg. Biomass-AFDW (mg)	1.12241

Replicate	1	2	3	4	6	7	9	12
Number of Pupae and Live Emerged at Test Termination	10	10	8	8	9	10	9	6
Number of Live Emerged	10	10	8	8	9	10	9	6

Partial Life Cycle	
Survival	72.9
Percent Emerged	72.9

* red outline indicates corrected data entry error

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 80%

Test Dates: March 24-May 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
24-Mar-11	0	23.6	7.70	6.1	300.0	118	144	0.19		
		23.6	7.70	6.4	304.0					
25-Mar-11	1	23.3	7.70	5.8						
		23.2	7.67	5.6						
26-Mar-11	2	23.1								
		23.0								
27-Mar-11	3	23.1								
		23.1								
28-Mar-11	4	23.1	7.63	6.2	304.0					
		23.1	7.61	6.2	307.0					
29-Mar-11	5	23.2								
		23.2								
30-Mar-11	6	23.1	7.54	4.4						
		23.1	7.56	4.6						
31-Mar-11	7	23.2		4.9						
		23.2		5.4						
1-Apr-11	8	22.9	7.54	5.0						
		22.9	7.50	4.7						
2-Apr-11	9	23.2		3.9						
		23.3		4.5						
3-Apr-11	10	23.2		4.6						
		23.2		5.4						
4-Apr-11	11	23.2	7.90	5.3	311.0					
		23.2	7.83	4.6	310.0					
5-Apr-11	12	23.2		3.9						
		23.2		4.3						
6-Apr-11	13	23.3	7.78	4.2						
		23.3	7.91	3.1						
7-Apr-11	14	23.3		3.4						
		23.2		3.3						
8-Apr-11	15	23.2	7.68	2.3						
		23.2	7.65	3.8						
9-Apr-11	16	23.4		2.2						
		23.4		1.6						
10-Apr-11	17	23.3		5.2						
		23.3		3.8						
11-Apr-11	18	23.4	8.06	4.1	307.0					
		23.3	7.93	4.1	306.0					
12-Apr-11	19	23.5		4.3						
		23.5		4.0						
13-Apr-11	20	23.6	7.45	2.4	291.5			0.02	U	
		23.3	7.61	2.9	294.7					
		23.2	7.71	3.6	293.6					
		23.5	7.72	3.4	297.1					
14-Apr-11	21	23.3		3.2						
		23.3		3.6						
15-Apr-11	22	23.0	7.59	3.5						
		23.0	7.63	3.9						
16-Apr-11	23	23.3		4.1						
		23.5		4.3						
17-Apr-11	24	22.7		2.6						
		22.8		4.1						
18-Apr-11	25	23.1		5.7	316.0					
		23.1		4.9	319.0					
19-Apr-11	26	23.1		4.0						
		23.2		4.0						
20-Apr-11	27	23.1	7.81	4.9						
		23.2	7.70	4.1						
21-Apr-11	28	23.5		4.3						
		23.5		4.6						
22-Apr-11	29	23.1	7.88	4.6						
		23.1	7.79	3.9						
23-Apr-11	30	23.2		3.3						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03
Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 80%

Test Dates: March 24-May 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
		23.2		3.4						
24-Apr-11	31	23.3		3.2						
		23.3		3.2						
25-Apr-11	32	23.2	7.81	4.9	297.7					
		23.2	7.88	4.6	300.0					
26-Apr-11	33	23.2		3.6						
		23.2		3.8						
27-Apr-11	34	23.1	7.74	4.3						
		23.2	7.73	4.9						
28-Apr-11	35	23.5		3.0						
		23.5		4.1						
29-Apr-11	36	23.2	7.75	4.2						
		23.3	7.83	4.6						
30-Apr-11	37	23.5		4.6						
		23.5		4.3						
1-May-11	38	23.4		4.0						
		23.6		3.9						
2-May-11	39	23.1	7.74	4.5	282.6					
		23.1	7.71	4.3	281.3					
3-May-11	40	23.2		3.3						
		23.2		4.2						
4-May-11	41	23.3	7.59	3.3						
		23.3	7.61	3.8						
5-May-11	42	23.1		3.6						
		23.1		4.3						
6-May-11	43	23.4	7.71	2.9						
		23.4	7.82	3.7						
7-May-11	44	23.3		4.0						
		23.6		4.9						
8-May-11	45	23.7		3.9						
		23.7		3.9						
9-May-11	46	23.5	7.67	3.7	281.1					
		23.5	7.75	4.4	280.2					
10-May-11	47	23.2		3.8						
		23.2		3.7						
11-May-11	48	22.9	7.58	2.8						
		22.9	7.58	3.4						
12-May-11	49	22.4	7.66	3.6	279.6	110	132	0.04	J	
	sediment ended	22.5	7.67	3.9	277.6					
Mean		**23.2**	**7.71**	**4.1**	**297**	**114**	**138**	**0.08**		
Number		**102**	**46**	**96**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**8.06**	**6.4**	**319**	**118**	**144**	**0.19**		
Min#		**22.4**	**7.45**	**1.6**	**278**	**110**	**132**	**0.02**		

Replicate	1	3	9	12
20 days # Surviving	12	12	12	12
Weight-AFDW (mg)	1.23000	1.80500	0.98083	1.11667
Biomass-AFDW (mg)	1.23000	1.80500	0.98083	1.11667

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

20-Day Percent Survival	100.0
Avg. Weight-AFDW (mg)	1.28313
Avg. Biomass-AFDW (mg)	1.28313

Replicate	2	4	5	6	7	8	10	11
Number of Pupae and Live Emerged at Test Termination	11	10	6	12	8	12	7	5
Number of Live Emerged	10	10	6	12	7	12	7	5

Partial Life Cycle	
Survival	74.0
Percent Emerged	71.9

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 100%

Test Dates: March 24-May 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
24-Mar-11	0	23.6	7.70	6.3	300.0	112	140	0.14		
		23.6	7.71	6.2	301.0					
25-Mar-11	1	23.2	7.65	5.7						
		23.2	7.66	6.0						
26-Mar-11	2	23.0								
		23.0								
27-Mar-11	3	23.1								
		23.1								
28-Mar-11	4	23.1	7.62	6.0	304.0					
		23.1	7.62	6.3	303.0					
29-Mar-11	5	23.2								
		23.2								
30-Mar-11	6	23.1	7.56	4.1						
		23.1	7.58	4.3						
31-Mar-11	7	23.2		5.3						
		23.2		5.6						
1-Apr-11	8	22.9	7.64	5.0						
		22.9	7.65	5.4						
2-Apr-11	9	23.3		4.1						
		23.3		3.6						
3-Apr-11	10	23.2		5.2						
		23.2		5.7						
4-Apr-11	11	23.2	7.88	5.7	302.0					
		23.2	7.91	5.7	307.0					
5-Apr-11	12	23.2		6.3						
		23.2		4.3						
6-Apr-11	13	23.3	7.80	3.1						
		23.3	7.88	4.7						
7-Apr-11	14	23.2		3.4						
		23.2		3.5						
8-Apr-11	15	23.2	7.70	2.7						
		23.2	7.71	3.1						
9-Apr-11	16	23.4		1.6						
		23.4		3.4						
10-Apr-11	17	23.3		4.0						
		23.2		4.0						
11-Apr-11	18	23.4	7.89	5.1	304.0					
		23.5	7.98	4.8	303.0					
12-Apr-11	19	23.4		4.7						
		23.4		4.6						
13-Apr-11	20	23.0	7.57	3.0	283.4			0.02	U	
		23.1	7.73	3.8	290.0					
		23.2	7.74	3.4	295.3					
		23.3	7.73	3.7	293.2					
14-Apr-11	21	23.3		3.6						
		23.3		3.7						
15-Apr-11	22	22.9	7.60	3.9						
		23.0	7.64	3.7						
16-Apr-11	23	23.5		4.2						
		23.4		4.0						
17-Apr-11	24	22.7		4.4						
		22.8		4.6						
18-Apr-11	25	23.1		5.3	319.0					
		23.1		6.2	317.0					
19-Apr-11	26	22.8		3.1						
		23.2		3.3						
20-Apr-11	27	23.1	7.75	4.8						
		23.2	7.77	4.6						
21-Apr-11	28	23.5		4.3						
		23.5		6.0						
22-Apr-11	29	23.1	7.85	4.3						
		23.1	7.80	4.0						
23-Apr-11	30	23.1		3.5						

Project Name: Tennessee Valley Authority (TVA)

Project Number: 5069-03

Sample ID: CRM 4.0 (GLC No. 8895) Concentration: 100%

Test Dates: March 24-May 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
		23.1		4.4						
24-Apr-11	31	23.3		2.7						
		23.2		3.5						
25-Apr-11	32	23.2	7.78	3.9	304.0					
		23.2	7.92	4.9	304.0					
26-Apr-11	33	23.2		3.7						
		23.2		3.9						
27-Apr-11	34	22.9	7.68	3.5						
		23.1	7.66	3.1						
28-Apr-11	35	23.5		3.7						
		23.5		3.2						
29-Apr-11	36	23.2	7.77	4.0						
		23.2	7.74	4.2						
30-Apr-11	37	23.5		4.4						
		23.5		4.8						
1-May-11	38	23.6		4.4						
		23.6		3.5						
2-May-11	39	23.1	7.76	4.6	282.5					
		23.1	7.74	4.2	282.6					
3-May-11	40	23.2		4.2						
		23.2		4.7						
4-May-11	41	23.3	7.68	4.1						
		23.3	7.67	4.4						
5-May-11	42	23.1		3.5						
		23.1		3.3						
6-May-11	43	23.4	7.80	3.4						
		23.3	7.81	4.0						
7-May-11	44	23.3		4.0						
		23.3		4.7						
8-May-11	45	23.7		4.3						
		23.7		3.7						
9-May-11	46	23.5	7.68	3.9	278.6					
		23.5	7.71	4.3	279.8					
10-May-11	47	23.2		3.9						
		23.0		3.6						
11-May-11	48	22.2	7.85	5.1	276.8	108	136	0.00	U	
	sediment ended	21.9	7.48	5.0	274.3					
Mean		**23.2**	**7.73**	**4.3**	**296**	**110**	**138**	**0.05**		
Number		**100**	**44**	**94**	**22**	**2**	**2**	**3**		
Max #		**23.7**	**7.98**	**6.3**	**319**	**112**	**140**	**0.14**		
Min#		**21.9**	**7.48**	**1.6**	**274**	**108**	**136**	**0.00**		

Replicate	1	4	10	11
20 days # Surviving	12	12	9	12
Weight-AFDW (mg)	0.89000	0.97667	1.31333	1.04417
Biomass-AFDW (mg)	0.89000	0.97667	0.98500	1.04417

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

20-Day Percent Survival 93.8
Avg. Weight-AFDW (mg) 1.05604
Avg. Biomass-AFDW (mg) 0.97396

Replicate	2	3	5	6	7	8	9	12
Number of Pupae and Live Emerged at Test Termination	9	7	6	6	10	9	5	6
Number of Live Emerged	9	7	6	6	10	9	5	6

Partial Life Cycle
Survival 60.4
Percent Emerged 60.4

Appendix C 2
Overlying Water Quality Summaries

- *Hyalella azteca*

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03

Test Dates: March 22-April 19, 2011
Test Type: 28-Day Survival and Growth Whole Sediment Toxicity Tests
Test Species: *Hyalella azteca*

Data Entry

Date	Initials	Data Entry
3/28/11	DS	day 0
3/29/2011	DS	day 1-6
4/1/11	EB	day 7-10
4/4/2011	DR	day 11-12
4/5/11	eb	day 13-15
4/7/2011	NS	day 16
4/20/11	NS	days 17-28

QC Data

4/1/2011	eb	day 0-6
4/1/11	NS	days 7-10
4/6/2011	eb	day 11-12
4/7/11	NS	days 13-15
4/27/2011	AS	days 16-28

10% QC

5/3/2011	eb	days 0-28

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRS (8897) -CRM 7.0

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.1	7.25	7.0	321	128	144	0.92	
		22.3	7.26	7.1	321				
23-Mar-11	1	22.4	7.67	6.4					
		22.5	7.73	6.4					
24-Mar-11	2	23.0		6.1					
		23.0		6.3					
25-Mar-11	3	22.8	7.64	6.7					
		22.7	7.69	6.4					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.6							
		22.6							
28-Mar-11	6	22.7	7.79	7.0	304				
		22.7	7.85	6.7	305				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.5	7.89	6.1					
		22.5	7.87	6.0					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.86	6.4					
		22.5	7.89	6.4					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.8							
4-Apr-11	13	22.7	8.03	6.6	311				
		22.7	8.02	6.6	310				
5-Apr-11	14	22.7							
		22.6							
6-Apr-11	15	22.8	7.98	6.4					
		22.8	7.97	6.3					
7-Apr-11	16	22.6		6.2					
		22.6		6.4					
8-Apr-11	17	22.8	7.90	6.6					
		22.8	7.93	6.1					
9-Apr-11	18	22.6		6.6					
		22.6		6.7					
10-Apr-11	19	23.1		4.7					
		23.2		4.5					
11-Apr-11	20	23.0	8.06	6.0	305				
		22.9	7.95	6.0	308				
12-Apr-11	21	22.7		6.6					
		22.8		6.8					
13-Apr-11	22	22.7	8.00	6.3					
		22.7	8.08	6.1					
14-Apr-11	23	22.6		6.4					
		22.6		6.3					
15-Apr-11	24	22.5	8.05	6.6					
		22.6	8.04	6.4					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	22.7	8.02	6.8	311				
		22.8	8.16	6.7	314				
19-Apr-11	28	22.6	8.10	7.5	316	122	120	0.17	
		22.6	8.17	7.1	311				
Mean		**22.7**	**7.89**	**6.4**	**311**	**125**	**132**	**0.55**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.2**	**8.17**	**7.5**	**321**	**128**	**144**	**0.92**	
Min#		**22.1**	**7.25**	**4.5**	**304**	**122**	**120**	**0.17**	

Replicate	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
# Surviving	9	8	10	10	9	10	9	8
Weight- (mg)	0.35222	0.35000	0.31400	0.24300	0.32333	0.30300	0.25667	0.50625
Biomass- (mg)	0.31700	0.28000	0.31400	0.24300	0.29100	0.30300	0.23100	0.40500

28-Day Percent Survival 91.3%
Avg. Weight- (mg) 0.33106
Avg. Biomass- (mg) 0.29800
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: LCS+CRW Labratory Control Sediment

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.33	5.8	331	134	148	0.75	
		22.3	7.36	5.8	331				
23-Mar-11	1	22.4	7.64	6.0					
		22.4	7.63	5.7					
24-Mar-11	2	23.0		5.7					
		23.0		5.6					
25-Mar-11	3	22.8	7.68	6.1					
		22.8	7.68	5.9					
26-Mar-11	4	22.5							
		22.5							
27-Mar-11	5	22.5							
		22.8							
28-Mar-11	6	22.8	7.68	7.0	309				
		22.8	7.77	6.9	314				
29-Mar-11	7	22.7							
		22.6							
30-Mar-11	8	22.5	7.97	8.0					
		22.5	7.97	7.9					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.76	6.0					
		22.5	7.69	5.9					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.8							
		22.8							
4-Apr-11	13	22.7	7.84	5.0	319				
		22.7	7.95	5.5	318				
5-Apr-11	14	22.7							
		22.7							
6-Apr-11	15	22.8	7.79	5.1					
		22.8	7.82	5.0					
7-Apr-11	16	22.6		5.5					
		22.6		5.4					
8-Apr-11	17	22.8	7.91	4.9					
		22.7	7.95	5.0					
9-Apr-11	18	22.5		5.0					
		22.6		5.6					
10-Apr-11	19	23.3		5.8					
		23.4		6.1					
11-Apr-11	20	22.9	7.83	4.6	318				
		22.9	7.90	4.6	318				
12-Apr-11	21	22.8		5.3					
		22.7		5.6					
13-Apr-11	22	22.3	7.91	5.0					
		22.4	7.90	4.8					
14-Apr-11	23	22.6		5.8					
		22.6		5.4					
15-Apr-11	24	22.6	7.95	5.9					
		22.6	7.82	5.9					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.4							
		22.5							
18-Apr-11	27	22.7	7.77	5.8	306				
		22.8	7.76	5.8	307				
19-Apr-11	28	22.5	7.68	6.3	309	124	136	0.00	U
		22.5	7.81	5.9	311				
Mean		**22.7**	**7.78**	**5.7**	**316**	**129**	**142**	**0.38**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.4**	**7.97**	**8.0**	**331**	**134**	**148**	**0.75**	
Min#		**22.3**	**7.33**	**4.6**	**306**	**124**	**136**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	9	8	9	9	10	10
Weight- (mg)	0.44700	0.35200	0.46889	0.41250	0.48778	0.42111	0.45300	0.38900
Biomass- (mg)	0.44700	0.35200	0.42200	0.33000	0.43900	0.37900	0.45300	0.38900

28-Day Percent Survival 93.8%
Avg. Weight- (mg) 0.42891
Avg. Biomass- (mg) 0.40138
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: LCS+GLW Labratory Control Sediment

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.1	7.24	6.0	333	130	152	0.99	
		22.1	7.29	6.0	331				
23-Mar-11	1	22.7	7.60	5.6					
		22.6	7.63	5.4					
24-Mar-11	2	22.7		5.6					
		22.7		5.7					
25-Mar-11	3	22.9	7.60	6.1					
		22.9	7.65	6.4					
26-Mar-11	4	22.5							
		22.6							
27-Mar-11	5	22.2							
		22.2							
28-Mar-11	6	22.9	7.71	6.6	313				
		23.0	7.76	6.7	312				
29-Mar-11	7	22.7							
		22.8							
30-Mar-11	8	22.2	7.11	6.3					
		22.2	7.43	6.1					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.80	6.4					
		22.5	7.84	6.2					
2-Apr-11	11	23.0							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.6	7.87	6.0	312				
		22.6	7.81	5.9	308				
5-Apr-11	14	22.9							
		22.9							
6-Apr-11	15	22.9	7.89	5.5					
		22.8	7.90	4.2					
7-Apr-11	16	22.7		6.2					
		22.7		4.5					
8-Apr-11	17	22.6	7.91	4.2					
		22.6	8.14	5.2					
9-Apr-11	18	22.2		5.0					
		22.2		5.2					
10-Apr-11	19	23.1		3.8					
		23.1		3.8					
11-Apr-11	20	22.9	8.00	4.6	319				
		22.9	7.89	4.7	316				
12-Apr-11	21	22.9		5.5					
		22.9		4.9					
13-Apr-11	22	22.7	7.53	4.0					
		22.6	7.75	4.5					
14-Apr-11	23	22.8		5.1					
		22.7		5.5					
15-Apr-11	24	22.8	7.86	4.7					
		22.8	7.80	5.2					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.3							
		22.5							
18-Apr-11	27	22.6	7.65	6.0	312				
		22.8	7.67	6.3	312				
19-Apr-11	28	22.6	7.76	6.7	310	110	132	0.00	U
		22.6	7.87	6.4	327				
Mean		**22.7**	**7.71**	**5.5**	**317**	**120**	**142**	**0.50**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.14**	**6.7**	**333**	**130**	**152**	**0.99**	
Min#		**22.1**	**7.11**	**3.8**	**308**	**110**	**132**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	10	10	10	10	10
Weight- (mg)	0.41600	0.41600	0.48300	0.47100	0.58500	0.40200	0.41300	0.36000
Biomass- (mg)	0.41600	0.41600	0.48300	0.47100	0.58500	0.40200	0.41300	0.36000

28-Day Percent Survival 100.0%
Avg. Weight- (mg) 0.44325
Avg. Biomass- (mg) 0.44325
Average Weight of *H.azteca* at day 0: 0.01850mg

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: GLW Water Only

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.87	8.0	299	102	136	0.01	U
		22.2	7.88	8.1	300				
23-Mar-11	1	22.8	7.97	6.9					
		22.7	8.01	7.3					
24-Mar-11	2	22.8		7.1					
		22.8		7.3					
25-Mar-11	3	23.0	7.84	7.7					
		23.0	7.95	7.6					
26-Mar-11	4	22.8							
		22.8							
27-Mar-11	5	22.6							
		22.6							
28-Mar-11	6	23.0	7.72	7.5	300				
		23.0	7.71	7.7	298				
29-Mar-11	7	22.7							
		22.8							
30-Mar-11	8	22.5	7.70	7.7					
		22.5	7.72	7.7					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.91	6.6					
		22.5	7.90	6.4					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.6	8.03	7.7	302				
		22.7	8.13	7.5	302				
5-Apr-11	14	23.0							
		23.1							
6-Apr-11	15	22.9	8.09	7.6					
		22.8	8.12	7.7					
7-Apr-11	16	22.8		7.0					
		22.8		7.3					
8-Apr-11	17	22.6	8.15	7.6					
		22.6	8.14	7.7					
9-Apr-11	18	22.4		7.6					
		22.4		7.7					
10-Apr-11	19	23.0		7.0					
		23.1		6.3					
11-Apr-11	20	22.9	8.04	7.3	299				
		22.9	8.03	6.9	299				
12-Apr-11	21	23.1		7.7					
		23.1		7.9					
13-Apr-11	22	22.7	7.89	6.5					
		22.6	8.01	7.5					
14-Apr-11	23	22.6		8.2					
		22.6		8.0					
15-Apr-11	24	22.7	7.89	7.9					
		22.8	7.99	8.2					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.4							
		22.5							
18-Apr-11	27	22.7	7.94	8.1	300				
		22.9	7.97	8.2	300				
19-Apr-11	28	22.6	7.96	7.5	300	104	128	0.00	U
		22.6	7.98	7.8	306				
Mean		**22.7**	**7.95**	**7.5**	**300**	**103**	**132**	**0.01**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.15**	**8.2**	**306**	**104**	**136**	**0.01**	
Min#		**22.2**	**7.70**	**6.3**	**298**	**102**	**128**	**0.00**	

Replicate	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
# Surviving	8	9	10	10	10	10	10	10
Weight- (mg)	0.15375	0.23333	0.22100	0.32700	0.26100	0.21600	0.23800	0.27300
Biomass- (mg)	0.12300	0.21000	0.22100	0.32700	0.26100	0.21600	0.23800	0.27300

28-Day Percent Survival 96.3%
Avg. Weight- (mg) 0.24039
Avg. Biomass- (mg) 0.23363
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 1.5 (GLC No. 8889) Concentration: 10%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.57	6.5	319	128	148	0.71	
		22.3	7.59	6.4	321				
23-Mar-11	1	22.3	7.72	6.7					
		22.3	7.76	6.6					
24-Mar-11	2	22.9		6.5					
		22.9		6.0					
25-Mar-11	3	22.8	7.68	6.2					
		22.8	7.71	6.5					
26-Mar-11	4	22.5							
		22.5							
27-Mar-11	5	22.7							
		22.8							
28-Mar-11	6	22.8	7.78	7.0	302				
		22.8	7.82	7.0	305				
29-Mar-11	7	22.6							
		22.7							
30-Mar-11	8	22.5	7.81	6.2					
		22.6	7.79	6.4					
31-Mar-11	9	22.6							
		22.7							
1-Apr-11	10	22.5	7.95	6.5					
		22.5	7.89	6.4					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.8							
4-Apr-11	13	22.6	8.24	6.3	322				
		22.7	8.34	6.4	319				
5-Apr-11	14	22.7							
		22.7							
6-Apr-11	15	22.8	8.26	6.3					
		22.8	8.31	6.4					
7-Apr-11	16	22.6		6.7					
		22.6		6.5					
8-Apr-11	17	22.7	8.34	6.6					
		22.7	8.28	5.9					
9-Apr-11	18	22.6		6.8					
		22.6		6.6					
10-Apr-11	19	23.2		6.2					
		23.3		6.0					
11-Apr-11	20	22.9	8.19	5.8	324				
		22.9	8.37	5.7	326				
12-Apr-11	21	22.8		6.8					
		22.8		6.6					
13-Apr-11	22	22.6	8.23	6.8					
		22.5	8.22	6.5					
14-Apr-11	23	22.6		6.7					
		22.6		6.4					
15-Apr-11	24	22.6	8.06	6.9					
		22.6	8.10	7.1					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.4							
		22.3							
18-Apr-11	27	22.7	8.15	7.4	312				
		22.8	8.17	7.2	312				
19-Apr-11	28	22.5	8.18	6.7	319	126	144	0.00	U
		22.6	8.18	7.1	317				
Mean		**22.7**	**8.02**	**6.5**	**317**	**127**	**146**	**0.36**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.3**	**8.37**	**7.4**	**326**	**128**	**148**	**0.71**	
Min#		**22.3**	**7.57**	**5.7**	**302**	**126**	**144**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	8	8	10	10	10	10	10
Weight- (mg)	0.23400	0.29375	0.21625	0.25000	0.24500	0.24700	0.29300	0.34600
Biomass- (mg)	0.23400	0.23500	0.17300	0.25000	0.24500	0.24700	0.29300	0.34600

28-Day Percent Survival 95.0%
Avg. Weight- (mg) 0.26563
Avg. Biomass- (mg) 0.25288
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 20%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.64	6.4	317	124	140	0.63	
		22.4	7.64	6.2	317				
23-Mar-11	1	22.4	7.80	6.0					
		22.5	7.79	6.3					
24-Mar-11	2	22.9		5.8					
		22.9		5.9					
25-Mar-11	3	22.8	7.72	6.2					
		22.8	7.74	6.4					
26-Mar-11	4	22.5							
		22.6							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	22.7	7.88	6.7	305				
		22.7	7.87	6.8	306				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.79	6.0					
		22.6	7.76	6.1					
31-Mar-11	9	22.7							
		22.7							
1-Apr-11	10	22.5	7.90	6.9					
		22.5	7.92	6.4					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.7	8.31	6.5	316				
		22.6	8.28	6.4	318				
5-Apr-11	14	22.7							
		22.8							
6-Apr-11	15	22.8	8.26	6.2					
		22.8	8.26	6.2					
7-Apr-11	16	22.7		6.5					
		22.8		6.7					
8-Apr-11	17	22.7	8.23	6.4					
		22.7	8.29	6.7					
9-Apr-11	18	22.6		6.3					
		22.5		6.5					
10-Apr-11	19	23.3		6.0					
		23.3		6.0					
11-Apr-11	20	22.9	8.28	5.6	326				
		22.9	8.34	6.0	323				
12-Apr-11	21	22.8		6.7					
		22.7		6.6					
13-Apr-11	22	22.5	8.20	6.3					
		22.5	8.26	6.6					
14-Apr-11	23	22.6		6.7					
		22.6		6.2					
15-Apr-11	24	22.6	8.16	6.9					
		22.6	8.20	6.7					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	22.7	8.14	7.3	310				
		22.8	8.15	7.1	315				
19-Apr-11	28	22.6	8.14	7.1	311	124	136	0.00	U
		22.6	8.15	7.0	316				
Mean		**22.7**	**8.04**	**6.4**	**315**	**124**	**138**	**0.32**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.3**	**8.34**	**7.3**	**326**	**124**	**140**	**0.63**	
Min#		**22.3**	**7.64**	**5.6**	**305**	**124**	**136**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	8	8	9	10	7	9	10
Weight- (mg)	0.28700	0.32000	0.35250	0.28556	0.29700	0.34429	0.33667	0.23500
Biomass- (mg)	0.28700	0.25600	0.28200	0.25700	0.29700	0.24100	0.30300	0.23500

28-Day Percent Survival 88.8%
Avg. Weight- (mg) 0.30725
Avg. Biomass- (mg) 0.26975
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 40%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.4	7.65	6.4	312	122	140	0.45	
		22.3	7.54	6.4	311				
23-Mar-11	1	22.5	7.77	6.2					
		22.5	7.76	6.2					
24-Mar-11	2	22.9		6.2					
		22.9		6.3					
25-Mar-11	3	22.8	7.77	6.2					
		22.7	7.78	6.4					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	22.8	7.88	6.7	305				
		22.8	7.85	6.8	306				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.76	5.9					
		22.6	7.79	6.2					
31-Mar-11	9	22.7							
		22.7							
1-Apr-11	10	22.5	7.92	6.6					
		22.5	7.90	6.6					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.7	8.26	6.6	314				
		22.7	8.22	6.7	314				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	8.16	6.2					
		22.8	8.21	6.1					
7-Apr-11	16	22.7		6.5					
		22.7		6.3					
8-Apr-11	17	22.7	8.25	6.4					
		22.7	8.25	6.3					
9-Apr-11	18	22.6		6.5					
		22.6		6.5					
10-Apr-11	19	23.5		6.1					
		23.5		6.4					
11-Apr-11	20	22.9	8.27	5.8	330				
		22.9	8.22	5.8	321				
12-Apr-11	21	23.0		6.7					
		22.9		6.7					
13-Apr-11	22	22.5	8.21	6.7					
		22.6	8.21	6.6					
14-Apr-11	23	22.6		6.4					
		22.6		6.4					
15-Apr-11	24	22.6	8.18	6.7					
		22.5	8.17	6.9					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.4							
		22.5							
18-Apr-11	27	22.7	8.10	7.1	307				
		22.7	8.15	7.2	311				
19-Apr-11	28	22.6	8.13	7.0	314	124	136	0.00	U
		22.5	8.18	7.1	310				
Mean		**22.7**	**8.02**	**6.5**	**313**	**123**	**138**	**0.23**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.27**	**7.2**	**330**	**124**	**140**	**0.45**	
Min#		**22.3**	**7.54**	**5.8**	**305**	**122**	**136**	**0.00**	

Replicate	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
# Surviving	10	10	8	10	7	8	10	9
Weight- (mg)	0.25900	0.21600	0.28250	0.22100	0.30857	0.27000	0.21500	0.24667
Biomass- (mg)	0.25900	0.21600	0.22600	0.22100	0.21600	0.21600	0.21500	0.22200

28-Day Percent Survival 90.0%
Avg. Weight- (mg) 0.25234
Avg. Biomass- (mg) 0.22388
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 1.5 (GLC No. 8889) Concentration: 60%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.62	6.0	303	114	132	0.35	
		22.3	7.62	6.1	305				
23-Mar-11	1	22.4	7.74	6.2					
		22.5	7.71	6.0					
24-Mar-11	2	22.9		6.6					
		22.9		6.7					
25-Mar-11	3	22.7	7.79	6.6					
		22.7	7.79	6.6					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	22.8	7.85	7.0	300				
		22.8	7.84	7.0	301				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.73	5.9					
		22.6	7.79	6.0					
31-Mar-11	9	22.7							
		22.6							
1-Apr-11	10	22.5	7.84	6.4					
		22.5	7.89	6.6					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.6	8.16	6.4	312				
		22.6	8.16	6.5	310				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	8.13	6.5					
		22.8	8.09	6.1					
7-Apr-11	16	22.7		6.3					
		22.7		6.5					
8-Apr-11	17	22.7	8.22	6.2					
		22.7	8.21	6.1					
9-Apr-11	18	22.5		6.3					
		22.5		6.2					
10-Apr-11	19	23.3		6.5					
		23.5		6.2					
11-Apr-11	20	22.9	8.22	5.5	321				
		22.8	8.23	6.5	317				
12-Apr-11	21	22.9		6.7					
		23.0		6.4					
13-Apr-11	22	22.6	7.89	6.2					
		22.6	7.97	6.6					
14-Apr-11	23	22.6		6.5					
		22.6		7.0					
15-Apr-11	24	22.6	8.22	6.4					
		22.6	8.18	7.0					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	22.6	8.10	7.2	306				
		22.8	8.11	7.1	313				
19-Apr-11	28	22.6	8.13	6.9	312	122	152	0.00	U
		22.6	8.17	7.2	308				
Mean		**22.7**	**7.98**	**6.5**	**309**	**118**	**142**	**0.18**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.23**	**7.2**	**321**	**122**	**152**	**0.35**	
Min#		**22.3**	**7.62**	**5.5**	**300**	**114**	**132**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	10	10	8	7	7
Weight- (mg)	0.28500	0.22900	0.22000	0.25300	0.25800	0.31875	0.25429	0.21143
Biomass- (mg)	0.28500	0.22900	0.22000	0.25300	0.25800	0.25500	0.17800	0.14800

28-Day Percent Survival 90.0%
Avg. Weight- (mg) 0.25368
Avg. Biomass- (mg) 0.22825
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 1.5 (GLC No. 8889) Concentration: 80%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.60	5.8	299	116	136	0.23	
		22.3	7.60	5.9	300				
23-Mar-11	1	22.4	7.68	5.6					
		22.5	7.65	5.9					
24-Mar-11	2	22.9		5.4					
		23.0		5.6					
25-Mar-11	3	22.7	7.77	6.1					
		22.7	7.74	6.1					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	22.8	7.82	7.0	298				
		22.8	7.81	7.0	298				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.79	6.0					
		22.6	7.84	6.2					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.81	6.6					
		22.5	7.86	6.3					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.6	8.06	6.6	307				
		22.7	8.06	6.6	309				
5-Apr-11	14	22.7							
		22.7							
6-Apr-11	15	22.8	8.06	6.2					
		22.8	8.04	6.3					
7-Apr-11	16	22.6		6.5					
		22.7		6.3					
8-Apr-11	17	22.7	8.10	6.1					
		22.7	8.10	6.3					
9-Apr-11	18	22.6		6.3					
		22.6		6.4					
10-Apr-11	19	23.5		6.1					
		23.3		6.3					
11-Apr-11	20	22.9	8.18	5.9	318				
		22.9	8.17	6.0	319				
12-Apr-11	21	22.9		6.5					
		22.9		6.9					
13-Apr-11	22	22.6	7.93	6.9					
		22.6	8.01	6.5					
14-Apr-11	23	22.5		6.5					
		22.5		6.3					
15-Apr-11	24	22.5	8.17	6.7					
		22.5	8.16	6.7					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.4							
		22.5							
18-Apr-11	27	22.8	8.00	7.3	306				
		22.8	7.97	7.5	305				
19-Apr-11	28	22.5	8.16	7.6	295	122	132	0.00	
		22.6	8.10	7.4	305				
Mean		**22.7**	**7.94**	**6.4**	**305**	**119**	**134**	**0.12**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.18**	**7.6**	**319**	**122**	**136**	**0.23**	
Min#		**22.3**	**7.60**	**5.4**	**295**	**116**	**132**	**0.00**	

Replicate	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
# Surviving	8	8	8	8	9	9	8	8
Weight- (mg)	0.31000	0.23000	0.21125	0.24875	0.23444	0.25778	0.21500	0.16125
Biomass- (mg)	0.24800	0.18400	0.16900	0.19900	0.21100	0.23200	0.17200	0.12900

28-Day Percent Survival 82.5%
Avg. Weight- (mg) 0.23356
Avg. Biomass- (mg) 0.19300
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 1.5 (GLC No. 8889) Concentration: 100%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.54	5.6	293	112	140	0.18	
		22.4	7.55	5.7	293				
23-Mar-11	1	22.5	7.66	5.7					
		22.5	7.66	5.8					
24-Mar-11	2	23.0		6.0					
		23.0		5.8					
25-Mar-11	3	22.7	7.77	6.3					
		22.6	7.76	6.2					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	22.8	7.79	6.8	296				
		22.8	7.80	7.0	295				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.87	6.6					
		22.6	7.86	6.4					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.6	7.80	6.7					
		22.6	7.78	6.5					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.8							
4-Apr-11	13	22.6	8.07	6.3	305				
		22.6	8.05	6.4	306				
5-Apr-11	14	22.8							
		22.9							
6-Apr-11	15	22.8	8.00	6.1					
		22.8	8.02	6.5					
7-Apr-11	16	22.7		6.3					
		22.7		6.3					
8-Apr-11	17	22.7	8.11	6.5					
		22.7	8.02	6.3					
9-Apr-11	18	22.6		6.2					
		22.6		6.3					
10-Apr-11	19	23.3		**TE**					
		23.5		**TE**					
11-Apr-11	20	23.1	8.13	6.0	314				
		23.1	8.14	6.0	314				
12-Apr-11	21	22.9		6.6					
		22.9		6.8					
13-Apr-11	22	22.6	8.09	6.6					
		22.6	8.10	6.2					
14-Apr-11	23	22.5		6.6					
		22.5		6.7					
15-Apr-11	24	22.5	8.10	6.9					
		22.6	8.02	7.1					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.4							
		22.5							
18-Apr-11	27	22.9	7.98	7.7	304				
		22.9	7.96	7.5	303				
19-Apr-11	28	22.6	8.13	7.2	307	118	140	0.00	U
		22.6	8.11	7.2	305				
Mean		**22.7**	**7.92**	**6.5**	**303**	**115**	**140**	**0.09**	
Number		**58**	**28**	**38**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.14**	**7.7**	**314**	**118**	**140**	**0.18**	
Min#		**22.3**	**7.54**	**5.6**	**293**	**112**	**140**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	8	9	9	9	9	9	9	10
Weight- (mg)	0.22625	0.25444	0.21333	0.24111	0.21222	0.25556	0.23556	0.20300
Biomass- (mg)	0.18100	0.22900	0.19200	0.21700	0.19100	0.23000	0.21200	0.20300

28-Day Percent Survival 90.0%
Avg. Weight- (mg) 0.23018
Avg. Biomass- (mg) 0.20688
Average Weight of *H.azteca* at day 0: 0.01850mg

TE = Technician Error

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: CRM 2.5 (GLC No. 8892) Concentration: 10%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.58	6.5	324	128	144	0.70	
		22.3	7.63	6.7	318				
23-Mar-11	1	22.3	7.80	6.6					
		22.4	7.79	6.4					
24-Mar-11	2	23.0		5.8					
		22.9		5.9					
25-Mar-11	3	22.6	7.70	6.9					
		22.7	7.71	6.7					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	23.0	7.86	6.6	304				
		22.9	7.86	6.8	303				
29-Mar-11	7	22.7							
		22.6							
30-Mar-11	8	22.6	7.87	6.4					
		22.6	7.95	6.6					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.6	7.79	6.0					
		22.5	7.83	6.4					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.7	8.30	5.8	318				
		22.7	8.25	6.3	315				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	8.24	6.0					
		22.8	8.28	6.0					
7-Apr-11	16	22.7		6.1					
		22.7		5.5					
8-Apr-11	17	22.7	8.15	6.6					
		22.7	8.11	6.2					
9-Apr-11	18	22.6		6.3					
		22.6		6.1					
10-Apr-11	19	23.5		6.5					
		23.5		6.1					
11-Apr-11	20	22.9	8.30	6.6	327				
		22.8	8.25	5.7	324				
12-Apr-11	21	22.9		6.5					
		22.9		6.6					
13-Apr-11	22	22.6	8.23	7.4					
		22.6	8.25	6.2					
14-Apr-11	23	22.6		6.4					
		22.6		6.2					
15-Apr-11	24	22.6	8.25	6.6					
		22.6	8.19	6.4					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	22.6	8.09	7.3	319				
		22.7	8.17	7.5	312				
19-Apr-11	28	22.6	8.21	7.2	316	126	136	0.00	U
		22.6	8.25	7.3	320				
Mean		**22.7**	**8.03**	**6.4**	**317**	**127**	**140**	**0.35**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.30**	**7.5**	**327**	**128**	**144**	**0.70**	
Min#		**22.3**	**7.58**	**5.5**	**303**	**126**	**136**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	9	8	10	10	10	10	10	10
Weight- (mg)	0.31778	0.30875	0.33700	0.29200	0.39900	0.26400	0.27200	0.42000
Biomass- (mg)	0.28600	0.24700	0.33700	0.29200	0.39900	0.26400	0.27200	0.42000

28-Day Percent Survival 96.3%
Avg. Weight- (mg) 0.32632
Avg. Biomass- (mg) 0.31463
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 2.5 (GLC No. 8892) Concentration: 20%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.62	6.5	317	130	152	0.70	
		22.3	7.63	6.3	322				
23-Mar-11	1	22.3	7.81	6.3					
		22.5	7.81	6.5					
24-Mar-11	2	22.9		5.6					
		22.9		5.9					
25-Mar-11	3	22.7	7.75	6.3					
		22.7	7.74	6.6					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.7							
		22.8							
28-Mar-11	6	23.0	7.82	6.8	303				
		23.0	7.87	6.6	304				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.92	6.3					
		22.6	7.87	5.8					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.95	6.2					
		22.5	7.96	6.1					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.6	8.32	6.6	316				
		22.7	8.29	6.5	315				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	8.28	6.3					
		22.8	8.28	6.4					
7-Apr-11	16	22.6		6.6					
		22.6		6.0					
8-Apr-11	17	22.7	8.38	5.8					
		22.7	8.38	6.0					
9-Apr-11	18	22.6		6.0					
		22.6		6.0					
10-Apr-11	19	23.5		6.2					
		23.5		6.0					
11-Apr-11	20	22.9	8.33	5.9	326				
		22.9	8.32	6.1	323				
12-Apr-11	21	23.0		6.7					
		22.9		6.7					
13-Apr-11	22	22.6	8.25	6.4					
		22.6	8.26	6.5					
14-Apr-11	23	22.6		6.5					
		22.6		6.1					
15-Apr-11	24	22.6	8.18	6.7					
		22.6	8.17	6.9					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	22.6	8.12	7.2	313				
		22.7	8.22	7.4	314				
19-Apr-11	28	22.6	8.22	7.1	321	126	148	0.00	U
		22.6	8.21	7.2	316				
Mean		**22.7**	**8.07**	**6.4**	**316**	**128**	**150**	**0.35**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.38**	**7.4**	**326**	**130**	**152**	**0.70**	
Min#		**22.3**	**7.62**	**5.6**	**303**	**126**	**148**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	8	9	10	10	10
Weight- (mg)	0.32800	0.32300	0.36900	0.35875	0.30667	0.28200	0.38300	0.45300
Biomass- (mg)	0.32800	0.32300	0.36900	0.28700	0.27600	0.28200	0.38300	0.45300

28-Day Percent Survival 96.3%
Avg. Weight- (mg) 0.35043
Avg. Biomass- (mg) 0.33763
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 2.5 (GLC No. 8892) Concentration: 40%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.4	7.68	6.3	313	124	140	0.67	
		22.4	7.66	6.4	311				
23-Mar-11	1	22.4	7.71	6.5					
		22.5	7.72	6.2					
24-Mar-11	2	22.9		5.8					
		22.9		6.0					
25-Mar-11	3	22.7	7.80	6.4					
		22.7	7.78	6.2					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.8							
		22.9							
28-Mar-11	6	22.9	7.86	6.9	303				
		22.9	7.85	6.9	303				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.93	6.2					
		22.6	7.95	6.1					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.93	6.5					
		22.5	7.91	6.6					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.7	8.27	6.3	315				
		22.7	8.28	6.4	313				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	8.21	6.1					
		22.8	8.25	6.3					
7-Apr-11	16	22.7		6.2					
		22.6		6.3					
8-Apr-11	17	22.7	8.27	6.0					
		22.7	8.28	6.0					
9-Apr-11	18	22.6		6.1					
		22.6		6.1					
10-Apr-11	19	23.5		6.1					
		23.5		6.2					
11-Apr-11	20	22.9	8.25	5.5	322				
		22.9	8.32	5.7	325				
12-Apr-11	21	23.0		6.6					
		23.0		6.5					
13-Apr-11	22	22.6	8.17	6.4					
		22.6	8.20	6.3					
14-Apr-11	23	22.6		6.4					
		22.6		6.6					
15-Apr-11	24	22.6	8.14	6.9					
		22.6	8.17	6.6					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.4							
		22.4							
18-Apr-11	27	22.7	8.15	7.4	311				
		22.7	8.12	7.3	309				
19-Apr-11	28	22.6	8.21	7.5	315	122	136	0.00	U
		22.7	8.15	7.0	316				
Mean		**22.7**	**8.04**	**6.4**	**313**	**123**	**138**	**0.34**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.32**	**7.5**	**325**	**124**	**140**	**0.67**	
Min#		**22.4**	**7.66**	**5.5**	**303**	**122**	**136**	**0.00**	

Replicate	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
# Surviving	10	10	9	10	8	10	10	10
Weight- (mg)	0.27000	0.19500	0.33778	0.24400	0.28500	0.28600	0.27500	0.33200
Biomass- (mg)	0.27000	0.19500	0.30400	0.24400	0.22800	0.28600	0.27500	0.33200

28-Day Percent Survival 96.3%
Avg. Weight- (mg) 0.27810
Avg. Biomass- (mg) 0.26675
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 2.5 (GLC No. 8892) Concentration: 60%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.61	6.2	305	122	140	0.46	
		22.4	7.62	6.3	306				
23-Mar-11	1	22.5	7.71	6.0					
		22.4	7.72	6.1					
24-Mar-11	2	22.9		6.1					
		22.9		6.1					
25-Mar-11	3	22.6	7.78	6.2					
		22.6	7.78	6.4					
26-Mar-11	4	22.6							
		22.5							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	22.9	7.84	6.9	301				
		22.9	7.90	7.1	300				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.95	6.5					
		22.6	7.97	6.1					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	7.93	6.7					
		22.5	7.90	6.6					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.7	8.18	6.4	312				
		22.7	8.19	6.5	315				
5-Apr-11	14	22.9							
		22.9							
6-Apr-11	15	22.8	8.15	6.5					
		22.8	8.12	6.0					
7-Apr-11	16	22.6		5.8					
		22.6		6.3					
8-Apr-11	17	22.7	8.31	6.4					
		22.7	8.25	6.1					
9-Apr-11	18	22.6		6.2					
		22.6		5.9					
10-Apr-11	19	23.5		6.5					
		23.5		6.0					
11-Apr-11	20	22.9	8.24	5.6	325				
		23.0	8.00	5.1	320				
12-Apr-11	21	22.9		6.6					
		22.9		6.7					
13-Apr-11	22	22.6	8.16	6.1					
		22.6	8.15	6.1					
14-Apr-11	23	22.5		6.4					
		22.5		6.5					
15-Apr-11	24	22.5	8.14	6.7					
		22.6	8.16	6.9					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.4							
		22.4							
18-Apr-11	27	22.6	8.10	7.5	306				
		22.7	8.11	7.4	315				
19-Apr-11	28	22.7	8.03	6.9	315	120	144	0.00	U
		22.6	8.06	6.8	306				
Mean		**22.7**	**8.00**	**6.4**	**311**	**121**	**142**	**0.23**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.31**	**7.5**	**325**	**122**	**144**	**0.46**	
Min#		**22.3**	**7.61**	**5.1**	**300**	**120**	**140**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	9	10	10	9	9	10	10
Weight- (mg)	0.24800	0.28333	0.20100	0.21300	0.32778	0.29222	0.25000	0.25100
Biomass- (mg)	0.24800	0.25500	0.20100	0.21300	0.29500	0.26300	0.25000	0.25100

28-Day Percent Survival 96.3%
Avg. Weight- (mg) 0.25829
Avg. Biomass- (mg) 0.24700
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 2.5 (GLC No. 8892) Concentration: 80%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.61	6.1	302	120	140	0.32	
		22.3	7.61	6.2	300				
23-Mar-11	1	22.5	7.71	6.1					
		22.5	7.72	6.3					
24-Mar-11	2	22.9		6.5					
		22.9		6.2					
25-Mar-11	3	22.6	7.78	6.5					
		22.6	7.79	6.5					
26-Mar-11	4	22.5							
		22.6							
27-Mar-11	5	22.8							
		22.8							
28-Mar-11	6	23.0	7.88	6.6	299				
		23.0	7.88	6.7	300				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.87	7.2					
		22.6	7.85	6.1					
31-Mar-11	9	22.6							
		22.5							
1-Apr-11	10	22.5	7.86	6.3					
		22.5	7.85	6.1					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.6	8.17	6.1	309				
		22.6	8.14	6.2	310				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	8.10	6.5					
		22.8	8.14	6.0					
7-Apr-11	16	22.6		6.1					
		22.5		6.3					
8-Apr-11	17	22.7	8.20	6.0					
		22.7	8.14	6.3					
9-Apr-11	18	22.6		5.9					
		22.6		5.8					
10-Apr-11	19	23.5		6.1					
		23.5		5.9					
11-Apr-11	20	23.0	8.24	5.6	325				
		23.1	8.22	5.8	324				
12-Apr-11	21	22.8		7.1					
		22.9		6.7					
13-Apr-11	22	22.6	8.19	7.2					
		22.6	8.16	7.3					
14-Apr-11	23	22.5		6.4					
		22.5		5.7					
15-Apr-11	24	22.4	8.17	6.9					
		22.6	8.11	7.1					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.3							
		22.4							
18-Apr-11	27	22.7	8.09	7.5	305				
		22.7	8.06	7.2	311				
19-Apr-11	28	22.6	8.03	7.1	308	120	156	0.00	U
		22.6	8.11	7.2	309				
Mean		**22.7**	**7.99**	**6.4**	**309**	**120**	**148**	**0.16**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.24**	**7.5**	**325**	**120**	**156**	**0.32**	
Min#		**22.3**	**7.61**	**5.6**	**299**	**120**	**140**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	9	10	10	10	10	10	10	10
Weight- (mg)	0.30222	0.19300	0.23700	0.21300	0.25700	0.29900	0.25100	0.21000
Biomass- (mg)	0.27200	0.19300	0.23700	0.21300	0.25700	0.29900	0.25100	0.21000

28-Day Percent Survival 98.8%
Avg. Weight- (mg) 0.24528
Avg. Biomass- (mg) 0.24150
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 2.5 (GLC No. 8892) Concentration: 100%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.3	7.61	6.2	298	120	128	0.24	
		22.3	7.60	6.2	295				
23-Mar-11	1	22.3	7.72	6.3					
		22.3	7.68	6.1					
24-Mar-11	2	22.9		6.3					
		22.9		6.5					
25-Mar-11	3	22.6	7.80	6.3					
		22.6	7.79	6.6					
26-Mar-11	4	22.5							
		22.5							
27-Mar-11	5	22.7							
		22.7							
28-Mar-11	6	22.6	7.88	6.7	297				
		22.7	7.86	6.8	297				
29-Mar-11	7	22.6							
		22.6							
30-Mar-11	8	22.6	7.93	6.6					
		22.6	7.91	5.9					
31-Mar-11	9	22.5							
		22.4							
1-Apr-11	10	22.5	7.82	6.0					
		22.4	7.80	6.0					
2-Apr-11	11	22.8							
		22.8							
3-Apr-11	12	22.7							
		22.7							
4-Apr-11	13	22.6	8.03	6.1	307				
		22.6	8.12	6.2	309				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	8.05	6.1					
		22.8	7.95	6.0					
7-Apr-11	16	22.5		6.3					
		22.5		6.4					
8-Apr-11	17	22.7	8.14	6.2					
		22.7	8.18	6.2					
9-Apr-11	18	22.6		6.0					
		22.6		5.5					
10-Apr-11	19	23.5		5.8					
		23.5		5.6					
11-Apr-11	20	22.9	7.96	5.4	317				
		23.0	8.12	5.8	323				
12-Apr-11	21	22.8		6.4					
		22.8		6.5					
13-Apr-11	22	22.5	8.09	6.0					
		22.5	8.09	5.4					
14-Apr-11	23	22.5		6.1					
		22.5		6.1					
15-Apr-11	24	22.6	8.05	6.6					
		22.6	8.03	6.9					
16-Apr-11	25	22.5							
		22.5							
17-Apr-11	26	22.2							
		22.2							
18-Apr-11	27	22.6	7.99	7.0	305				
		22.6	7.82	6.5	297				
19-Apr-11	28	22.6	8.08	7.2	306	124	120	0.00	U
		22.6	8.18	7.1	318				
Mean		**22.6**	**7.94**	**6.2**	**306**	**122**	**124**	**0.12**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.5**	**8.18**	**7.2**	**323**	**124**	**128**	**0.24**	
Min#		**22.2**	**7.60**	**5.4**	**295**	**120**	**120**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	8	10	10	9	10	9
Weight- (mg)	0.31000	0.27300	0.31125	0.22900	0.26400	0.24111	0.26300	0.26778
Biomass- (mg)	0.31000	0.27300	0.24900	0.22900	0.26400	0.21700	0.26300	0.24100

28-Day Percent Survival 95.0%
Avg. Weight- (mg) 0.26989
Avg. Biomass- (mg) 0.25575
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 3.0 (GLC No. 8893) Concentration: 10%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.72	6.4	323	128	152	0.72	
		22.1	7.71	6.4	323				
23-Mar-11	1	22.7	7.78	6.3					
		22.7	7.80	6.2					
24-Mar-11	2	22.8		6.3					
		22.8		6.1					
25-Mar-11	3	22.9	7.82	6.4					
		22.9	7.81	6.4					
26-Mar-11	4	22.8							
		22.7							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	23.1	7.68	7.4	303				
		23.1	7.65	7.4	302				
29-Mar-11	7	22.8							
		22.8							
30-Mar-11	8	22.5	7.77	6.4					
		22.5	7.79	6.9					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	8.02	6.7					
		22.5	8.09	6.9					
2-Apr-11	11	23.0							
		23.0							
3-Apr-11	12	22.9							
		23.0							
4-Apr-11	13	22.7	8.35	6.2	319				
		22.7	8.36	6.4	317				
5-Apr-11	14	22.9							
		22.9							
6-Apr-11	15	22.8	8.26	6.5					
		22.8	8.47	6.2					
7-Apr-11	16	22.7		7.0					
		22.6		6.3					
8-Apr-11	17	22.6	8.21	6.0					
		22.6	8.39	6.6					
9-Apr-11	18	22.4		6.8					
		22.4		6.4					
10-Apr-11	19	23.0		6.4					
		23.0		6.3					
11-Apr-11	20	22.9	8.13	6.0	323				
		22.9	8.28	6.2	328				
12-Apr-11	21	23.1		7.1					
		23.1		6.7					
13-Apr-11	22	22.6	8.06	5.9					
		22.6	8.13	6.5					
14-Apr-11	23	22.6		6.6					
		22.6		7.1					
15-Apr-11	24	22.8	8.12	7.2					
		23.0	8.09	7.4					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	22.8	8.14	7.0	312				
		22.9	8.12	7.2	311				
19-Apr-11	28	22.6	8.19	7.7	321	122	140	0.00	U
		22.6	8.18	7.6	321				
Mean		**22.7**	**8.04**	**6.6**	**317**	**125**	**146**	**0.36**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.47**	**7.7**	**328**	**128**	**152**	**0.72**	
Min#		**22.1**	**7.65**	**5.9**	**302**	**122**	**140**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	9	10	10	10	10	10	10	10
Weight- (mg)	0.31222	0.25400	0.29700	0.16800	0.32600	0.23900	0.46100	0.34700
Biomass- (mg)	0.28100	0.25400	0.29700	0.16800	0.32600	0.23900	0.46100	0.34700

28-Day Percent Survival 98.8%
Avg. Weight- (mg) 0.30053
Avg. Biomass- (mg) 0.29663
Average Weight of *H.azteca* at day 0: 0.01850mg

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

red outlined cells indicate corrected data entry error

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 3.0 (GLC No. 8893) Concentration: 20%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.1	7.72	6.2	328	130	152	0.89	
		22.1	7.68	6.3	325				
23-Mar-11	1	22.7	7.81	6.2					
		22.7	7.80	6.2					
24-Mar-11	2	22.8		6.4					
		22.8		6.4					
25-Mar-11	3	22.9	7.80	6.1					
		22.9	7.80	6.2					
26-Mar-11	4	22.7							
		22.7							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	23.0	7.65	7.0	305				
		23.0	7.67	7.0	307				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.5	7.84	6.6					
		22.5	7.88	6.7					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.5	8.07	6.9					
		22.5	8.09	6.9					
2-Apr-11	11	23.0							
		23.0							
3-Apr-11	12	23.0							
		22.9							
4-Apr-11	13	22.7	8.39	6.7	321				
		22.7	8.38	6.5	323				
5-Apr-11	14	23.2							
		22.9							
6-Apr-11	15	22.9	8.29	6.3					
		22.9	8.39	5.9					
7-Apr-11	16	22.7		6.8					
		22.7		6.9					
8-Apr-11	17	22.6	8.45	6.8					
		22.6	8.39	6.7					
9-Apr-11	18	22.4		6.8					
		22.5		5.9					
10-Apr-11	19	23.0		6.5					
		23.0		6.4					
11-Apr-11	20	22.9	8.34	5.7	334				
		22.9	8.35	5.9	335				
12-Apr-11	21	23.1		7.2					
		23.1		7.0					
13-Apr-11	22	22.6	8.15	7.1					
		22.6	8.13	6.5					
14-Apr-11	23	22.7		7.0					
		22.7		6.7					
15-Apr-11	24	23.0	8.14	7.0					
		23.0	8.20	7.2					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.4							
		22.5							
18-Apr-11	27	22.6	8.12	7.2	317				
		22.9	8.11	7.0	318				
19-Apr-11	28	22.7	8.24	7.8	312	122	136	0.00	U
		22.7	8.30	7.7	314				
Mean		**22.7**	**8.08**	**6.7**	**320**	**126**	**144**	**0.45**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.2**	**8.45**	**7.8**	**335**	**130**	**152**	**0.89**	
Min#		**22.1**	**7.65**	**5.7**	**305**	**122**	**136**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	10	8	10	10	10
Weight- (mg)	0.20900	0.25400	0.39900	0.20900	0.33875	0.26300	0.33400	0.31100
Biomass- (mg)	0.20900	0.25400	0.39900	0.20900	0.27100	0.26300	0.33400	0.31100

28-Day Percent Survival 97.5%
Avg. Weight- (mg) 0.28972
Avg. Biomass- (mg) 0.28125
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 3.0 (GLC No. 8893) Concentration: 40%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.1	7.66	6.2	328	132	156	0.76	
		22.2	7.65	6.1	331				
23-Mar-11	1	22.7	7.81	5.9					
		22.7	7.71	5.7					
24-Mar-11	2	22.8		6.2					
		22.9		5.9					
25-Mar-11	3	22.9	7.76	5.8					
		22.8	7.76	6.1					
26-Mar-11	4	22.6							
		22.7							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	22.9	7.69	7.2	309				
		23.0	7.69	7.2	305				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.5	7.94	6.3					
		22.5	7.97	6.3					
31-Mar-11	9	22.5							
		22.6							
1-Apr-11	10	22.4	8.06	6.5					
		22.5	8.10	6.6					
2-Apr-11	11	23.0							
		23.0							
3-Apr-11	12	22.9							
		22.9							
4-Apr-11	13	22.6	8.41	6.7	328				
		22.6	8.46	6.7	322				
5-Apr-11	14	22.9							
		22.9							
6-Apr-11	15	22.9	8.36	6.3					
		22.9	8.38	6.2					
7-Apr-11	16	22.7		6.4					
		22.7		6.3					
8-Apr-11	17	22.6	8.39	6.2					
		22.6	8.39	6.5					
9-Apr-11	18	22.5		6.1					
		22.5		6.4					
10-Apr-11	19	23.0		6.0					
		23.0		5.6					
11-Apr-11	20	23.0	8.25	5.8	335				
		22.9	8.26	6.0	334				
12-Apr-11	21	23.1		6.6					
		23.1		6.6					
13-Apr-11	22	22.6	8.09	7.0					
		22.6	8.05	7.2					
14-Apr-11	23	22.7		6.7					
		22.7		6.4					
15-Apr-11	24	22.9	8.21	6.7					
		22.8	8.22	7.1					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	22.7	8.07	7.3	312				
		22.8	8.02	7.1	314				
19-Apr-11	28	22.7	8.22	7.5	314	120	132	0.00	U
		22.6	8.18	7.4	311				
Mean		**22.7**	**8.06**	**6.5**	**320**	**126**	**144**	**0.38**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.46**	**7.5**	**335**	**132**	**156**	**0.76**	
Min#		**22.1**	**7.65**	**5.6**	**305**	**120**	**132**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	10	10	10	10	10
Weight- (mg)	0.42500	0.50500	0.36600	0.37600	0.39700	0.32200	0.34700	0.28200
Biomass- (mg)	0.42500	0.50500	0.36600	0.37600	0.39700	0.32200	0.34700	0.28200

28-Day Percent Survival 100.0%
Avg. Weight- (mg) 0.37750
Avg. Biomass- (mg) 0.37750
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 3.0 (GLC No. 8893) Concentration: 60%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.65	6.0	333	138	156	0.79	
		22.2	7.66	6.0	328				
23-Mar-11	1	22.7	7.73	6.3					
		22.7	7.71	5.9					
24-Mar-11	2	22.9		5.9					
		22.9		6.0					
25-Mar-11	3	22.8	7.76	6.2					
		22.8	7.77	6.0					
26-Mar-11	4	22.7							
		22.7							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	23.0	7.72	7.2	305				
		23.0	7.78	7.2	305				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.5	8.08	5.9					
		22.5	8.15	5.9					
31-Mar-11	9	22.6							
		22.6							
1-Apr-11	10	22.6	8.14	6.6					
		22.5	8.10	6.6					
2-Apr-11	11	23.0							
		23.0							
3-Apr-11	12	22.9							
		23.0							
4-Apr-11	13	22.6	8.53	6.7	327				
		22.7	8.50	6.6	327				
5-Apr-11	14	23.0							
		23.0							
6-Apr-11	15	22.9	8.35	6.1					
		22.9	8.49	5.9					
7-Apr-11	16	22.7		6.0					
		22.7		6.3					
8-Apr-11	17	22.6	8.44	6.3					
		22.6	8.46	6.2					
9-Apr-11	18	22.4		6.0					
		22.4		5.4					
10-Apr-11	19	23.0		5.8					
		23.0		6.3					
11-Apr-11	20	23.1	8.24	5.3	355				
		23.1	8.25	5.6	348				
12-Apr-11	21	23.1		6.9					
		23.1		6.8					
13-Apr-11	22	22.6	7.81	6.5					
		22.6	8.02	6.1					
14-Apr-11	23	22.7		6.7					
		22.7		6.8					
15-Apr-11	24	23.0	8.20	7.0					
		22.9	8.24	6.9					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.3							
		22.5							
18-Apr-11	27	22.7	7.98	7.0	312				
		22.9	8.02	6.5	314				
19-Apr-11	28	22.6	8.08	7.4	304	122	136	0.00	U
		22.6	8.01	7.4	302				
Mean		**22.7**	**8.07**	**6.4**	**322**	**130**	**146**	**0.40**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.53**	**7.4**	**355**	**138**	**156**	**0.79**	
Min#		**22.2**	**7.65**	**5.3**	**302**	**122**	**136**	**0.00**	

Replicate	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
# Surviving	10	10	10	10	10	9	10	5
Weight- (mg)	0.33800	0.24700	0.27800	0.24300	0.29800	0.31778	0.34000	0.42400
Biomass- (mg)	0.33800	0.24700	0.27800	0.24300	0.29800	0.28600	0.34000	0.21200

28-Day Percent Survival 92.5%
Avg. Weight- (mg) 0.31072
Avg. Biomass- (mg) 0.28025
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 3.0 (GLC No. 8893) Concentration: 80%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.65	5.9	338	142	156	0.79	
		22.2	7.66	5.7	343				
23-Mar-11	1	22.7	7.68	5.9					
		22.7	7.69	5.7					
24-Mar-11	2	22.9		5.8					
		22.9		5.9					
25-Mar-11	3	22.8	7.74	5.9					
		22.9	7.75	5.9					
26-Mar-11	4	22.7							
		22.7							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	23.1	7.78	7.1	308				
		23.1	7.77	7.1	306				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.4	8.17	6.3					
		22.4	8.24	6.0					
31-Mar-11	9	22.6							
		22.5							
1-Apr-11	10	22.5	8.14	6.4					
		22.5	8.13	6.6					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	22.9							
		22.9							
4-Apr-11	13	22.7	8.51	6.8	336				
		22.7	8.51	6.5	331				
5-Apr-11	14	22.9							
		22.9							
6-Apr-11	15	22.9	8.37	5.9					
		22.8	8.44	6.0					
7-Apr-11	16	22.7		5.9					
		22.7		5.8					
8-Apr-11	17	22.6	8.38	6.0					
		22.6	8.44	6.1					
9-Apr-11	18	22.4		5.7					
		22.5		5.2					
10-Apr-11	19	23.0		6.1					
		23.0		6.0					
11-Apr-11	20	23.1	8.25	4.7	330				
		23.1	8.21	5.3	335				
12-Apr-11	21	23.1		6.8					
		23.2		6.4					
13-Apr-11	22	22.6	8.00	6.0					
		22.6	8.05	6.0					
14-Apr-11	23	22.6		6.7					
		22.6		6.5					
15-Apr-11	24	22.9	8.23	6.9					
		22.8	8.20	6.6					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.4							
		22.5							
18-Apr-11	27	22.8	7.95	7.0	313				
		22.8	8.02	7.1	318				
19-Apr-11	28	22.6	7.94	7.2	301	124	132	0.00	U
		22.7	7.99	7.2	300				
Mean		**22.7**	**8.07**	**6.2**	**322**	**133**	**144**	**0.40**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.2**	**8.51**	**7.2**	**343**	**142**	**156**	**0.79**	
Min#		**22.2**	**7.65**	**4.7**	**300**	**124**	**132**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	9	8	10	10	10	10	8	10
Weight- (mg)	0.33556	0.33250	0.25400	0.28200	0.29400	0.24000	0.32625	0.23100
Biomass- (mg)	0.30200	0.26600	0.25400	0.28200	0.29400	0.24000	0.26100	0.23100

28-Day Percent Survival 93.8%
Avg. Weight- (mg) 0.28691
Avg. Biomass- (mg) 0.26625
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 3.0 (GLC No. 8893) Concentration: 100%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.68	5.7	338	140	152	0.76	
		22.2	7.67	5.8	340				
23-Mar-11	1	22.6	7.68	5.7					
		22.7	7.68	5.7					
24-Mar-11	2	22.9		5.9					
		22.9		5.6					
25-Mar-11	3	22.9	7.74	5.5					
		22.8	7.74	5.7					
26-Mar-11	4	22.7							
		22.7							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	23.1	7.79	7.2	307				
		23.1	7.80	7.4	309				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.4	8.18	5.3					
		22.4	8.18	5.3					
31-Mar-11	9	22.6							
		22.5							
1-Apr-11	10	22.5	8.16	6.4					
		22.5	8.19	6.3					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	22.9							
		23.0							
4-Apr-11	13	22.7	8.52	6.7	329				
		22.7	8.54	6.7	330				
5-Apr-11	14	22.9							
		22.9							
6-Apr-11	15	22.9	8.47	5.6					
		22.9	8.44	5.9					
7-Apr-11	16	22.7		5.9					
		22.7		6.0					
8-Apr-11	17	22.6	8.50	5.1					
		22.6	8.48	5.7					
9-Apr-11	18	22.4		5.4					
		22.4		5.3					
10-Apr-11	19	23.0		5.8					
		23.0		6.0					
11-Apr-11	20	23.1	8.25	5.6	341				
		23.1	8.23	5.2	336				
12-Apr-11	21	23.2		5.9					
		23.1		5.9					
13-Apr-11	22	22.6	8.09	5.6					
		22.6	8.16	6.3					
14-Apr-11	23	22.6		5.9					
		22.6		6.0					
15-Apr-11	24	22.9	8.21	5.7					
		22.9	8.17	5.8					
16-Apr-11	25	22.7							
		22.7							
17-Apr-11	26	22.3							
		22.3							
18-Apr-11	27	22.8	8.06	6.3	319				
		22.9	7.98	6.9	322				
19-Apr-11	28	22.6	7.93	7.2	299	126	128	0.00	U
		22.6	7.97	7.5	298				
Mean		**22.7**	**8.09**	**6.0**	**322**	**133**	**140**	**0.38**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.2**	**8.54**	**7.5**	**341**	**140**	**152**	**0.76**	
Min#		**22.2**	**7.67**	**5.1**	**298**	**126**	**128**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	10	9	10	9	10
Weight- (mg)	0.21800	0.22600	0.27700	0.29500	0.31778	0.23800	0.30111	0.27700
Biomass- (mg)	0.21800	0.22600	0.27700	0.29500	0.28600	0.23800	0.27100	0.27700

28-Day Percent Survival 97.5%
Avg. Weight- (mg) 0.26874
Avg. Biomass- (mg) 0.26100
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 4.5 (GLC No. 8896) Concentration: 10%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.38	6.3	320	130	148	0.67	
		22.2	7.40	6.3	322				
23-Mar-11	1	22.7	7.65	6.2					
		22.7	7.77	6.5					
24-Mar-11	2	23.0		6.4					
		23.0		6.2					
25-Mar-11	3	22.9	7.74	6.6					
		22.9	7.75	6.4					
26-Mar-11	4	22.6							
		22.7							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	23.0	7.54	7.1	304				
		23.1	7.55	7.0	303				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.4	8.15	6.7					
		22.4	8.10	6.7					
31-Mar-11	9	22.5							
		22.6							
1-Apr-11	10	22.5	7.87	6.9					
		22.5	7.84	6.7					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.6	8.12	6.7	312				
		22.7	8.19	6.8	**TE**				
5-Apr-11	14	22.9							
		23.1							
6-Apr-11	15	22.9	8.24	6.7					
		22.9	8.23	6.7					
7-Apr-11	16	22.7		6.8					
		22.7		6.6					
8-Apr-11	17	22.6	8.42	7.0					
		22.6	8.38	5.8					
9-Apr-11	18	22.4		6.0					
		22.4		6.5					
10-Apr-11	19	23.0		6.4					
		23.0		6.1					
11-Apr-11	20	23.1	8.25	6.6	325				
		23.1	8.27	6.2	322				
12-Apr-11	21	23.1		6.8					
		23.1		7.1					
13-Apr-11	22	22.6	8.19	7.0					
		22.7	8.16	7.2					
14-Apr-11	23	22.6		6.8					
		22.6		7.0					
15-Apr-11	24	22.7	8.25	7.2					
		22.5	8.21	7.3					
16-Apr-11	25	22.6							
		22.6							
17-Apr-11	26	22.3							
		22.4							
18-Apr-11	27	22.9	8.13	7.4	312				
		23.0	8.11	7.6	310				
19-Apr-11	28	22.6	8.19	6.7	318	124	140	0.00	U
		22.7	8.19	7.0	317				
Mean		**22.7**	**8.01**	**6.7**	**315**	**127**	**144**	**0.34**	
Number		**58**	**28**	**40**	**11**	**2**	**2**	**2**	
Max #		**23.1**	**8.42**	**7.6**	**325**	**130**	**148**	**0.67**	
Min#		**22.2**	**7.38**	**5.8**	**303**	**124**	**140**	**0.00**	

Replicate	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
# Surviving	9	10	10	10	10	10	10	10
Weight- (mg)	0.33889	0.21000	0.49600	0.26200	0.42600	0.27900	0.16500	0.45200
Biomass- (mg)	0.30500	0.21000	0.49600	0.26200	0.42600	0.27900	0.16500	0.45200

28-Day Percent Survival 98.8%
Avg. Weight- (mg) 0.32861
Avg. Biomass- (mg) 0.32438
Average Weight of *H.azteca* at day 0: 0.01850mg

TE = Technician Error

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: CRM 4.5 (GLC No. 8896) Concentration: 20%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.53	6.4	318	128	140	0.63	
		22.2	7.54	6.4	319				
23-Mar-11	1	22.7	7.79	6.4					
		22.6	7.78	6.3					
24-Mar-11	2	23.0		6.3					
		23.0		6.3					
25-Mar-11	3	22.8	7.81	6.6					
		22.8	7.81	6.4					
26-Mar-11	4	22.6							
		22.6							
27-Mar-11	5	22.5							
		22.5							
28-Mar-11	6	23.0	7.77	7.0	306				
		23.1	7.87	7.4	304				
29-Mar-11	7	22.8							
		22.8							
30-Mar-11	8	22.4	8.06	6.4					
		22.4	8.05	6.6					
31-Mar-11	9	22.5							
		22.5							
1-Apr-11	10	22.5	7.88	6.9					
		22.5	7.88	7.0					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.6	8.19	6.4	312				
		22.6	8.19	6.8	311				
5-Apr-11	14	23.0							
		22.9							
6-Apr-11	15	22.9	8.19	6.6					
		22.9	8.19	6.5					
7-Apr-11	16	22.7		7.4					
		22.7		7.1					
8-Apr-11	17	22.6	8.24	6.1					
		22.6	8.27	6.4					
9-Apr-11	18	22.4		6.5					
		22.4		6.2					
10-Apr-11	19	23.0		6.3					
		23.1		6.7					
11-Apr-11	20	23.1	8.22	6.0	323				
		23.1	8.25	6.4	323				
12-Apr-11	21	23.1		7.2					
		23.1		7.3					
13-Apr-11	22	22.6	8.09	5.8					
		22.7	8.15	6.1					
14-Apr-11	23	22.6		7.1					
		22.6		7.3					
15-Apr-11	24	22.4	8.14	7.0					
		22.5	8.09	7.2					
16-Apr-11	25	22.6							
		22.6							
17-Apr-11	26	22.3							
		22.5							
18-Apr-11	27	23.0	8.16	7.4	316				
		23.1	8.13	6.9	313				
19-Apr-11	28	22.7	8.19	7.3	318	120	152	0.00	U
		22.7	8.20	7.4	310	116	148	0.00	
Mean		**22.7**	**8.02**	**6.7**	**314**	**121**	**147**	**0.21**	
Number		**58**	**28**	**40**	**12**	**3**	**3**	**3**	
Max #		**23.1**	**8.27**	**7.4**	**323**	**128**	**152**	**0.63**	
Min#		**22.2**	**7.53**	**5.8**	**304**	**116**	**140**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	9	10	10	9	10	10	10	10
Weight- (mg)	0.38667	0.27600	0.28900	0.35889	0.39500	0.37900	0.31800	0.22300
Biomass- (mg)	0.34800	0.27600	0.28900	0.32300	0.39500	0.37900	0.31800	0.22300

28-Day Percent Survival 97.5%
Avg. Weight- (mg) 0.32820
Avg. Biomass- (mg) 0.31888
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 4.5 (GLC No. 8896) Concentration: 40%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.1	7.58	6.3	319	124	144	0.47	
		22.1	7.58	6.4	318				
23-Mar-11	1	22.6	7.78	6.1					
		22.7	7.75	6.2					
24-Mar-11	2	23.0		6.4					
		23.0		6.3					
25-Mar-11	3	22.8	7.82	6.3					
		22.8	7.81	6.4					
26-Mar-11	4	22.7							
		22.6							
27-Mar-11	5	22.4							
		22.4							
28-Mar-11	6	23.1	7.87	7.1	306				
		23.1	7.87	7.4	306				
29-Mar-11	7	22.8							
		22.8							
30-Mar-11	8	22.4	8.14	6.4					
		22.5	8.09	6.4					
31-Mar-11	9	22.5							
		22.4							
1-Apr-11	10	22.5	7.86	7.0					
		22.5	7.87	6.9					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.7	8.10	6.5	308				
		22.7	8.14	6.4	309				
5-Apr-11	14	22.9							
		22.8							
6-Apr-11	15	22.9	8.06	5.6					
		22.9	8.03	5.7					
7-Apr-11	16	22.7		7.3					
		22.7		6.9					
8-Apr-11	17	22.6	7.99	6.8					
		22.6	8.11	6.5					
9-Apr-11	18	22.3		6.3					
		22.3		6.8					
10-Apr-11	19	23.0		6.4					
		23.0		6.6					
11-Apr-11	20	23.1	8.13	6.4	312				
		23.1	8.14	6.5	316				
12-Apr-11	21	23.1		6.5					
		23.0		7.1					
13-Apr-11	22	22.6	8.10	7.2					
		22.6	8.11	6.9					
14-Apr-11	23	22.5		7.5					
		22.5		7.6					
15-Apr-11	24	22.7	8.08	7.1					
		22.6	8.10	7.4					
16-Apr-11	25	22.6							
		22.6							
17-Apr-11	26	22.5							
		22.5							
18-Apr-11	27	23.0	8.08	7.3	305				
		23.1	8.07	7.5	306				
19-Apr-11	28	22.7	8.15	7.1	317	118	144	0.00	U
		22.7	8.14	6.9	315				
Mean		**22.7**	**7.98**	**6.7**	**311**	**121**	**144**	**0.24**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.15**	**7.6**	**319**	**124**	**144**	**0.47**	
Min#		**22.1**	**7.58**	**5.6**	**305**	**118**	**144**	**0.00**	

Replicate	**1**	**2**	**3**	**4***	**5**	**6**	**7**	**8**
# Surviving	9	8	10	10	10	10	10	4
Weight- (mg)	0.34556	0.22125	0.28200	0.22625	0.22800	0.26400	0.24300	0.28000
Biomass- (mg)	0.31100	0.17700	0.28200	0.22625	0.22800	0.26400	0.24300	0.11200

* Tech error; dropped pan from replicate 4. Only recovered 8 of the 10 surviving; weights are calculated with only 8 organisms

28-Day Percent Survival 88.8%
Avg. Weight- (mg) 0.26126
Avg. Biomass- (mg) 0.23041
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 4.5 (GLC No. 8896) Concentration: 60%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.1	7.60	6.1	312	122	148	0.32	
		22.2	7.60	6.3	315				
23-Mar-11	1	22.7	7.79	6.2					
		22.7	7.80	6.2					
24-Mar-11	2	23.0		6.3					
		23.0		6.3					
25-Mar-11	3	22.8	7.83	6.5					
		22.9	7.84	6.3					
26-Mar-11	4	22.7							
		22.7							
27-Mar-11	5	22.4							
		22.3							
28-Mar-11	6	23.1	7.86	7.4	304				
		23.0	7.86	7.4	303				
29-Mar-11	7	22.7							
		22.8							
30-Mar-11	8	22.5	8.06	6.1					
		22.5	8.09	6.5					
31-Mar-11	9	22.3							
		22.4							
1-Apr-11	10	22.5	7.84	6.7					
		22.5	7.80	6.6					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.6	8.08	6.7	306				
		22.6	8.08	6.3	307				
5-Apr-11	14	22.9							
		22.9							
6-Apr-11	15	22.9	7.95	6.5					
		22.9	8.02	6.7					
7-Apr-11	16	22.7		6.7					
		22.7		7.0					
8-Apr-11	17	22.6	8.08	6.8					
		22.6	8.08	6.6					
9-Apr-11	18	22.3		6.3					
		22.3		6.4					
10-Apr-11	19	23.0		5.9					
		23.1		6.7					
11-Apr-11	20	23.0	8.07	6.1	314				
		23.0	8.07	6.3	313				
12-Apr-11	21	23.1		7.2					
		23.1		6.7					
13-Apr-11	22	22.6	8.04	6.9					
		22.6	7.93	6.7					
14-Apr-11	23	22.5		6.8					
		22.5		7.1					
15-Apr-11	24	22.5	8.09	7.4					
		22.5	8.06	7.0					
16-Apr-11	25	22.6							
		22.6							
17-Apr-11	26	22.4							
		22.4							
18-Apr-11	27	22.8	7.83	6.9	301				
		23.0	8.03	7.3	303				
19-Apr-11	28	22.6	8.17	7.2	316	118	144	0.00	U
		22.6	8.10	7.2	312				
Mean		**22.7**	**7.95**	**6.7**	**309**	**120**	**146**	**0.16**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.17**	**7.4**	**316**	**122**	**148**	**0.32**	
Min#		**22.1**	**7.60**	**5.9**	**301**	**118**	**144**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	10	10	9	10	10
Weight- (mg)	0.26600	0.43300	0.27000	0.23000	0.25000	0.21445	0.27700	0.27000
Biomass- (mg)	0.26600	0.43300	0.27000	0.23000	0.25000	0.19300	0.27700	0.27000

28-Day Percent Survival 98.8%
Avg. Weight- (mg) 0.27631
Avg. Biomass- (mg) 0.27363
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 4.5 (GLC No. 8896) Concentration: 80%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.57	6.1	309	114	140	0.18	
		22.2	7.61	6.1	308				
23-Mar-11	1	22.6	7.80	6.2					
		22.6	7.79	6.2					
24-Mar-11	2	23.0		6.3					
		23.0		6.4					
25-Mar-11	3	22.9	7.88	6.5					
		22.9	7.89	6.3					
26-Mar-11	4	22.7							
		22.7							
27-Mar-11	5	22.3							
		22.3							
28-Mar-11	6	23.1	7.86	7.1	304				
		23.1	7.87	7.3	303				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.5	8.15	6.6					
		22.5	8.04	6.7					
31-Mar-11	9	22.3							
		22.3							
1-Apr-11	10	22.6	7.81	6.9					
		22.6	7.84	6.7					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.6	8.01	6.8	313				
		22.6	8.06	7.1	311				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	7.92	6.3					
		22.8	7.92	6.3					
7-Apr-11	16	22.6		6.6					
		22.6		7.1					
8-Apr-11	17	22.6	8.04	6.4					
		22.6	8.04	6.6					
9-Apr-11	18	22.3		6.3					
		22.3		5.9					
10-Apr-11	19	23.0		6.3					
		23.1		6.8					
11-Apr-11	20	23.1	7.67	6.4	310				
		23.1	7.90	6.0	312				
12-Apr-11	21	23.1		7.3					
		23.1		6.8					
13-Apr-11	22	22.6	7.91	7.0					
		22.6	7.93	6.2					
14-Apr-11	23	22.5		7.3					
		22.5		7.4					
15-Apr-11	24	22.5	7.95	7.4					
		22.5	7.91	7.7					
16-Apr-11	25	22.6							
		22.6							
17-Apr-11	26	22.4							
		22.4							
18-Apr-11	27	22.9	7.98	7.4	297				
		22.9	7.94	7.4	297				
19-Apr-11	28	22.7	8.09	7.1	318	118	156	0.00	U
		22.7	8.11	7.0	315				
Mean		**22.7**	**7.91**	**6.7**	**308**	**116**	**148**	**0.09**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.15**	**7.7**	**318**	**118**	**156**	**0.18**	
Min#		**22.2**	**7.57**	**5.9**	**297**	**114**	**140**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	6	9	10	10	9	9
Weight- (mg)	0.22100	0.19700	0.16834	0.19556	0.23900	0.24100	0.22889	0.21333
Biomass- (mg)	0.22100	0.19700	0.10100	0.17600	0.23900	0.24100	0.20600	0.19200

28-Day Percent Survival 91.3%
Avg. Weight- (mg) 0.21302
Avg. Biomass- (mg) 0.19663
Average Weight of *H.azteca* at day 0: 0.01850mg

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: CRM 4.5 (GLC No. 8896) Concentration: 100%

Test Dates: March 22-April 19, 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
22-Mar-11	0	22.2	7.61	6.2	304	114	148	0.07	J
		22.2	7.60	6.1	304				
23-Mar-11	1	22.6	7.77	5.9					
		22.6	7.76	6.0					
24-Mar-11	2	23.0		6.4					
		23.0		6.4					
25-Mar-11	3	22.8	7.89	6.6					
		22.8	7.90	6.6					
26-Mar-11	4	22.8							
		22.8							
27-Mar-11	5	22.3							
		22.3							
28-Mar-11	6	23.0	7.86	7.2	305				
		23.0	7.85	7.2	306				
29-Mar-11	7	22.7							
		22.7							
30-Mar-11	8	22.5	8.10	6.0					
		22.5	8.10	6.2					
31-Mar-11	9	22.3							
		22.3							
1-Apr-11	10	22.6	7.82	6.7					
		22.6	7.86	6.7					
2-Apr-11	11	22.9							
		22.9							
3-Apr-11	12	23.0							
		23.0							
4-Apr-11	13	22.6	8.07	6.7	309				
		22.6	8.02	6.6	309				
5-Apr-11	14	22.8							
		22.8							
6-Apr-11	15	22.8	7.95	6.9					
		22.8	7.98	7.0					
7-Apr-11	16	22.6		6.8					
		22.6		6.8					
8-Apr-11	17	22.6	8.00	6.7					
		22.6	8.05	6.3					
9-Apr-11	18	22.3		6.6					
		22.3		6.8					
10-Apr-11	19	23.1		6.9					
		23.1		6.0					
11-Apr-11	20	23.1	7.99	6.1	311				
		23.1	7.98	6.1	311				
12-Apr-11	21	23.1		7.1					
		23.1		7.3					
13-Apr-11	22	22.5	7.91	6.3					
		22.6	8.01	7.0					
14-Apr-11	23	22.5		7.3					
		22.5		6.8					
15-Apr-11	24	22.5	7.96	7.1					
		22.5	7.90	7.4					
16-Apr-11	25	22.6							
		22.6							
17-Apr-11	26	22.3							
		22.3							
18-Apr-11	27	22.7	7.86	7.2	296				
		22.8	7.86	7.3	296				
19-Apr-11	28	22.6	8.10	6.5	326	118	148	0.00	U
		22.6	8.05	6.7	319				
Mean		**22.7**	**7.92**	**6.7**	**308**	**116**	**148**	**0.04**	
Number		**58**	**28**	**40**	**12**	**2**	**2**	**2**	
Max #		**23.1**	**8.10**	**7.4**	**326**	**118**	**148**	**0.07**	
Min#		**22.2**	**7.60**	**5.9**	**296**	**114**	**148**	**0.00**	

Replicate	1	2	3	4	5	6	7	8
# Surviving	10	10	10	10	10	9	9	10
Weight- (mg)	0.20600	0.23100	0.21300	0.19800	0.15200	0.20333	0.20444	0.26300
Biomass- (mg)	0.20600	0.23100	0.21300	0.19800	0.15200	0.18300	0.18400	0.26300

28-Day Percent Survival 97.5%
Avg. Weight- (mg) 0.20885
Avg. Biomass- (mg) 0.20375
Average Weight of *H.azteca* at day 0: 0.01850mg

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 (TVA)
Project Number: 5069-03
Sample ID: CRM 7.0 water

Test Dates: March 24-May 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole
Test Species: *Chironomus dilutus*
All data recorded in log book

Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinty	Ammonia	Turbidity	GLEC #	AM/PM
3/21/11	Site CRM 7.0	22.6	8.1	8.17	296	152	118	0.00		8911	Pmstart
3/22/11	Site CRM 7.0	23.6	8.0	8.20	300					8911	AM
3/22/11	Site CRM 7.0	22.1	8.6							8911	PM
3/23/11	Site CRM 7.0	22.5	8.5							8911	PM
3/23/11	Site CRM 7.0	22.0	8.6							8911	PM
3/24/11	Site CRM 7.0	22.8	8.6							8911	AM
3/24/11	Site CRM 7.0	22.4	8.6							8911	PM
3/24/11	Site CRM 7.0	22.0	8.4							8911	AM
3/24/11	Site CRM 7.0	22.1	8.6							8911	PM
3/25/11	Site CRM 7.0	22.4	8.7	8.18	305					8911	AM
3/25/11	Site CRM 7.0	23.1	8.4							8911	PM
3/25/11	Site CRM 7.0	22.6	8.7	8.16	300					8911	AM
3/25/11	Site CRM 7.0	22.0	8.5							8911	PM
3/26/11	Site CRM 7.0	23.1	8.7							8911	AM
3/26/11	Site CRM 7.0	23.7	8.6							8911	PM
3/26/11	Site CRM 7.0	22.6	8.7							8911	AM
3/26/11	Site CRM 7.0	23.3	8.6							8911	PM
3/27/11	Site CRM 7.0	22.4	8.9	8.18	294					8911	AM
3/27/11	Site CRM 7.0	24.0	8.5							8911	PM
3/27/11	Site CRM 7.0	22.6	8.7	8.24	296					8911	AM
3/28/11	Site CRM 7.0	22.8	8.6							8911	AM
3/28/11	Site CRM 7.0	24.0	8.6							8911	PM
3/28/11	Site CRM 7.0	22.1	8.8							8911	AM
3/28/11	Site CRM 7.0	23.2	8.5							8911	PM
3/29/11	Site CRM 7.0	21.9	8.6	8.01						8911	AM
3/29/11	Site CRM 7.0	22.6	8.6							8911	PM
3/29/11	Site CRM 7.0	22.0	8.5	7.96						8911	AM
3/29/11	Site CRM 7.0	22.1	8.2							8913	PM
3/29/11	Site CRM 7.0	23.0	7.6	8.04	308	140	120	0.00		8913	start
3/29/11	Site CRM 7.0	23.0	8.2	8.01	297.3	136	120	0.00		8911	End

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 7.0 water

Test Dates: March 24-May 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole
Test Species: *Chironomus dilutus*
All data recorded in log book

Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinty	Ammonia	Turbidity	GLEC #	AM/PM
3/30/11	Site CRM 7.0	23.4	8.7	8.05	307					8913	AM
3/30/11	Site CRM 7.0	23.1	8.8							8913	PM
3/30/11	Site CRM 7.0	23.6	8.4	8.06	307					8913	AM
3/30/11	Site CRM 7.0	23.0	8.6							8913	PM
3/31/11	Site CRM 7.0	22.7	8.4	8.03	304					8913	AM
3/31/11	Site CRM 7.0	23.0	8.5							8913	PM
3/31/11	Site CRM 7.0	22.8	8.5	8.17	304					8913	AM
3/31/11	Site CRM 7.0	22.9	8.6							8913	PM
4/1/11	Site CRM 7.0	23.2	8.6	8.04	306					8913	AM
4/1/11	Site CRM 7.0	22.6	8.3							8913	PM
4/1/11	Site CRM 7.0	23.3	8.4	8.00	306					8913	AM
4/1/11	Site CRM 7.0	23.3	8.4	8.00	306	144	118	0.02		8913	end
4/1/11	Site CRM 7.0	23.0	8.5	8.12	305	144	124	0.02		8917	start
4/1/11	Site CRM 7.0	22.4	8.4							8917	PM
4/2/11	Site CRM 7.0	23.1	8.4	8.04	303					8917	AM
4/2/11	Site CRM 7.0	22.6	8.5							8917	PM
4/2/11	Site CRM 7.0	22.8	7.8	7.78	300					8917	AM
4/2/11	Site CRM 7.0	22.7	8.3							8917	PM
4/3/11	Site CRM 7.0	22.8	8.5	8.33	299					8917	AM
4/3/11	Site CRM 7.0	22.3	8.3							8917	PM
4/3/11	Site CRM 7.0	23.0	8.4	8.24	303					8917	AM
4/3/11	Site CRM 7.0	22.6	7.9							8917	PM
4/4/11	Site CRM 7.0	22.9	8.2	8.44	301					8917	AM
4/4/11	Site CRM 7.0	23.0	8.2	8.41	298.5					8917	AM
4/4/11	Site CRM 7.0	22.2	7.7							8917	PM
4/5/11	Site CRM 7.0	23.1	8.3	8.33	299.9					8917	AM
4/5/11	Site CRM 7.0	23.1	8.5							8919	PM
4/5/11	Site CRM 7.0	22.9	8.3	8.37	297.7	140	112	0.00		8917	AM/end
4/5/11	Site CRM 7.0	22.7	8.4							8917	PM
4/6/11	Site CRM 7.0	23.3	7.9	8.30	308	140	116	0.00	4.9-20.1	8919	AM/start
4/6/11	Site CRM 7.0	23.1	8.4							8919	PM

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 7.0 water

Test Dates: March 24-May 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole
Test Species: *Chironomus dilutus*
All data recorded in log book

Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinty	Ammonia	Turbidity	GLEC #	AM/PM
4/6/11	Site CRM 7.0	23.8	7.6	7.77	312					8917	AM
4/6/11	Site CRM 7.0	23.1	8.6							8919	PM
4/7/11	Site CRM 7.0	23.0	8.6	8.30	304					8919	AM
4/7/11	Site CRM 7.0	23.4	8.7							8919	PM
4/7/11	Site CRM 7.0	23.1	8.6	8.23	301					8919	AM
4/7/11	Site CRM 7.0	23.2	8.5							8919	PM
4/8/11	Site CRM 7.0	23.2	8.2	8.15	305					8919	AM
4/8/11	Site CRM 7.0	23.3								8922	PM
4/8/11	Site CRM 7.0	23.1	8.3							8922	PM
4/8/11	Site CRM 7.0	22.5	8.1	8.10	306					8919	AM
4/8/11	Site CRM 7.0	22.2	8.3							8919	PM
4/8/11	Site CRM 7.0	24.0	10.9	8.04	299	132	114	0.09	4.2-4.9	8922	start
4/9/11	Site CRM 7.0	22.9	6.7							8919	PM
4/9/11	Site CRM 7.0	22.9	8.1							8922	PM
4/9/11	Site CRM 7.0	23.1	8.3	8.26	297.5					8922	AM
4/9/11	Site CRM 7.0	23.0	8.4							8922	PM
4/9/11	Site CRM 7.0	22.8	8.3							8922	4th
4/9/11	Site CRM 7.0		8.6	8.33	302					8919	AM
4/10/11	Site CRM 7.0	22.9	8.3	8.26	299					8922	1st
4/10/11	Site CRM 7.0	23.6	8.0							8922	2nd
4/10/11	Site CRM 7.0	23.1	8.0								3rd
4/10/11	Site CRM 7.0	23.2	8.0							8922	4th
4/10/11	Site CRM 7.0	23.1	8.4	8.35	306					8919	1st
4/10/11	Site CRM 7.0	23.3	7.9								3rd
4/11/11	Site CRM 7.0	23.2	8.0	8.39	296.5	140	118	0.00		8922	1st/end
4/11/11	Site CRM 7.0	22.6	8.3							8922	2nd
4/11/11	Site CRM 7.0	23.0	8.2							8922	3rd
4/11/11	Site CRM 7.0	22.8	8.3							8928	4th
4/11/11	Site CRM 7.0	23.1	6.6	7.88	308	144	118	0.18		8919	1st/end
4/11/11	Site CRM 7.0	23.5	8.4	7.92	302	112	96	0.05	19.1-52.1	8928	2nd/start
4/12/11	Site CRM 7.0	23.2	8.3	8.31	266.7					8928	1st

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 7.0 water

Test Dates: March 24-May 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole
Test Species: *Chironomus dilutus*
All data recorded in log book

Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinty	Ammonia	Turbidity	GLEC #	AM/PM
4/12/11	Site CRM 7.0		7.3							8928	2nd
4/12/11	Site CRM 7.0	22.8	8.3							8928	PM
4/12/11	Site CRM 7.0	22.6	8.3	8.37	264.6					8928	1st
4/12/11	Site CRM 7.0	23.0	8.3							8928	PM
4/13/11	Site CRM 7.0	22.8	8.2	8.24	257.8					8928	AM
4/13/11	Site CRM 7.0	23.0								8928	2nd
4/13/11	Site CRM 7.0	23.1	8.4							8928	3rd
4/13/11	Site CRM 7.0	22.5	8.5	8.12	260					8928	AM
4/13/11	Site CRM 7.0	23.5	8.3							8928	3rd
4/14/11	Site CRM 7.0	22.5	8.1	7.69	238.1	120	102	0.00		8928	AM/end
4/14/11	Site CRM 7.0	23.0	8.3							8928	PM
4/14/11	Site CRM 7.0	22.3	8.0	7.62	240.1					8928	AM
4/14/11	Site CRM 7.0	23.1	10.2	7.96	268.6	136	110	0.00	5.0-10.5	8938	AM/start
4/14/11	Site CRM 7.0	23.1	8.5							8938	PM
4/15/11	Site CRM 7.0	23.0	8.5	7.74	261.4					8928	AM
4/15/11	Site CRM 7.0	22.7	8.0							8928	PM
4/15/11	Site CRM 7.0	23.1	8.5	7.92	294.3					8938	AM
4/15/11	Site CRM 7.0	22.5	8.0							8938	PM
4/16/11	Site CRM 7.0	22.5	8.5	8.47	292.3					8938	AM
4/16/11	Site CRM 7.0	22.6	8.2							8928	PM
4/16/11	Site CRM 7.0	22.2	8.4	8.43	293.5					8938	AM
4/16/11	Site CRM 7.0	22.1	7.4							8938	PM
4/17/11	Site CRM 7.0	22.4	8.2	8.35	291.5					8938	
4/17/11	Site CRM 7.0	22.5	8.4							8938	
4/17/11	Site CRM 7.0	22.5	8.2	8.37	293.7					8938	
4/17/11	Site CRM 7.0	22.0	8.5							8938	
4/18/11	Site CRM 7.0	22.3	8.5	8.31	293.5					8938	
4/18/11	Site CRM 7.0	22.3	8.9							8938	
4/18/11	Site CRM 7.0	22.3	8.1							8938	
4/18/11	Site CRM 7.0	22.9	8.4	8.39	293.2					8938	
4/18/11	Site CRM 7.0	22.3	8.3							8938	

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 7.0 water

Test Dates: March 24-May 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole
Test Species: *Chironomus dilutus*
All data recorded in log book

Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinty	Ammonia	Turbidity	GLEC #	AM/PM
4/19/11	Site CRM 7.0	22.6	8.1	8.33	292					8938	
4/19/11	Site CRM 7.0	23.8	8.5							8938	
4/19/11	Site CRM 7.0	23.1	8.3							8938	
4/19/11	Site CRM 7.0	22.3	8.3	8.04	313					8938	
4/20/11	Site CRM 7.0	22.6	8.4	8.41	291.3					8938	
	Site CRM 7.0	24.0	7.9							8938	
4/21/11	Site CRM 7.0	23.2	7.6	8.04						8938	
	Site CRM 7.0	24.0	8.2							8938	
4/22/11	Site CRM 7.0	23.7	8.4	8.01	304	120	110	0.04		8938	end
	Site CRM 7.0	22.0	7.8							8938	
4/23/11	Site CRM 7.0	23.0	7.9	8.37	284.4	132	110	0.07	8.7-10.1	8943	start
	Site CRM 7.0	22.3	8.3							8943	
4/24/11	Site CRM 7.0	22.8	8.2	8.39	285.7					8943	
	Site CRM 7.0	22.7	8.5							8943	
4/25/11	Site CRM 7.0	22.4	8.3	8.36	284.2					8943	
	Site CRM 7.0	23.2	8.4							8943	
4/26/11	Site CRM 7.0	22.6	8.4	8.26	285.7					8943	
	Site CRM 7.0	22.7	8.3							8943	
4/27/11	Site CRM 7.0	22.5	8.4	8.14	283.1	132	110	0.02		8943	end
	Site CRM 7.0	22.5	8.6	7.80	267.3	124	102	0.00	7.8-10.6	8958	start
4/28/11	Site CRM 7.0	22.8	8.3	8.15	269.6					8958	
	Site CRM 7.0	22.9	8.3							8958	
4/29/11	Site CRM 7.0	22.2	7.9	7.98	268					8958	
	Site CRM 7.0	23.0	8.2							8958	
4/30/11	Site CRM 7.0	22.6	8.3	8.22	266.4					8958	
	Site CRM 7.0	22.5	8.4							8958	
5/1/11	Site CRM 7.0	22.7	8.3	8.33	266.1					8958	
	Site CRM 7.0	22.8	8.8							8958	
5/2/11	Site CRM 7.0	22.6	8.2	8.34	268.4					8958	
	Site CRM 7.0	22.8	8.4							8958	
5/3/11	Site CRM 7.0	22.7	8.3	8.24	268.2					8958	

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: CRM 7.0 water

Test Dates: March 24-May 14, 2011
Test Type: Long Term Survival, Growth, and Emergence Whole
Test Species: *Chironomus dilutus*
All data recorded in log book

Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinty	Ammonia	Turbidity	GLEC #	AM/PM
	Site CRM 7.0	23.1	8.2							8958	
5/4/11	Site CRM 7.0	22.3	8.4	8.30	266.9					8958	
	Site CRM 7.0	22.9	8.2							8958	
5/5/11	Site CRM 7.0	23.1	8.4	8.15	270.4					8958	
	Site CRM 7.0	23.2	8.4							8958	
5/6/11	Site CRM 7.0	23.2	8.4	8.20	268					8958	
	Site CRM 7.0	23.0	8.4							8958	
5/7/11	Site CRM 7.0	22.5	8.3	8.32	264.9					8958	
	Site CRM 7.0	23.7	8.1							8958	
	Site CRM 7.0	22.7	8.5							8958	
5/8/11	Site CRM 7.0	22.5	8.5	8.27	265.3					8958	
	Site CRM 7.0	23.1	8.5							8958	
5/9/11	Site CRM 7.0	22.8	8.4	8.36	267.3	128	106	0.07		8958	end
	Site CRM 7.0	22.8	8.4							8958	
5/10/11	Site CRM 7.0	22.7	8.3	8.36	267.9					8958	
	Site CRM 7.0	22.9	8.4	7.97	266.9	128	102	0.04	7.5-9.2	8969	start
5/11/11	Site CRM 7.0	22.8	8.4	8.34	266.9					8969	
	Site CRM 7.0	23.1	8.2							8969	
5/12/11	Site CRM 7.0	22.8	8.1	8.33	270.5					8969	
	Site CRM 7.0	23.3	8.0							8969	
5/13/11	Site CRM 7.0	23.3	8.2	8.17	270.8					8969	
	Site CRM 7.0	22.7	8.1							8969	
5/14/11	Site CRM 7.0	22.8	8.1	8.19	282	128	104	0.00		8969	end
Mean		**22.8**	**8.3**	**8.17**	**288**	**134**	**112**	**0.0**			
Number		**175**	**175**	**84**	**81**	**20**	**20**	**20**			
Max #		**24.0**	**10.9**	**8.47**	**313**	**152**	**124**	**0.2**			
Min#		**21.9**	**6.6**	**7.62**	**238**	**112**	**96**	**0.0**			

Project Name: Tennessee Valley Authority (TVA)
Test Dates: March 24-May 14, 2011
Project Number: 5069-03
Test Type: Long Term Survival, Growth, and Emergence Whole Sediment
Sample ID: GLW Water (GLEC Lab Water)
Test Species: *Chironomus dilutus*
All data recorded in log book

Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinity	Ammonia	AM/PM
3/22/11	Dechlor	22.8	8.5	7.84	298.1	128	106	0	PM
3/23/11	Dechlor	22.8	8.5						PM
3/24/11	Dechlor	22.5	8.6						AM
3/24/11	Dechlor	22.6	8.8						PM
3/25/11	Dechlor	22.6	8.4	8.04	280				AM
3/25/11	Dechlor	22.9	8.4						PM
3/26/11	Dechlor	23.3	8.7						AM
3/26/11	Dechlor	23.6	8.5						PM
3/27/11	Dechlor	22.8	9.0	8.06	301				AM
3/27/11	Dechlor	22.6	8.7						PM
3/28/11	Dechlor	22.2	8.9						AM
3/28/11	Dechlor	23.1	8.6						PM
3/29/11	Dechlor	21.9	8.3	8.05					AM
3/29/11	Dechlor	22.2	8.4						PM
3/30/11	Dechlor	23.1	8.1	7.64	316				AM
3/30/11	Dechlor	23.0	8.1						PM
3/31/11	Dechlor	22.6	8.3	7.78	320			0	AM
3/31/11	Dechlor	22.8	7.9						PM
4/1/11	Dechlor	22.9	8.6	7.84	304	140	102		AM
4/1/11	Dechlor	22.4	7.5						PM
4/2/11	Dechlor	22.4	7.8	7.83	297				AM
4/2/11	Dechlor	22.2	7.3						PM
4/3/11	Dechlor	22.4	7.7	7.61	294				AM
4/3/11	Dechlor	23.5	8.1						PM
4/4/11	Dechlor	23.7	8.1	8.26	296.6				AM
4/4/11	Dechlor	23.1	8.2						PM
4/5/11	Dechlor	23.7	8.1	8.20	295.9			0	AM
4/5/11	Dechlor	23.9	6.5						PM
4/6/11	Dechlor	22.3	6.7	7.41	300				AM
4/6/11	Dechlor	24.0	7.5						PM

Project Name: Tennessee Valley Authority (TVA)					**Test Dates:** March 24-May 14, 2011					
Project Number: 5069-03					**Test Type:** Long Term Survival, Growth, and Emergence Whole Sediment					
Sample ID: GLW Water (GLEC Lab Water)					**Test Species**: *Chironomus dilutus*					
					All data recorded in log book					
Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinity	Ammonia	AM/PM	
4/7/11	Dechlor	22.7	8.1	8.19	300				AM	
4/7/11	Dechlor	23.6	8.0						PM	
4/8/11	Dechlor	22.0	6.1	7.40	326	136	102	0.26	AM	
4/8/11	Dechlor	23.8							PM	
4/8/11	Dechlor	23.8	8.0						PM	
4/9/11	Dechlor	23.8	8.2	8.06	293.8				AM	
4/9/11	Dechlor	23.0	8.1						PM	
4/9/11	Dechlor		7.8						PM	
4/9/11	Dechlor	22.9	7.0						4th	
4/10/11	Dechlor	23.7	8.1	8.23	297				1st	
4/10/11	Dechlor	23.8	7.9						2nd	
4/10/11	Dechlor	23.7	8.0						3rd	
4/10/11	Dechlor	23.4	8.1						4th	
4/11/11	Dechlor	23.2	5.6	7.79	297			0	1st	
4/11/11	Dechlor	23.6	8.1						2nd	
4/11/11	Dechlor	23.7	8.3						3rd	
4/11/11	Dechlor	23.3	8.3						4th	
4/12/11	Dechlor	23.3	8.2	8.38	300				1st	
4/12/11	Dechlor		8.4						2nd	
4/12/11	Dechlor	23.0	8.2						PM	
4/13/11	Dechlor	23.5	8.5	8.22	295.7				AM	
4/13/11	Dechlor	22.8	8.5						3rd	
4/14/11	Dechlor	22.7	8.2	7.74	269.6	136	104		AM	
4/14/11	Dechlor	23.4	8.3						PM	
4/15/11	Dechlor	22.7	8.3	7.81	299.9				AM	
4/15/11	Dechlor	23.1	8.1						PM	
4/16/11	Dechlor	22.8	8.5	8.48	297				AM	
4/16/11	Dechlor	22.6	7.8						PM	
4/17/11	Dechlor	23.3	8.1	8.37	294.2				AM	
		22.7	7.3						PM	
4/18/11	Dechlor	22.1	8.5	8.17	296.2			0	AM	
		22.9	8.1						PM	

Project Name: Tennessee Valley Authority (TVA)					**Test Dates:** March 24-May 14, 2011					
Project Number: 5069-03					**Test Type:** Long Term Survival, Growth, and Emergence Whole Sediment					
Sample ID: GLW Water (GLEC Lab Water)					**Test Species**: *Chironomus dilutus*					
					All data recorded in log book					
Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinity	Ammonia	AM/PM	
		23.0	8.1						AM	
4/19/11	Dechlor	22.5	8.3	8.31	294.8				PM	
		23.5	8.1						AM	
		23.2	8.1						PM	
4/20/11	Dechlor	22.8	8.2	8.38	295.5				AM	
		22.8	7.5						PM	
4/21/11	Dechlor	22.1	7.7	7.02					AM	
		23.7	8.0						PM	
4/22/11	Dechlor	23.6	8.1	7.84	299.9				AM	
		22.8	8.0						PM	
4/23/11	Dechlor	23.5	8.0	8.33	298.6				AM	
		23.4	7.5						PM	
4/24/11	Dechlor	22.8	8.0	8.33	300				AM	
		23.0	8.0						PM	
4/25/11	Dechlor	23.2	8.1	8.29	300				AM	
		23.5	8.0						PM	
4/26/11	Dechlor	22.8	8.1	8.30	293.1				AM	
		23.2	8.2						PM	
4/27/11	Dechlor	23.1	8.2	8.20	291.7			0	AM	
		23.5	8.1						PM	
4/28/11	Dechlor	22.8	8.3	8.39	292.4	140	104		AM	
		23.3	8.1						PM	
4/29/11	Dechlor	22.8	8.8	8.04	294				AM	
		23.3	7.6						PM	
4/30/11	Dechlor	22.9	8.3	8.16	294.5				AM	
		22.7	8.1						PM	
5/1/11	Dechlor	22.6	7.9	8.23	295.1				AM	
		22.9	8.4						PM	
5/2/11	Dechlor	23.0	8.1	8.31	294.5				AM	
		23.1	8.2						PM	
5/3/11	Dechlor	22.8	8.2	8.18	295.2				AM	
		23.0	8.3						PM	

Project Name: Tennessee Valley Authority (TVA)					**Test Dates:** March 24-May 14, 2011					
Project Number: 5069-03					**Test Type:** Long Term Survival, Growth, and Emergence Whole Sediment					
Sample ID: GLW Water (GLEC Lab Water)					**Test Species**: *Chironomus dilutus*					
					All data recorded in log book					
Date	Water Type	Temp	D.O	pH	Conductivit	Hardness	Alkalinity	Ammonia	AM/PM	
5/4/11	Dechlor	22.7	8.2	8.20	293.8				AM	
		23.0	8.3						PM	
5/5/11	Dechlor	22.7	8.4	8.19	294.6				AM	
		23.1	8.4						PM	
5/6/11	Dechlor	22.5	8.3	8.10	294				AM	
		23.1	8.1						PM	
5/7/11	Dechlor	22.8	8.4	8.32	293				AM	
		24.0	8.1						2nd	
		23.1	8.3						PM	
5/8/11	Dechlor	22.8	8.3	8.33	293.7				AM	
		22.8	8.4						PM	
5/9/11	Dechlor	23.1	8.4	8.37	294.5	136	104		AM	
		23.1	7.9						PM	
5/10/11	Dechlor	22.9	8.2	8.34	297.2				AM	
		23.2	7.9						PM	
5/11/11	Dechlor	23.3	8.0	8.31	296.1				AM	

Mean		**23.0**	**8.1**	**8.08**	**297**	**136**	**104**	**0**
Number		**108**	**109.0**	**47**	**45**	**6**	**6**	**7**
Max #		**24.0**	**9.0**	**8.48**	**326**	**140**	**106**	**0.26**
Min#		**21.9**	**5.6**	**7.02**	**270**	**128**	**102**	**0.00**

Appendix D
Chironomus dilutus
20-Day Statistical Data

- Survival
- Weight

TVA: 5069-03

Clinch River QC'd by: CB

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Silica Sand	Test Photoperiod: 16:8
Sample ID: GLW-Water only exposure	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: Dechlor DS 8/25/11
Overlying Water Batch ID (GLC Number): ~~8428~~ N/A
Number Daily Renewals: ~~4~~ DS 3
(1.5 ~~25~~ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ ——— renewal time/Initials ☑ 1930 CD renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			AV BHV
2	23.6	6.5	
3	23.6	6.8	
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: Dechlor
Overlying Water Batch ID (GLC Number): N/A / NW 8/19/11
Number Daily Renewals: 3
☑ 800 NW renewal time/Initials ☑ 1500 NW renewal time/Initials
☑ 1200 NS renewal time/Initials ☐ ——— renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2	22.3	4.1	7.62	306 9+1mi 12/12
3	23.0	4.7	7.53	302
4				
5	23.1	3.6	7.48	304
6	22.3		7.58	306 11/12
7				
8				
9	22.2	3.7	7.59	302 12/12
10				
11	22.2	3.9	7.55	302 13/13
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 day Ammonia 0.101 mg/L

* 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.

AV

TVA: 5069-03

Clinch River QC'd by C.B

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Boardman Sediment Lab Control (LCS)	Test Photoperiod: 16:8
Sample ID: LCS + GLW--Sediment Lab Control	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: Dechlor
Overlying Water Batch ID (GLC Number): ~~8928~~ N/A DS 8/23/11
Number Daily Renewals: ~~4~~ 3 DS 8/23/11
6:15 ~~X~~ DS renewal time/Initials ✓1200 NS renewal time/Initials
□ renewal time/Initials ✓1930 eb renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ✓ Feed 1.5 ml/replicate
Screens Cleaned: ✓ yes □ no □ n/a
✓1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.6	3.3	
3	23.5	3.0	
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: Dechlor
Overlying Water Batch ID (GLC Number): N/A
Number Daily Renewals: 3
✓ 800 renewal time/Initials ✓ 1500 renewal time/Initials
✓ 2110 NS renewal time/Initials □ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 026 NS ✓ Feed 1.5 ml/replicate
Screens Cleaned: □ yes ✓ no □ n/a
✓ 0900 RB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SpC	Observations 20 day
1	22.0	1.7	7.37	315	10/12
2					
3	23.0	1.7	7.41	324	10/12
4					
5	23.1	1.8	7.35	308	
6	22.1	2.4	7.47	315	9/12
7					
8					
9	21.7*	2.7	7.52	316	11/12
10					
11					
12					

HARD

NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

30 day Ammonia 0.0745 mg/L

SpC = specific conductivity

* taken out of water bath

TVA: 5069-03

Clinch River

QC'd by: eB

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: CRM 7.0 Site Water (CRW) with Boardman Sediment Lab Control (LCS)	Test Photoperiod: 16:8
Sample ID: LCS + CRW	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ 3 8/25/11
615 ~~2~~ 0 5 renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			nav BHV
2	23.3	9.2	
3	23.2	8.0	
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
~~8~~ 800 NW renewal time/Initials ~~1~~ 1500 NW renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 ~~AE~~ 8/22 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	20 day
1					NAV
2	23.2	2.0	7.45	277.1	10/12
3					NAV
4					↓
5					
6					↓
7	23.1	2.2	7.38	279.9	10/12
8					NAV
9					↓
10		1.9	7.46	280.8	10/12
11		1.8	7.47	286.7	12/12
12					~~NAV~~ → NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

20 Day Ammonia 0.063 mg/L J

SC specific conduc

* 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.

TVA: 5069-03

Clinch River QC'd by: CB

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8897	Test Photoperiod: 16:8
Sample ID: CRS + CRW (Clinch Reference + CRM 7.0)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8728
Number Daily Renewals: ~~X~~ DS 3
6:15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 ED renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV
2	23.3	5.4	AV
3	23.3	5.4	↓
4			
5			
6			AV
7			NAV
8			AV
9			
10			
11			
12			↓

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8978
Number Daily Renewals: 3
☒ 800 renewal time/Initials ☒ 1500 renewal time/Initials
☑ 1200 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations 20 day
1					NAV
2					↓
3	22.9	3.6	7.62	277.6	12/12
4	22.9	3.0	7.60	280.1	12/12
5		4.0	7.57	277.3	4/12
6					NAV
7					↓
8					
9					
10		3.5	7.48	276.5	11/12
11					NAV
12					↓

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.006 U mg/L

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC = Specific Cond.

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

QC'd by: CB

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8923
Number Daily Renewals: ~~4~~ 3
6:15 D.S renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 NS renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			AV BHV
2	23.6	4.8	nav
3	23.5	5.2	
4			
5			
6			AV
7			nav
8			AV
9			
10			nav
11			
12			AV

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8929
Number Daily Renewals: 3
☒ 800 renewal time/Initials ☒ 1500 renewal time/Initials
☑ 1400 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations	
				S. cond	Jelly
1					
2					
3	23.0	3.7	7.73	292.9	12/12
4					
5	23.0	3.8	7.72	291.4	
6					
7					
8	22.3	3.7	7.79	294.0	10+2 pupae 12
9					
10	22.6	4.2	7.88	293.2	12/12
11					
12	22.3	5.3	7.79	290.1	11+1 pupae 12

AV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 day Ammonia ~~0.237~~ mg/L
0.01 u
8/23/11

* 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.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 1.5

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Sample ID: CRM 1.5 Concentration: 20%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19

Date: 04/12/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8928

Number Daily Renewals: ~~1~~ ~~2~~ ~~3~~ 3

6:15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials

☐ ——— renewal time/Initials ☑ 1930 CD renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			N BHV
2	23.6	5.4	nav
3	23.6	5.4	↓
4			AV
5			nav
6			AV
7			↓
8			nav
9			↓
10			AV
11			nav
12			↓

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Test Day: Day 20

Date: 04/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8928

Number Daily Renewals: 3

☒ 800 renew renewal time/Initials ☒ 1500 renew renewal time/Initials

☑ 2100 NS renewal time/Initials ☐ ——— renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations S. cond
1				
2				
3	23.0	3.6	7.72	289.1
4				
5	23.0	3.5	7.76	292.3
6	22.2	5.0	7.96	296.2 10+2
7				
8				
9	22.5	3.9	7.84	287.5 10/12
10				
11	22.4	3.8	7.85	290.3 11/12
12	22.5	3.8	7.88	292.3 12/12

AV

20 day Ammonia (-0.012) 0.00 U mg/L

GLBC

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

QC'd by: CB

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ 3 ADS 6/23/11
6:15 ADS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ ____ renewal time/Initials ☑ 1930 renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			nav BHV
2	23.4	5.5	N
3	23.5	5.5	nav
4			AV
5			↓
6			↓
7			nav
8			↓
9			↓
10			AV
11			nav
12			AV

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
~~1~~ 800 NS renewal time/Initials ~~1~~ 1520 NS renewal time/Initials
~~1~~ 2100 NS renewal time/Initials ☐ ____ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

✓ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations s.cond 20 day
1	23.1	3.7	7.64	293.7 12/12
2				
3	23.1	3.7	7.75	288.7
4	23.2	4.3	7.80	290.9 12/12
5	23.1	3.6	7.71	285.6
6				
7				
8	~~23.3~~			
~~9~~ 10	23.3	3.7	7.79	291.5 12/12 Dep 10
~~10~~ 9				~~12/12~~ nur 8/26/11
11	23.3	4.4	7.82	288.2 10/12
12				

AV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible 20 day Ammonia 0.010 ~~ml~~ mg/L

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range. S. cond: specific conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: [illegible]

Sample ID: CRM 1.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Sample ID: CRM 1.5 Concentration: 60%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19

Date: 04/12/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8928

Number Daily Renewals: ~~1~~ 3

~~0815~~ DS renewal time/Initials ☑ 1200 NS renewal time/Initials

☐ ——— renewal time/Initials ☑ 1930 NS renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☑ yes ☐ no ☐ n/a

1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			nav BHV
2	23.4	5.8	
3	23.9	5.6	
4			
5			
6			
7			
8			
9			
10			AV
11			nav
12			

Test Day: Day 20

Date: 04/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8929

Number Daily Renewals: 3

~~0800~~ renewal time/Initials ~~☑~~ 1500 NS renewal time/Initials

~~0~~2100 NS renewal time/Initials ☐ ——— renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
				s.cond Zoolog
1				NAV
2				
3	23.1	3.9	7.71	285.5
4	23.2	4.0	7.78	288.1 11/12
5	23.1	4.0	7.73	288.9
6				
7	23.3	4.0	7.78	291.6 11/12
8				
9				
10	23.3	4.2	7.77	285.6 12/12
11	23.3	4.4	7.84	286.9 12/12
12				

AV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia (-0.028) 0 mg/L U

0.004

* 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.

S. Cond: Specific Conductance

TVA: 5069-03

Clinch River

QC'd by: [illegible]

Sample ID: CRM 1.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ 3 DS 4/15/11
6:15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ ——— renewal time/Initials ☑ 1930 renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.4	6.2	
3	23.4	6.3	
4			1 midge
5			NAV
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ 900 renewal time/Initials ☒ 1500 renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ ——— renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations S.cond 20day
1				
2				
3	23.1	4.3	7.73	281.1
4				
5	23.1	4.3	7.71	276.7
6				
7	22.6	4.9	7.78	285.0 12/12
8				
9	23.0	4.5	7.73	284.4 12/12
10				
11	23.0	4.7	7.74	279.5 12/12
12	23.1	3.7	7.70	281.2 11/12

NAV → AV → NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia (-0.041) 0 mg/L U

* 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.

S. cond: specific conductance

TVA: 5069-03

Clinch River

QC'd by: EB

Sample ID: CRM 1.5

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~X~~ DS 5/5/11
6.75 ~~X~~ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 CD renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ~~X~~ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1630 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.4	5.6	↓
3	23.5	5.6	↓
4			AV ↓
5			↓
6			NAV ↓
7			↓
8			↓
9			↓
10			↓
11			↓
12			↓ ↓

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ 8100 NS renewal time/Initials ☑ 1500 NS renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations	s. cond	20 day
1						NAV
2						
3	23.0	3.9	7.65		276.4	10/12
4						
5	23.1	3.6	7.61		280.4	10/12
6						
7	23.1	4.1	7.67		283.3	10/12
8						
9						
10						
11						
12	23.0	3.2	7.67		276.8	10/12

Skull Be 8 exp

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

20 Day Ammonia (-0.025) 0 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

S. Cond: Specific Conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 2.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~AS~~ ~~BS~~ 3
6:15 ~~X~~ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ ____ renewal time/Initials ☑ 1900 EB renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ~~X~~ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ 800 AW renewal time/Initials ☑ 1500 AW renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ ____ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			1 match BHV
2	23.4	5.3	nav
3	23.5	5.2	↓
4			↓
5			AV
6			nav
7			↓
8			AV
9			↓
10			nav
11			AV
12			nav

☑ 0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations s.cond
1				NAV
2	23.0	3.6	7.82	295.8 ↓
3	23.0	3.5	7.66	292.4 ↓
4				1 Male
5	23.1	3.4	7.64	290.0 NAV
6				↓
7	23.1	3.8	7.77	294.1
8				NAV
9				↓
10	23.1	4.5	7.68	294.5
11				NAV
12				↓

20 day

11 + 1 pupa 12

12/12

1 Male

9 Hpupa 1

10/12

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible 20 Day Ammonia (-0.022) 0 mg/L 4

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range. S. Cond: Specific Conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: RB

Sample ID: CRM 2.0

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ DS 3
6.15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.3	5.0	
3	23.5	5.2	
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ 8100 renewal time/Initials ☑ 1500 renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations S. cond		20 day
1					NAV	
2					↓	
3	23.0	3.6	7.67	288.7		12/12
4	23.2	3.2	7.80	294.4		12/12
5	23.6	3.5	7.69	289.9	NAV	
6					↓	
7						
8	23.1	3.1	7.82	299.9		12/12
9					NAV	
10					↓	
11						
12	22.8	~~5.2~~ 3.0	7.74	293.5		12/12

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia (-0.010) 0 mg/L U

S. cond: specific Conductance

* 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.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 2.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~NS~~ SPRD 3
6:15 ~~SD~~ S renewal time/Initials ✓1200 NS renewal time/Initials
— renewal time/Initials ✓1930 CD renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 0243 ✓ Feed 1.5 ml/replicate
Screens Cleaned: ✓ yes ☐ no ☐ n/a

✓1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.4	4.9	AV
3	23.4	5.0	NAV
4			
5			
6			
7			
8			
9			AV
10			NAV
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
✓~~800 NS~~ renewal time/Initials ✓1500 renewal time/Initials
✓2100 NS renewal time/Initials — renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 0255 NS ✓ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ✓ no ☐ n/a

✓ 0900 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations s.cond	20 day
1	22.8	3.2	7.77	295.3	12/12
2					NAV
3	23.0	3.5	7.68	285.7	12/12
4	23.0	3.6	7.85	296.1	11/12
5	23.0	3.5	7.66	287.6	12/12
6					NAV
7					
8					
9					
10					
11					
12					

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia (<0.003) 0 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

S. Cond: Specific conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: RB

Sample ID: CRM 2.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8925
Number Daily Renewals: ~~4~~ 3 DS 8/25/11
6:15 ~~X~~ DS renewal time/Initials ✓1200 NS renewal time/Initials
☐ ——— renewal time/Initials ✓1930 LD renewal time/Initials
Food: TFS (Tetrafin 4g/L)# D24 ✓ Feed 1.5 ml/replicate
Screens Cleaned: ✓ yes ☐ no ☐ n/a

✓1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.9	3.6	↓
3	23.9	4.6	AV
4			NAV
5			
6			
7			
8			
9			
10			
11			
12			AV

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
✓800 NW renewal time/Initials ✓1500 NW renewal time/Initials
✓2100 NS renewal time/Initials ——— renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ✓ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ✓ no ☐ n/a

✓0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations: s.cond	Observations: 20 day
1					NAV
2					↓
3	22.8	3.6	7.68	287.6	↓
4	22.8	4.3	7.84	283.7	11 p-pl 12/13
5	22.9	3.6	7.64	289.5	NAV
6					↓
7					↓
8					↓
9	22.9	3.6	7.75	285.9	12/13
10					NAV
11	22.7	3.6	7.82	290.8	12/13
12	23.0	3.6	7.80	289.8	12/13

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

20 Day Ammonia (0.009) mg/L U

* 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.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 2.0

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19	Test Day: Day 20
Date: 04/12/11	Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)	Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928	Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ 3	Number Daily Renewals: 3
6:15 ~~8~~ DS renewal time/Initials ✓1100 NS renewal time/Initials	~~8~~ 800 renewal time/Initials ~~8~~ 1500 renewal time/Initials
renewal time/Initials ✓1930 renewal time/Initials	~~8~~ 2100 NS renewal time/Initials renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ~~A~~ Feed 1.5 ml/replicate	Food: TFS (Tetrafin 4g/L)# 025 NS ✓ Feed 1.5 ml/replicate
Screens Cleaned: ✓ yes ☐ no ☐ n/a	Screens Cleaned: ☐ yes ✓ no ☐ n/a

✓ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BAV
2	23.2	4.5	
3	23.5	5.0	
4			
5			AV
6			NAV
7			AV
8			NAV
9			
10			
11			
12			

✓ 0900 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations: S.cond	Observations: Podding
1	22.6	2.7	7.66	284.6	12/12
2					NAV
3	22.8	3.8	7.67	279.1	NAV
4	22.6	3.7	7.76	288.9	11/12
5	22.8	3.7	7.68	281.7	12/12
6					NAV
7					
8					
9					
10					
11					
12	22.6	3.3	7.65	284.4	12/12

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia (-0.003) 0 mg/L U

* 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.

TVA: 5069-03

Clinch River

QC'd by: EB

Sample ID: CRM 2.0

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ 3 DS
DS ☒ 6:15 renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ ____ renewal time/Initials ☑ 1930 CD renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			AV BHV
2	23.1	5.2	NAV
3	23.1	5.0	
4			
5			
6			
7			AV
8			NAV
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☒ 800 NW renewal time/Initials ☒ 800 NW renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ ____ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations S. cond	20 day
1					NAV
2					NAV
3	22.6	4.2	7.73	279.9	8+1 pupae 12
4					NAV
5	22.6	3.9	7.65	275.8	11/12
6	22.7	3.7	7.69	278.1	10+1 pupae 12
7					NAV
8					
9					
10	22.7	3.9	7.70	276.0	12/12
11					NAV
12					

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia (<0.008) 0 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

S. cond: specific conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 3.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8925
Number Daily Renewals: ~~4~~ 3 ~~8/23/11~~ 83
6:15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ — renewal time/Initials ☑ 1920 CD renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			nav BHV
2	23.4	6.0	↓
3	23.3	6.1	AV
4			nav
5			↓
6			↓
7			AV
8			nav
9			↓
10			AV
11			↓
12			nav ↓

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
~~☑ 800 NW~~ renewal time/Initials ☑ 1500 NW renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ — renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC 20day
1	22.6	4.5	7.73	292.6 12/12
2				NW
3	22.7	4.3	7.97	295.7 12/12
4				NW
5				↓
6				↓
7				↓
8				↓
9	22.8	4.7	8.01	310 5+2p/12
10	22.7	4.3	7.87	294.7 8+1p/12
11				NW
12				↓

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.006 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC: Specific Conductance P= pupae

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 3.0

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 892.8
Number Daily Renewals: 4 3
6:15 DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ — renewal time/Initials ☑ 1930 ED renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.2	5.0	
3	23.3	4.0	
4			
5			
6			
7			
8			
9			
10			
11			
12			AV

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
~~0800 NW~~ renewal time/Initials ☒ 1500 NW renewal time/Initials
☑ 1100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	20 day
1	22.6	3.8	7.89	298.1	2+6/12
2					NAV
3					NAV
4					↓
5	22.7	3.2	7.75	298.8	5+6/12
6					NAV
7					↓
8					
9					↓
10	22.7	3.9	7.81	294.1	11/12
11					NAV
12	22.7	4.0	7.88	296.3	9+10/12

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

20 Day Ammonia 0.015 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC = Specific Conductance

P = Pupa

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: AB

Sample ID: CRM 3.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19	Test Day: Day 20
Date: 04/12/11	Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)	Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928	Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ 3	Number Daily Renewals: ~~4~~ 3 8/19/11
DS 6.15 ~~8:25/11~~ renewal time/Initials ✓1200 NS renewal time/Initials	~~✓800 NW~~ renewal time/Initials ✓1500 NW renewal time/Initials
☐ renewal time/Initials ✓1930 LD renewal time/Initials	✓2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ✓ Feed 1.5 ml/replicate	Food: TFS (Tetrafin 4g/L)# 025 NS ✓ Feed 1.5 ml/replicate
Screens Cleaned: ✓ yes ☐ no ☐ n/a	Screens Cleaned: ☐ yes ✓ no ☐ n/a

✓1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.2	4.9	↓
3	23.3	4.5	↓
4			↓
5			AV
6			NAV
7			↓
8			↓
9			↓
10			AV
11			AV
12			NAV ↓

✓0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations 20 day
1					NAV
2					↓
3					↓
4					↓
5	23.0	3.8	7.69	312	8+1 pupa
6					NAV
7					↓
8					↓
9	22.9	3.7	7.82	295.9	11/12
10	22.8	2.8	7.68	292.2	12/12
11	22.8	3.1	7.71	294.6	12/12
12					NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.009 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC: Specific Conductance p: pupa

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 3.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 4 DS 3
6:15 ☒ DS renewal time/Initials ☑ 1700 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 ED renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.3	5.0	
3	23.3	4.1	
4			
5			AV
6			NAV
7			
8			
9			AV
10			NAV
11			
12			AV

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
~~☒ 8:00 NS~~ renewal time/Initials ☒ 1500 NS renewal time/Initials
☑ 1100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations 20 day
1					NAV
2					
3	22.8	4.3	7.89	299.5	8+1 p/12
4	22.8	3.6	7.81	295.2	10/12
5					NAV
6					
7					
8					
9	22.7	4.1	7.90	281.4	11/12
10	22.8	2.7	7.73	296.9	12/12
11					NAV
12					

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.012 mg/L U
F: purple

* 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.

SC - Specific Conductance

TVA: 5069-03

Clinch River

QC'd by: EB

Sample ID: CRM 3.0

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8925
Number Daily Renewals: ~~4~~ BS 3
6:15 ☑ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 CD renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.5	4.5	
3	23.4	3.5	
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ 800 MW renewal time/Initials ☑ 1500 MW renewal time/Initials
☑ 1100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations 20 day
1	22.8	2.5	7.76	303	11/12
2					NAV
3					
4					
5					
6					
7					NW 1 pupa visible
8					
9					
10	22.9	2.2	7.74	302	10/12
11	22.7	3.7	7.84	298.2	12/12
12	22.8	4.1	7.80	293.7	12/12

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.023 U mg/L

SC: Specific conductance

* 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.

TVA: 5069-03

Clinch River

QC'd by: EB

Sample ID: CRM 3.0

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 4 ~~DS~~ 3
6:15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1900 renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 0241 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.4	3.8	
3	23.4	3.5	
4			
5			
6			1 hatch
7			NAV
8			
9			
10			AV
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☒ 800 NW renewal time/Initials ☑ 1500 NW renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations 20 day
1					NAV
2					↓
3					↓
4	22.6	2.4	7.71	301	12/12
5	22.8	2.5	7.73	296.1	11/12
6					NAV
7					↓
8	22.7	2.6	7.78	306	12/12
9					NAV
10					↓
11					↓
12	22.7	2.6	7.78	303	12/12

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.008 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC: Specific Conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: EB

Sample ID: CRM 4.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895

Sample ID: CRM 4.0 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19

Date: 04/12/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8928

Number Daily Renewals: 4 ~~3~~

6:15 ~~☒~~ DS renewal time/Initials ☑ 12:00 NS renewal time/Initials

☐ ——— renewal time/Initials ☑ 1930 NS renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 02.4 ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☑ yes ☐ no ☐ n/a

✓ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.4	4.8	↓
3	23.4	4.6	↓
4			AV
5			NAV
6			↓
7			AV
8			NAV
9			AV
10			NAV
11			AV
12			↓

Test Day: Day 20

Date: 04/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8928

Number Daily Renewals: 3

~~☒~~ 800 NS renewal time/Initials ☒ 1500 NS renewal time/Initials

✓ 1100 NS renewal time/Initials ☐ ——— renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

✓ 0900 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations 20 day
1					NAV
2	23.1	3.6	7.85	295.2	11+12/12
3	~~23.0~~ 8/22 NS				NAV ↓
4					
5	23.1	3.3	7.79	292.5	12/12
6					NAV ↓
7					
8	23.0	3.8	7.80	292.5	12/12
9					NAV ↓
10					
11	23.0	4.1	7.67	293.3	11+12/12
12					NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.041J mg/L

P = pupae

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC = Specific Conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

QC'd by: 013 Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895	Test Photoperiod: 16:8
Sample ID: CRM 4.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8925
Number Daily Renewals: 4 3 mins 8/19/11
6:15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 CB renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			nav BHV
2	23.4	5.0	↓
3	23.6	5.4	AV
4			↓
5			↓
6			nav
7			AV
8			↓
9			↓
10			↓
11			nav
12			AV

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8927
Number Daily Renewals: 3
☒ 800 NW renewal time/Initials ☒ 1500 NW renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations Today	
1						NAV
2	23.0	3.6	7.83	295.1	12/12	
3						NAV
4	23.1	4.5	7.91	293.9	12/12	
5						NAV
6				1 midge male		↓
7						
8	23.0	3.5	7.81	294.1	8+2p/12	
9						NAV
10	23.1	5.1	7.93	290.9	11+1p/12	
11					~~AV~~	1 pupae U.S.
12						NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.024 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC = Specific Conductance P = pupae

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: [illegible]

Sample ID: CRM 4.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895	Test Photoperiod: 16:8
Sample ID: CRM 4.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: ~~4~~ 3
6:15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.6	4.9	↓
3	23.6	4.6	↓
4			AV
5			NAV
6			AV
7			↓
8			NAV
9			↓
10			↓
11			AV
12			↓

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ 800 AM renewal time/Initials ☑ 1500 PM renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations	20 day
1					
2					
3	23.3	3.1	7.68	299.3	12/12
4	23.2	3.5	7.77	294.6	12/12
5					
6					
7					
8					
9				1 male midge	
10					
11	23.0	2.9	7.79	296.2	11/12
12	23.1	3.5	7.89	300	6 + 4 p/12

NAV ↓ NAV ↓

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.195 mg/L

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC= Specific Conductance P= pupae

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: CB

Sample ID: CRM 4.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895

Sample ID: CRM 4.0 Concentration: 60%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19

Date: 04/12/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8928

Number Daily Renewals: 3

6.15 ☒ DS renewal time/Initials ☑ 1200 NS renewal time/Initials

☐ renewal time/Initials ☑ 1930 ES renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			nav BAV
2	23.6	5.2	↓
3	23.5	4.7	↓
4			AV
5			nav
6			AV
7			nav
8			↓
9			↓
10			↓
11			AV
12			nav ↓

Test Day: Day 20

Date: 4/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8928

Number Daily Renewals: 3 per DS 9/7/11

☒ 800 mL renewal time/Initials ☒ 1500 NS renewal time/Initials

☑ 2100 NS renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC 20 day
1				NW
2				↓
3				↓
4				↓
5	23.0	4.4	7.87	292.3 11/12
6				↓
7				↓
8	23.1	3.5	7.82	294.3 12/12
9				↓
10	23.0	3.6	7.83	297.1 11/12
11	23.1	3.5	7.87	295.2 11/12
12				↓

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.041 mg/L J
P-purple

* 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.

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

QC'd by: PB Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895	Test Photoperiod: 16:8
Sample ID: CRM 4.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 4 DS 8/12/11
6.15 DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 DS renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 02.4 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			AV BHV
2	23.5	4.3	NAV
3	23.5	4.0	AV
4			NAV
5			AV
6			NAV
7			
8			
9			AV
10			NAV
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ renewal time/Initials ☑ renewal time/Initials
☑ 1100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC	Observations 20 day
1	23.6	2.4	7.45	291.5	12/12
2					NAV
3	23.3	2.9	7.61	294.7	12/12
4					NAV
5					
6					
7					
8					
9	23.2	3.6	7.71	293.6	12/12
10					NAV
11					
12	23.5	3.4	7.72	297.1	12/12

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

20 Day Ammonia 0.023 mg/L U

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

SC - Specific Conductance

*If DO declines by more than 1.0 mg/L since previous measurement, then measure daily.

TVA: 5069-03

Clinch River

QC'd by: EB

Sample ID: CRM 4.0
Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895	Test Photoperiod: 16:8
Sample ID: CRM 4.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 19
Date: 04/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 4 3 DS
0:15 DS renewal time/Initials ☑ 1200 NS renewal time/Initials
☐ renewal time/Initials ☑ 1930 NS renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 024 ☒ Feed 1.5 ml/replicate
Screens Cleaned: ☑ yes ☐ no ☐ n/a

☑ 1030 NS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2	23.9	4.7	
3	23.9	4.6	
4			
5			
6			
7			
8			
9			
10			
11			
12			

Test Day: Day 20
Date: 04/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8928
Number Daily Renewals: 3
☑ 800 NS renewal time/Initials ☑ 1500 NS renewal time/Initials
☑ 2100 NS renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 025 NS ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0900 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations SC
1	23.0	3.0	7.57	283.4 12/12
2				NAV
3				
4	23.1	3.8	7.73	290.0 12/12
5				NAV
6				
7				
8				
9				
10	23.2	3.4	7.74	295.3 9/12
11	23.3	3.7	7.73	293.2 12/12
12				NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

20 Day Ammonia 0.017 mg/L U

* 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.

Great Lakes Environmental Center

Longterm
~~10~~ 4/6/11
~~28~~-Day *Chironomous dilutus* **WEIGHT DATA**

Sample ID: 1VA day 10

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / muffle furnace

Project Name: 5069-03

Weigh Date: 4/5/11 and 4/6/11

Technician's Initials:

Test Date: 10 day Weigh

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/4/11 1500
Date/Time out: 4/5/11 1500

Dessicator
Date/Time in: 4/5/11 1500
Date/Time out: ~~4/8~~/11 1700
4/5/11
4/5/11

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/6/11 1400
Date/Time out: 4/6/11 1600

Dessicator
Date/Time in: 4/6/11 1630
Date/Time out: 4/6/11 1730

QC'd by:

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:	1		0.81372	0.79867	0.0505	80	0.18813	
day 10 weights	2							
GLEC Number:	3							
	4							
	5							
	6							
	7							
	8							
						AVERAGE:		

Project Name: Tennessee Valley Authority (TVA)
Project Number: 5069-03
Sample ID: GLW, LCS + GLW, LCS + CRW, CRS(8897)+CRW

Test Dates: March 24-May 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	2	12	10	9	1	11	0.83920	0.83140	0.70909
GLW	6	12	11	11	0	12	0.82864	0.81892	0.81000
GLW	9	12	12	12	0	12	0.83361	0.82503	0.71500
GLW	11	12	12	12	0	12	0.83702	0.82874	0.69000
LCS+GLW	1	12	12	12	0	12	0.81722	0.79866	1.54667
LCS+GLW	3	12	12	12	0	12	0.82549	0.80573	1.64667
LCS+GLW	6	12	9	9	0	12	0.82244	0.80946	1.08167
LCS+GLW	9	12	11	11	0	12	0.82198	0.80665	1.27750
LCS+CRW	2	12	10	10	0	12	0.83385	0.82174	1.00917
LCS+CRW	7	12	10	10	0	12	0.84495	0.83217	1.06500
LCS+CRW	10	12	10	10	0	12	0.83339	0.82291	0.87333
LCS+CRW	11	12	12	12	0	12	0.82632	0.81644	0.82333
CRS + CRW	3	12	12	12	0	12	0.82703	0.81779	0.77000
CRS + CRW	4	12	12	12	0	12	0.83965	0.82871	0.91167
CRS + CRW	5	12	9	9	0	12	0.83369	0.82242	0.93917
CRS + CRW	10	12	11	11	0	12	0.82799	0.81645	0.96167

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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: GLW-water only

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWB

Test Date: 3/25 - 4/13/11 (8/25/11)

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1430

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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: GLW water only	2	12	0.83920	0.83140	0.00780	9	0.86667	0.65000	1	0.70909
	6	12	0.82864	0.81892	0.00972	11	0.88363	0.81000	0	0.81000
	9	12	0.83361	0.82503	0.00858	12	0.71500	0.71500	0	0.71500
GLEC Number: GLW	11	12	0.83702	0.82874	0.00828	12	0.69000	0.69000	0	0.69000
	5									
	6									
	7									
	8									
						AVERAGE:	0.78883	0.71625		

* Biomass Weight (mg) - defined as the total Ash-Free-Dry-Weight of surviving organisms divided by the initial number of organisms

GLEC
Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: LCS + GLW

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle
Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWO

Test Date: 3/25 - 4/13/11
4
MWO 3/25/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1428

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
random sample weighed no order

QC'd by: NS

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: LCS+ GLW	1	12	0.81722	0.79866	0.01856	12	1.54667	1.54667	0	1.54667
	~~2~~ 3	12	0.82549	0.80573	0.01976	12	1.64667	1.64667	0	1.64667
GLEC Number:	~~3~~ 6	12	0.82244	0.80946	0.01298	9	1.44222	1.08167	0	1.08167
LCS+ GLW	~~4~~ 9	12	0.82198	0.80665	0.01533	11	1.393634	1.27750	0	1.27750
	~~5~~						recalc for NS 8/25/11			
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.50730	1.38813		

* 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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: LCS + CRW

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWS

Test Date: 3/25 - 4/13/11 (4 MWS 8/25/11)

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1518

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 2	12	0.83385	0.82174	0.01211	10	1.21100	1.00917
LCS+CRW	~~2~~ 7	12	0.84495	0.83217	0.01278	10	1.27800	1.06500
GLEC Number:	~~3~~ 10	12	0.83339	0.82291	0.01048	10	1.04800	0.87333
CRM 7.0	~~4~~ 11	12	0.82632	0.81644	0.00988	12	0.82333	0.82333
site water + LCS	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.09008	0.94271

* There were no pupae or midges observed on Day 20. Therefore, there was no change in biomass weight.

Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRS+CRW

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWW

Test Date: ~~3/25~~ 4/13/11 MWW 8/25/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1521

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-~~1200~~ 1330
samples weighed random

QC'd by: NS

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: CRS+CRW	~~1~~ 3	12	0.82703	0.81779	0.00924	12	0.77000	0.77000
	~~2~~ 4	12	0.83965	0.82871	0.01094	12	0.91167	0.91167
GLEC Number: 8897	~~3~~ 5	12	0.83369	0.82242	0.01127	9	1.25222	0.93917
	~~4~~ 10	12	0.82799	0.81645	0.01154	11	1.04909	0.96167
	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	0.99574	0.89563

* 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: CRM 1.5 (GLC No. 8889)

Test Dates: March 24-May 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 OrganismsSurviving	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		
CRM 1.5-10%	3	12	12	12	0	12	0.83519	0.82537	0.81833		
CRM 1.5-10%	8	12	12	10	2	10	0.82274	0.81038	1.23600		
CRM 1.5-10%	10	12	12	12	0	12	0.86144	0.84999	0.95417		
CRM 1.5-10%	12	12	12	11	1	11	0.85250	0.84046	1.09455		
CRM 1.5-20%	6	12	12	10	2	10	0.83928	0.82892	1.03600		
CRM 1.5-20%	9	12	10	10	0	12	0.82605	0.81626	0.81583		
CRM 1.5-20%	11	12	11	11	0	12	0.84539	0.83397	0.95167		
CRM 1.5-20%	12	12	12	12	0	12	0.83846	0.82733	0.92750		
CRM 1.5-40%	1	12	12	12	0	12	0.85724	0.84584	0.95000		
CRM 1.5-40%	4	12	12	12	0	12	0.83215	0.82190	0.85417		
CRM 1.5-40%	10	12	12	12	0	12	0.86274	0.85104	0.97500		
CRM 1.5-40%	11	12	10	10	0	12	0.83574	0.82561	0.84417		
CRM 1.5-60%	4	12	11	11	0	12	0.83619	0.82446	0.97750		
CRM 1.5-60%	7	12	11	11	0	12	0.86089	0.85159	0.77500		
CRM 1.5-60%	10	12	12	12	0	12	0.83064	0.81847	1.01417		
CRM 1.5-60%	11	12	12	12	0	12	0.82815	0.81819	0.83000		
CRM 1.5-80%	7	12	12	12	0	12	0.82788	0.81707	0.90083		
CRM 1.5-80%	9	12	10	10	0	12	0.84909	0.83648	1.05083		
CRM 1.5-80%	11	12	12	12	0	12	0.84272	0.83043	1.02417		
CRM 1.5-80%	12	12	11	11	0	12	0.85410	0.84091	1.09917		
CRM 1.5-100%	3	12	10	10	0	12	0.86234	0.84938	1.08000		
CRM 1.5-100%	5	12	12	12	0	12	0.84239	0.83108	0.94250		
CRM 1.5-100%	8	12	12	12	0	12	0.83967	0.82642	1.10417		
CRM 1.5-100%	12	12	11	10	1	11	0.83008	0.81623	1.25909		

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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 1.5

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MWB

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M / muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1425

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	3	12	0.83519	0.82537	0.00982	12	0.81833	0.81833	0	0.81833
CRM 1.5	8	12	0.82274	0.81038	0.01236	10	1.23600	1.03000	2	1.23600
GLEC Number:	10	12	0.86144	0.84999	0.01145	12	0.95417	0.95417	0	0.95417
8889	12	12	0.85250	0.84046	0.01204	11	1.09455	1.00333	1	1.09455
10%	5									
	6									
	7									
	8									
						AVERAGE:	1.02570	0.95146		

* 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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 1.5

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: Nuo

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1438

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 95

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 6	12	0.83928	0.82892	0.01036	10	1.03600	0.86333 NS 4/25	2	1.03600
CRM 1.5	~~2~~ 9	12	0.82605	0.81626	0.00979	10	0.97900	0.81583	0	0.81583
GLEC Number:	~~3~~ 11	12	0.84539	0.83397	0.01142	11	1.03818	0.95167	0	0.95167
8889	~~4~~ 12	12	0.83846	0.82733	0.01113	12	0.92750	0.92750	0	0.92750
20%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~							0.888958		
						AVERAGE:	0.99517	~~0.88458~~ ~~0.88875~~ NS 4/25		

* 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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 1.5

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: nwo

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/29/11 – 4/13/11

Type/Model of Drying Oven: Blue M | muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1439

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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: CRM 1.5	1	12	0.85724	0.84584	0.01140	12	0.95000	0.95000
	~~2~~ 4	12	0.83215	0.82190	0.01025	12	0.85417	0.85417
GLEC Number: 8889 40%	~~3~~ 9 10	12	0.86274	0.85104	0.01170	12	0.97500	0.97500
	~~4~~ 11	12	0.83574	0.82561	0.01013	10	1.01300	0.84417
	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	0.94804	~~0.90583~~ 0.90584

* There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass weight.

4/25

Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 1.5

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MWS

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M | Muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1442

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 4	12	0.83619	0.82446	0.01173	11	1.06636	0.97750
CRM 1.5	~~2~~ 7	12	0.86089	0.85159	0.00930	11	0.84546	0.77500
GLEC Number:	~~3~~ 10	12	0.83064	0.81847	0.01217	12	1.01417	1.01417
8889	~~4~~ 11	12	0.82815	0.81819	0.00996	12	0.83000	0.83000
60%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE: ~~0.93900~~ 0.93899		0.89917

MWS 4/25/11

* There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass weight.

Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 1.5

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M | Muffle

Scale: AE240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWO

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1445

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
samples weighed random

QC'd by: NS

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: CRM1.5	~~1~~ 7	12	0.82788	0.81707	0.01081	12	0.90083	0.90083
	~~2~~ 9	12	0.84909	0.83648	0.01261	10	1.26100	1.05083
GLEC Number:	~~3~~ 11	12	0.84272	0.83043	0.01229	12	1.02417	1.02417
8889	~~4~~ 12	12	0.85410	0.84091	0.01319	11	1.19909	1.09917
80%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.09627	1.01875

*There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass weight.

Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 1.5

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M | muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWS

Test Date: 3/24/11 – 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1523

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 3	12	0.86234	0.84938	0.01296	10	1.29600	1.08000	0	1.08000
CRM 1.5	~~2~~ 5	12	0.84239	0.83108	0.01131	12	0.94250	0.94250	0	0.94250
GLEC Number:	~~3~~ 8	12	0.83967	0.82642	0.01325	12	1.10417	1.10417	0	1.10417
8889	~~4~~ 12	12	0.83008	0.81623	0.01385	10	1.38500	1.15417	1	1.25909
100%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.18192	1.07021		

* 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: CRM 2.0 (GLC No. 8891)

Test Dates: March 24-May 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 OrganismsSurviving	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		
CRM 2.0-10%	2	12	12	11	1	11	0.84172	0.82959	1.10273		
CRM 2.0-10%	3	12	12	12	0	12	0.87048	0.85775	1.06083		
CRM 2.0-10%	7	12	10	9	1	11	0.84462	0.83242	1.10909		
CRM 2.0-10%	10	12	10	10	0	12	0.84389	0.83051	1.11500		
CRM 2.0-20%	3	12	12	12	0	12	0.84863	0.83700	0.96917		
CRM 2.0-20%	4	12	12	12	0	12	0.84128	0.82799	1.10750		
CRM 2.0-20%	8	12	12	12	0	12	0.82550	0.81379	0.97583		
CRM 2.0-20%	12	12	12	12	0	12	0.84232	0.83018	1.01167		
CRM 2.0-40%	1	12	12	12	0	12	0.85994	0.84405	1.32417		
CRM 2.0-40%	3	12	12	12	0	12	0.83965	0.82886	0.89917		
CRM 2.0-40%	4	12	11	11	0	12	0.85974	0.84525	1.20750		
CRM 2.0-40%	5	12	12	12	0	12	0.82819	0.81604	1.01250		
CRM 2.0-60%	4	12	10	9	1	11	0.82843	0.81830	0.92091		
CRM 2.0-60%	9	12	12	12	0	12	0.85384	0.83999	1.15417		
CRM 2.0-60%	11	12	12	12	0	12	0.83536	0.82349	0.98917		
CRM 2.0-60%	12	12	12	12	0	12	0.85660	0.84451	1.00750		
CRM 2.0-80%	1	12	12	12	0	12	0.85491	0.83846	1.37083		
CRM 2.0-80%	4	12	11	11	0	12	0.84619	0.83284	1.11250		
CRM 2.0-80%	5	12	12	12	0	12	0.84648	0.83439	1.00750		
CRM 2.0-80%	12	12	12	12	0	12	0.85810	0.84360	1.20833		
CRM 2.0-100%	3	12	9	8	1	11	0.83118	0.81927	1.08273		
CRM 2.0-100%	5	12	11	11	0	12	0.86394	0.85631	0.63583		
CRM 2.0-100%	6	12	11	10	1	11	0.83903	0.82643	1.14545		
CRM 2.0-100%	10	12	12	12	0	12	0.83820	0.82146	1.39500		

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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 2.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / muffle
Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MW

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1451

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130 1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 2	12	0.8~~89~~ 4172 MW 4/14	0.82959	0.01213	11	1.10273	1.010833	1	1.10273
CRM2.0	~~2~~ 3	12	0.87048	0.85775	0.01273	12	1.06083	1.06083	0	1.06083
GLEC Number:	~~3~~ 7	12	0.84462	0.83242	0.01220	9	1.35556	1.01667	1	1.10909
	~~4~~ 10	12	0.84389	0.83051	0.01338	10	1.33800	1.11500	0	1.11500
8891	~~5~~									
10%	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.21428	1.05083		

*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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 2.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MLW

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1454

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 3	12	0.84863	0.83700	0.01163	12	0.96917	0.96917
CRM2.0	~~2~~ 4	12	0.84128	0.82799	0.01329	12	1.10750	1.10750
GLEC Number:	~~3~~ 8	12	0.82550	0.81379	0.01171	12	0.97583	0.97583
8891	~~4~~ 12	12	0.84232	0.83018	0.01214	12	1.01167	1.01167
20%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.01604	1.01604

* There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass weight.

GLEC
Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 2.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M/ Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MW

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1455

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 0915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~	12	0.85994	0.84405	0.01589	12	1.32417	1.32417
CRM 2.0	~~2~~ 3	12	0.83965	0.82886	0.01079	12	0.89917	0.89917
GLEC Number:	~~3~~ 4	12	0.85974	0.84525	0.01449	11	1.31727	1.20750
8891	~~4~~ 5	12	0.82819	0.81604	0.01215	12	1.01250	1.01250
40%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.13828	~~1.11083~~ 1.11084

* There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass weight.

NS 4/25

Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 2.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M | Muffle

Scale: GE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MW

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1457

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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: CRM 2.0	~~1~~ 4	12	0.82843	0.81830	0.01013	9	1.12556	0.84446	1	0.92091
	~~2~~ 9	12	0.85384	0.83999	0.01385	12	1.15417	1.15417	0	1.15417
GLEC Number:	~~3~~ 11	12	0.83536	0.82349	0.01187	12	0.98917	0.98917	0	0.98917
8891	~~4~~ 12	12	0.85660	0.84451	0.01209	12	1.00750	1.00750	0	1.00750
60%	~~5~~						Rec'd in NS 8/25/11			
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.06920	0.99875		

*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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 2.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWS

Test Date: 3/24/11 – 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1509

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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: CRM 2.0	~~1~~	12	0.85491	0.83846	0.01645	12	1.37083	1.37083
	~~2~~ 4	12	0.84619	0.83284	0.01335	11	1.21364	1.11250
GLEC Number:	~~3~~ 5	12	0.84648	0.83439	0.01209	12	1.00750	1.00750
	~~4~~ 12	12	0.85810	0.84360	0.01450	12	1.20833	1.20833
8891	~~5~~							
80%	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.20008	1.17479

* There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass Weight.

Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 2.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MWS

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M | Muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 1300

Dessicator
Date/Time in: 4/14/11 1300
Date/Time out: 4/14/11 1511

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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: CRM 2.0 GLEC Number: 8891 100%	~~1~~ 3	12	0.83118	0.81927	0.01191	8	1.48875	0.99250	1	1.08273
	~~2~~ 5	12	0.86394	0.85631	0.00763	11	0.69363	0.63583	0	0.63583
	~~3~~ 6	12	0.83903	0.82643	0.01260	10	1.26000	1.05000	1	1.14545
	~~4~~ 10	12	0.83820	0.82146	0.01674	12	1.39500	1.39500	0	1.39500
	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
							AVERAGE: 1.20935	1.01833		

*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: CRM 3.0 (GLC No. 8893)

Test Dates: March 24-May 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 OrganismsSurviving	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		
CRM 3.0-10%	1	12	12	12	0	12	0.84063	0.83164	0.74917		
CRM 3.0-10%	3	12	12	12	0	12	0.83687	0.82698	0.82417		
CRM 3.0-10%	9	12	7	5	2	10	0.83913	0.82923	0.99000		
CRM 3.0-10%	10	12	9	8	1	11	0.82045	0.80827	1.10727		
CRM 3.0-20%	1	12	8	6	2	10	0.82909	0.82073	0.83600		
CRM 3.0-20%	5	12	7	5	2	10	0.81910	0.80756	1.15400		
CRM 3.0-20%	10	12	11	11	0	12	0.83663	0.82501	0.96833		
CRM 3.0-20%	12	12	10	9	1	11	0.83571	0.82194	1.25182		
CRM 3.0-40%	5	12	9	8	1	11	0.81892	0.80700	1.08364		
CRM 3.0-40%	9	12	11	11	0	12	0.83950	0.82636	1.09500		
CRM 3.0-40%	10	12	12	12	0	12	0.83365	0.82020	1.12083		
CRM 3.0-40%	11	12	12	12	0	12	0.82199	0.81300	0.74917		
CRM 3.0-60%	3	12	9	8	1	11	0.85233	0.84112	1.01909		
CRM 3.0-60%	4	12	10	10	0	12	0.83393	0.82230	0.96917		
CRM 3.0-60%	9	12	11	11	0	12	0.83949	0.82619	1.10833		
CRM 3.0-60%	10	12	12	12	0	12	0.83310	0.81742	1.30667		
CRM 3.0-80%	1	12	11	11	0	12	0.83192	0.82001	0.99250		
CRM 3.0-80%	10	12	10	10	0	12	0.85026	0.83636	1.15833		
CRM 3.0-80%	11	12	12	12	0	12	0.84117	0.83130	0.82250		
CRM 3.0-80%	12	12	12	12	0	12	0.83697	0.82212	1.23750		
CRM 3.0-100%	4	12	12	12	0	12	0.83484	0.82017	1.22250		
CRM 3.0-100%	5	12	11	11	0	12	0.86142	0.84684	1.21500		
CRM 3.0-100%	8	12	12	12	0	12	0.83674	0.82182	1.24333		
CRM 3.0-100%	12	12	12	12	0	12	0.84860	0.83076	1.48667		

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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 3.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M | Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MW

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1300
Date/Time out: 4/14/11 ~~1545~~ 1505 MW 8/10/11

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1555

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	1	12	0.84063	0.83164	0.00899	12	0.74917	0.74917	0	0.74917
CRM 3.0	~~2~~ 3	12	0.83687	0.82698	0.00989	12	0.82417	0.82417	0	0.82417
GLEC Number:	~~3~~ 9	12	0.83913	0.82923	0.00990	5	1.98000	~~1.98000~~ 0.8250 NS 4/26	2	0.99000
8893	~~4~~ 10	12	0.82045	0.80827	0.01218	8	1.52250	1.01500	1	1.10727
10%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.26896	~~0.85333~~ 0.85334 NS 4/26		

*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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: ORM 3.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M | Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWS

Test Date: 3/24/11 – 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1607

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	1 (mwc 4/28/11) 1	12	0.82909	0.82073	0.00836	6	1.39333	0.69667	2	0.83600
ORM 3.0	2 5	12	0.81910	0.80756	0.01154	5	2.30800	0.96167	2	1.15400
GLEC Number:	3 10	12	0.83663	0.82501	0.01162	11	1.05636	0.96833	0	0.96833
8843	4 12	12	0.83571	0.82194	0.01377	9	1.53000	1.14750	1	1.25182
20%	5									
	6									
	7									
	8									
						AVERAGE:	1.57192	0.94354		

* 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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 3.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MW

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1609

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 5	12	0.81892	0.80700	0.01192	8	1.49000	0.99333	1	1.08364
CRM 3.0	~~2~~ 9	12	0.83950	0.82636	0.01314	11	1.19455	1.09500	0	1.09500
GLEC Number:	~~3~~ 10	12	0.83365	0.82020	0.01345	12	1.12083	1.12083	0	1.12083
	~~4~~ 11	12	0.82199	0.81300	0.00899	12	~~0.7496~~ 0.74917 4/15/11	0.74917	0	0.74917
8893 40%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.13864	0.98958		

* 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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 3.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MWS

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1010

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 3	12	0.85233	0.84112	0.01121	8	1.40125	0.93417	1	1.01909
CRM 3.0	~~2~~ 4	12	0.83393	0.82230	0.01163	10	1.16300	0.96917	0	0.96917
GLEC Number:	~~3~~ 9	12	0.83949	0.82619	0.01330	11	1.20909	1.10833	0	1.10833
8893	~~4~~ 10	12	0.83310	0.81742	0.01568	12	1.30667	1.30667	0	1.30667
60%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.27000	~~1.07958~~ 1.07959	(15)	

* 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

9/06

GLEC
Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 3.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWS

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1613

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	1	12	0.83192	0.82001	0.01191	11	1.08273	0.99250
CRM 3.0	~~2~~ 10	12	0.85026	0.83636	0.01390	10	1.39000	1.15833
GLEC Number:	~~3~~ 11	12	0.84117	0.83130	0.00987	12	0.82250	~~0.82506~~ 0.82250
8893	~~4~~ 12	12	0.83697	0.82212	0.01485	12	1.23750	1.23750
80%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.13318	1.05271

* There were no pupae or midges observed on Day 20 Therefore, there was no change in Biomass Weight. 4/15/11

GLEC
Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 3.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWS

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1615

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 4	12	0.83484	0.82017	0.01467	12	1.22250	1.22250
CRM 3.0	~~2~~ 5	12	0.86142	0.84684	0.01458	11	1.32545	1.21500
GLEC Number:	~~3~~ 8	12	0.83674	0.82182	0.01492	12	1.24333	1.24333
8893	~~4~~ 10	12	0.84860	0.83076	0.01784	12	1.48667	1.48667
100%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.31949	1.29188

*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: CRM 4.0 (GLC No. 8895)

Test Dates: March 24-May 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 OrganismsSurviving	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		
CRM 4.0-10%	2	12	12	11	1	11	0.83417	0.82335	0.98364		
CRM 4.0-10%	5	12	12	12	0	12	0.85379	0.84102	1.06417		
CRM 4.0-10%	8	12	12	12	0	12	0.84124	0.82739	1.15417		
CRM 4.0-10%	11	12	12	11	1	11	0.83469	0.82292	1.07000		
CRM 4.0-20%	2	12	12	12	0	12	0.86491	0.85063	1.19000		
CRM 4.0-20%	4	12	12	12	0	12	0.85523	0.84336	0.98917		
CRM 4.0-20%	8	12	10	8	2	10	0.85669	0.84629	1.04000		
CRM 4.0-20%	10	12	12	11	1	11	0.85060	0.83631	1.29909		
CRM 4.0-40%	3	12	12	12	0	12	0.88184	0.86785	1.16583		
CRM 4.0-40%	4	12	12	12	0	12	0.85223	0.83990	1.02750		
CRM 4.0-40%	11	12	11	11	0	12	0.83634	0.82798	0.69667		
CRM 4.0-40%	12	12	10	6	4	8	0.82133	0.81461	0.84000		
CRM 4.0-60%	5	12	11	11	0	12	0.84057	0.82873	0.98667		
CRM 4.0-60%	8	12	12	12	0	12	0.85069	0.83812	1.04750		
CRM 4.0-60%	10	12	12	11	1	11	0.86379	0.84976	1.27545		
CRM 4.0-60%	11	12	11	11	0	12	0.84216	0.82800	1.18000		
CRM 4.0-80%	1	12	12	12	0	12	0.85033	0.83557	1.23000		
CRM 4.0-80%	3	12	12	12	0	12	0.85421	0.83255	1.80500		
CRM 4.0-80%	9	12	12	12	0	12	0.83637	0.82460	0.98083		
CRM 4.0-80%	12	12	12	12	0	12	0.84157	0.82817	1.11667		
CRM 4.0-100%	1	12	12	12	0	12	0.83731	0.82663	0.89000		
CRM 4.0-100%	4	12	12	12	0	12	0.85224	0.84052	0.97667		
CRM 4.0-100%	10	12	9	9	0	12	0.83747	0.82565	0.98500		
CRM 4.0-100%	11	12	12	12	0	12	0.83788	0.82535	1.04417		

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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 4.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: GE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials: MWO

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1020

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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: CRM 4.0 GLEC Number: 8895 10%	~~1~~ 2	12	0.83417	0.82335	0.01082	11	0.98364	0.90167	1	0.98364
	~~2~~ 5	12	0.85379	0.84102	0.01277	12	1.06417	1.06417	0	1.06417
	~~3~~ 8	12	0.84124	0.82739	0.01385	12	1.15417	1.15417	0	1.15417
	~~4~~ 11	12	0.83469	0.82292	0.01177	11	1.07000	0.98083	1	1.07000
	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	~~1.26848~~ 8/25/11 1.06799	~~0.85355~~ 8/25/11 1.02521		

* 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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 4.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MWB

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1622

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 2	12	0.86491	0.85063	0.01428	12	1.19000	1.19000	0	1.19000
CRM 4.0	~~2~~ 4	12	0.85523	0.84336	0.01187	12	0.98917	0.98917	0	0.98917
GLEC Number:	~~3~~ 8	12	0.85669	0.84629	0.01040	8	1.30000	0.86667	2	1.04000
8895	~~4~~ 10	12	0.85060	0.83631	0.01429	11	1.29909	1.19083	1	1.29909
20%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	~~1.19450~~ NS 1.19457 4/26	1.05917		

*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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 4.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MW

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 4/13/11

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1624

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	~~1~~ 3	12	0.88184	0.86785	0.01399	12	1.16583	1.16583	0	1.16583
CRM 4.0	~~2~~ 4	12	0.85223	0.83990	0.01233	12	1.02750	1.02750	0	1.02750
GLEC Number:	~~3~~ 11	12	0.83634	0.82798	0.00836	11	0.76000	0.69667	0	0.69667
8895	~~4~~ 12	12	0.82133	0.81461	0.00672	6	1.12000	0.56000	4	0.84000
40%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.01833	0.86250		

* 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

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 4.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MW

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1626

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130 - 1330
samples weighed random

QC'd by: NS

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:	~~1~~ 5	12	0.84057	0.82873	0.01184	11	1.07636	0.98667	0	0.98667
CRM 4.0	~~2~~ 8	12	0.85069	0.83812	0.01257	12	1.04750	1.04750	0	1.04750
GLEC Number:	~~3~~ 10	12	0.86379	0.84976	0.01403	11	1.27545	1.16917	1	1.27546
8895	~~4~~ 11	12	0.84216	0.82800	0.01416	11	1.28727	1.18000	0	1.18000
60%	~~5~~									
	~~6~~									
	~~7~~									
	~~8~~									
						AVERAGE:	1.17165	~~1.09583~~ 1.09584		

*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

NS 4/26

GLEC
Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 4.0

Test Species: *C. dilutus*

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE 240

Project Name: Tennessee Valley Authority (TVA)

Weigh Date: 4/14/11 and 4/15/11

Technician's Initials:

Test Date: 3/24/11 - 4/13/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1628

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in:
Date/Time out:

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330
Samples weighed random

QC'd by: NS

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:	1	12	0.85033	0.83557	0.01476	12	1.23000	1.23000
CRM4.0	~~2~~ 3	12	0.85421	0.83255	0.02166	12	1.80500	1.80500
GLEC Number:	~~3~~ 9	12	0.83637	0.82460	0.01177	12	0.98083	0.98083
8895	~~4~~ 12	12	0.84157	0.82817	0.01340	12	~~1.16667~~ 1.11667 AW 8/25/11	~~1.16667~~ 1.11667 AW 8/25/11
80%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~						1.28313	1.28313
						AVERAGE:	~~1.28313~~ ~~1.29563~~ NS 4/25	~~1.28313~~ ~~1.29563~~ NS 4/25

* There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass Weight.

Great Lakes Environmental Center

20-Day *Chironomous dilutus* WEIGHT DATA

Sample ID: CRM 4.0

Project Name: Tennessee Valley Authority (TVA)

Technician's Initials: MWV

Test Species: *C. dilutus*

Weigh Date: 4/14/11 and 4/15/11

Test Date: 3/24/11 - 4/13/11

Type/Model of Drying Oven: Blue M / Muffle

Scale: AE240

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/13/11 1500
Date/Time out: 4/14/11 1505

Dessicator
Date/Time in: 4/14/11 1505
Date/Time out: 4/14/11 1030

Oven Temperature: 550 °C
Drying Duration (Hours): 2 hrs
Date/Time in: 4/15/11 715
Date/Time out: 4/15/11 915

Dessicator
Date/Time in: 4/15/11 1030
Date/Time out: 4/15/11 1130-1330 Samples weighed random

QC'd by: NS

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:	1	12	0.83731	0.82663	0.01068	12	0.89000	0.89000
CRM 4.0	~~2~~ 4	12	0.85224	0.84052	0.01172	12	0.97667	0.97667
GLEC Number:	~~3~~ 10	12	0.83747	0.82565	0.01182	9	1.31333	0.98500
8895	~~4~~ 11	12	0.83788	0.82535	0.01253	12	1.04417	1.04417
100%	~~5~~							
	~~6~~							
	~~7~~							
	~~8~~							
						AVERAGE:	1.05604	0.97396

*There were no pupae or midges observed on Day 20. Therefore, there was no change in Biomass weight.

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	3/24/2011	Test ID:	5069-con20	Sample ID:	-LCS
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4
GLW	0.8333	0.9167	1.0000	1.0000
LCS+GLW	1.0000	1.0000	0.7500	0.9167
LCS + CRW	0.8333	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	0.9375	1.0227	1.3200	1.1503	1.4260	10.072	4			
LCS+GLW	0.9167	1.0000	1.2943	1.0472	1.4260	13.821	4	*		
LCS + CRW	0.8750	0.9545	1.2192	1.1503	1.4260	11.306	4	0.665	1.943	0.2194

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.92431	0.818	-0.1568	-0.4335
F-Test indicates equal variances (p = 0.68)	1.68395	47.4672		
The control means are not significantly different (p = 0.82)	0.23121	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	0.15191	0.16414	0.01127	0.0255	0.53081	1, 6

ToxCalc v5.0.32

Reviewed by:

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	3/24/2011	Test ID:	5069-con20	Sample ID:	-LCS
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4
GLW	0.8667	0.8836	0.7150	0.6900
LCS+GLW	1.5467	1.6467	1.4422	1.3936
LCS + CRW	1.2110	1.2780	1.0480	0.8233

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.7888	0.5233	0.7888	0.6900	0.8836	12.733	4			
LCS+GLW	1.5073	1.0000	1.5073	1.3936	1.6467	7.479	4	*		
*LCS + CRW	1.0901	0.7232	1.0901	0.8233	1.2780	18.565	4	3.602	1.943	0.2251

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95554	0.818	-0.5258	-0.3031
F-Test indicates equal variances (p = 0.36)	3.22236	47.4672		
The control means are significantly different (p = 7.68E-05)	9.51693	2.44691		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences Treatments vs LCS+GLW	0.22507	0.14932	0.34814	0.02683	0.01134	1, 6

ToxCalc v5.0.32

Reviewed by: Nuk

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	3/24/2011	Test ID:	5069-con20	Sample ID:	-LCS
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4
GLW	0.7091	0.8100	0.7150	0.6900
LCS+GLW	1.5467	1.6467	1.0817	1.2775
LCS + CRW	1.0092	1.0650	0.8733	0.8233

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.7310	0.5266	0.7310	0.6900	0.8100	7.349	4			
LCS+GLW	1.3881	1.0000	1.3881	1.0817	1.6467	18.514	4	*		
*LCS + CRW	0.9427	0.6791	0.9427	0.8233	1.0650	12.007	4	3.172	1.943	0.2728

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.96618	0.818	-0.2692	-0.5354
F-Test indicates equal variances (p = 0.21)	5.155	47.4672		
The control means are significantly different (p = 2.44E-03)	5.00561	2.44691		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences Treatments vs LCS+GLW	0.27284	0.19655	0.39679	0.03943	0.01926	1, 6

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	3/24/2011	Test ID:	5069-1.520	Sample ID:	-CRM 1.5
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	0.8333	0.8333	0.8333	1.0000
CRS + CRW	1.0000	1.0000	0.7500	0.9167
10	1.0000	1.0000	1.0000	1.0000
20	1.0000	0.8333	0.9167	1.0000
40	1.0000	1.0000	1.0000	0.8333
60	0.9167	0.9167	1.0000	1.0000
80	1.0000	0.8333	1.0000	0.9167
100	0.8333	1.0000	1.0000	0.9167

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + CRW	0.8750	0.9545	1.2192	1.1503	1.4260	11.306	4				
CRS + CRW	0.9167	1.0000	1.2943	1.0472	1.4260	13.821	4	*		0.9583	1.0000
10	1.0000	1.0909	1.4260	1.4260	1.4260	0.000	4	22.00	10.00	0.9583	1.0000
20	0.9375	1.0227	1.3200	1.1503	1.4260	10.072	4	18.50	10.00	0.9514	0.9928
40	0.9583	1.0455	1.3570	1.1503	1.4260	10.158	4	20.00	10.00	0.9514	0.9928
60	0.9583	1.0455	1.3520	1.2780	1.4260	6.320	4	19.00	10.00	0.9514	0.9928
80	0.9375	1.0227	1.3200	1.1503	1.4260	10.072	4	18.50	10.00	0.9375	0.9783
100	0.9375	1.0227	1.3200	1.1503	1.4260	10.072	4	18.50	10.00	0.9375	0.9783

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.89118	0.924	-0.7581	-0.462
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.53)	0.66492	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs CRS + CRW				

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: AS

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	3/24/2011	Test ID:	5069-1.520	Sample ID:	-CRM 1.5
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	1.2110	1.2780	1.0480	0.8233
CRS + CRW	0.7700	0.9117	1.2522	1.0491
10	0.8183	1.2360	0.9542	1.0945
20	1.0360	0.9790	1.0382	0.9275
40	0.9500	0.8542	0.9750	1.0130
60	1.0664	0.8455	1.0142	0.8300
80	0.9008	1.2610	1.0242	1.1991
100	1.2960	0.9425	1.1042	1.3850

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	1.0901	1.0947	1.0901	0.8233	1.2780	18.565	4					
CRS + CRW	0.9957	1.0000	0.9957	0.7700	1.2522	20.635	4	*			1.0260	1.0000
10	1.0258	1.0301	1.0258	0.8183	1.2360	17.537	4	-0.279	2.451	0.2640	1.0260	1.0000
20	0.9952	0.9994	0.9952	0.9275	1.0382	5.304	4	0.005	2.451	0.2640	1.0260	1.0000
40	0.9480	0.9521	0.9480	0.8542	1.0130	7.144	4	0.443	2.451	0.2640	1.0260	1.0000
60	0.9390	0.9430	0.9390	0.8300	1.0664	12.676	4	0.527	2.451	0.2640	1.0260	1.0000
80	1.0963	1.1010	1.0963	0.9008	1.2610	14.998	4	-0.933	2.451	0.2640	1.0260	1.0000
100	1.1819	1.1870	1.1819	0.9425	1.3850	16.753	4	-1.729	2.451	0.2640	1.0260	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.96848	0.924	-0.0278	-0.6637
Bartlett's Test indicates equal variances (p = 0.32)	6.98175	16.8119		
The control means are not significantly different (p = 0.54)	0.65423	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.264	0.26513	0.02984	0.02319	0.30581	6, 21
Treatments vs CRS + CRW										

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: AB

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	3/24/2011	Test ID:	5069-1.520	Sample ID:	-CRM 1.5
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch River Sediment

Conc-%	1	2	3	4
LCS + CRW	1.0092	1.0650	0.8733	0.8233
CRS + CRW	0.7700	0.9117	0.9392	0.9617
10	0.8183	1.2360	0.9542	1.0945
20	1.0360	0.8158	0.9517	0.9275
40	0.9500	0.8542	0.9750	0.8442
60	0.9775	0.7750	1.0142	0.8300
80	0.9008	1.0508	1.0242	1.0992
100	1.0800	0.9425	1.1042	1.2591

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.9427	1.0526	0.9427	0.8233	1.0650	12.007	4					
CRS + CRW	0.8956	1.0000	0.8956	0.7700	0.9617	9.626	4	*			0.9678	1.0000
10	1.0258	1.1453	1.0258	0.8183	1.2360	17.537	4	-1.627	2.451	0.1961	0.9678	1.0000
20	0.9327	1.0415	0.9327	0.8158	1.0360	9.731	4	-0.464	2.451	0.1961	0.9678	1.0000
40	0.9058	1.0114	0.9058	0.8442	0.9750	7.325	4	-0.128	2.451	0.1961	0.9678	1.0000
60	0.8992	1.0040	0.8992	0.7750	1.0142	12.771	4	-0.044	2.451	0.1961	0.9678	1.0000
80	1.0188	1.1375	1.0188	0.9008	1.0992	8.296	4	-1.539	2.451	0.1961	0.9678	1.0000
100	1.0964	1.2242	1.0964	0.9425	1.2591	11.831	4	-2.510	2.451	0.1961	0.9678	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98142	0.924	-0.0967	-0.3554
Bartlett's Test indicates equal variances (p = 0.71)	3.73568	16.8119		
The control means are not significantly different (p = 0.53)	0.66184	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.19611	0.21896	0.02499	0.0128	0.11891	6, 21
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	3/24/2011	Test ID:	5069-2.020	Sample ID:	-CRM 2.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	0.8333	0.8333	0.8333	1.0000
CRS + CRW	1.0000	1.0000	0.7500	0.9167
10	1.0000	1.0000	0.8333	0.8333
20	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	0.9167	1.0000
60	0.8333	1.0000	1.0000	1.0000
80	1.0000	0.9167	1.0000	1.0000
100	0.7500	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 + CRW	0.8750	0.9545	1.2192	1.1503	1.4260	11.306	4				
CRS + CRW	0.9167	1.0000	1.2943	1.0472	1.4260	13.821	4	*		0.9583	1.0000
10	0.9167	1.0000	1.2881	1.1503	1.4260	12.357	4	18.00	10.00	0.9583	1.0000
20	1.0000	1.0909	1.4260	1.4260	1.4260	0.000	4	22.00	10.00	0.9583	1.0000
40	0.9792	1.0682	1.3890	1.2780	1.4260	5.328	4	20.50	10.00	0.9583	1.0000
60	0.9583	1.0455	1.3570	1.1503	1.4260	10.158	4	20.00	10.00	0.9583	1.0000
80	0.9792	1.0682	1.3890	1.2780	1.4260	5.328	4	20.50	10.00	0.9583	1.0000
100	0.8958	0.9773	1.2573	1.0472	1.4260	12.445	4	16.50	10.00	0.8958	0.9348

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.91119	0.924	-0.728	-0.1425
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.53)	0.66492	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs CRS + CRW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	95.333			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

ToxCalc v5.0.32

Reviewed by: RB

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	3/24/2011	Test ID:	5069-2.020	Sample ID:	-CRM 2.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	1.2110	1.2780	1.0480	0.8233
CRS + CRW	0.7700	0.9117	1.2522	1.0491
10	1.1027	1.0608	1.3556	1.3380
20	0.9692	1.1075	0.9758	1.0117
40	1.3242	0.8992	1.3173	1.0125
60	1.1256	1.1542	0.9892	1.0075
80	1.3708	1.2136	1.0075	1.2083
100	1.4888	0.6936	1.2600	1.3950

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	1.0901	1.0947	1.0901	0.8233	1.2780	18.565	4					
CRS + CRW	0.9957	1.0000	0.9957	0.7700	1.2522	20.635	4	*			1.1204	1.0000
10	1.2143	1.2195	1.2143	1.0608	1.3556	12.692	4	-1.566	2.451	0.3421	1.1204	1.0000
20	1.0160	1.0204	1.0160	0.9692	1.1075	6.276	4	-0.145	2.451	0.3421	1.1204	1.0000
40	1.1383	1.1431	1.1383	0.8992	1.3242	18.950	4	-1.021	2.451	0.3421	1.1204	1.0000
60	1.0691	1.0737	1.0691	0.9892	1.1542	7.752	4	-0.526	2.451	0.3421	1.1204	1.0000
80	1.2001	1.2052	1.2001	1.0075	1.3708	12.406	4	-1.464	2.451	0.3421	1.1204	1.0000
100	1.2093	1.2145	1.2093	0.6936	1.4888	29.470	4	-1.531	2.451	0.3421	1.1204	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95692	0.924	-0.8261	1.40094
Bartlett's Test indicates equal variances (p = 0.14)	9.61507	16.8119		
The control means are not significantly different (p = 0.54)	0.65423	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.34208	0.34355	0.03497	0.03895	0.51461	6, 21
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	3/24/2011	Test ID:	5069-2.020	Sample ID:	-CRM 2.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch River Sediment

Conc-%	1	2	3	4
LCS + CRW	1.0092	1.0650	0.8733	0.8233
CRS + CRW	0.7700	0.9117	0.9392	0.9617
10	1.1027	1.0608	1.1091	1.1150
20	0.9692	1.1075	0.9758	1.0117
40	1.3242	0.8992	1.2075	1.0125
60	0.9209	1.1542	0.9892	1.0075
80	1.3708	1.1125	1.0075	1.2083
100	1.0827	0.6358	1.1455	1.3950

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.9427	1.0526	0.9427	0.8233	1.0650	12.007	4					
CRS + CRW	0.8956	1.0000	0.8956	0.7700	0.9617	9.626	4	*			1.0538	1.0000
10	1.0969	1.2247	1.0969	1.0608	1.1150	2.240	4	-1.766	2.451	0.2795	1.0538	1.0000
20	1.0160	1.1344	1.0160	0.9692	1.1075	6.276	4	-1.056	2.451	0.2795	1.0538	1.0000
40	1.1108	1.2403	1.1108	0.8992	1.3242	17.185	4	-1.888	2.451	0.2795	1.0538	1.0000
60	1.0179	1.1366	1.0179	0.9209	1.1542	9.644	4	-1.073	2.451	0.2795	1.0538	1.0000
80	1.1748	1.3117	1.1748	1.0075	1.3708	13.134	4	-2.449	2.451	0.2795	1.0538	1.0000
100	1.0648	1.1888	1.0648	0.6358	1.3950	29.693	4	-1.484	2.451	0.2795	1.0538	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95092	0.924	-0.5411	2.6472
Bartlett's Test indicates equal variances (p = 0.01)	16.6768	16.8119		
The control means are not significantly different (p = 0.53)	0.66184	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.27946	0.31203	0.03173	0.02599	0.33492	6, 21
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	3/24/2011	Test ID:	5069-3.020	Sample ID:	-CRM 3.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	0.8333	0.8333	0.8333	1.0000
CRS + CRW	1.0000	1.0000	0.7500	0.9167
10	1.0000	1.0000	0.5833	0.7500
20	0.6667	0.5833	0.9167	0.8333
40	0.7500	0.9167	1.0000	1.0000
60	0.7500	0.8333	0.9167	1.0000
80	0.9167	0.8333	1.0000	1.0000
100	1.0000	0.9167	1.0000	1.0000

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.8750	0.9545	1.2192	1.1503	1.4260	11.306	4					
CRS + CRW	0.9167	1.0000	1.2943	1.0472	1.4260	13.821	4	*			0.9167	1.0000
10	0.8333	0.9091	1.1921	0.8691	1.4260	23.463	4	0.804	2.451	0.3118	0.8819	0.9621
20	0.7500	0.8182	1.0632	0.8691	1.2780	17.429	4	1.817	2.451	0.3118	0.8819	0.9621
40	0.9167	1.0000	1.2943	1.0472	1.4260	13.821	4	0.000	2.451	0.3118	0.8819	0.9621
60	0.8750	0.9545	1.2253	1.0472	1.4260	13.359	4	0.542	2.451	0.3118	0.8819	0.9621
80	0.9375	1.0227	1.3200	1.1503	1.4260	10.072	4	-0.203	2.451	0.3118	0.8819	0.9621
100	0.9792	1.0682	1.3890	1.2780	1.4260	5.328	4	-0.744	2.451	0.3118	0.8819	0.9621

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95215	0.924	-0.3178	-0.9098
Bartlett's Test indicates equal variances (p = 0.62)	4.39248	16.8119		
The control means are not significantly different (p = 0.53)	0.66492	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.23347	0.25227	0.04459	0.03236	0.26902	6, 21
Treatments vs CRS + CRW										

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: AB

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	3/24/2011	Test ID:	5069-3.020	Sample ID:	-CRM 3.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	1.2110	1.2780	1.0480	0.8233
CRS + CRW	0.7700	0.9117	1.2522	1.0491
10	0.7492	0.8242	1.9800	1.5225
20	1.3933	2.3080	1.0564	1.5300
40	1.4900	1.1945	1.1208	0.7492
60	1.4013	1.1630	1.2091	1.3067
80	1.0827	1.3900	0.8225	1.2375
100	1.2225	1.3255	1.2433	1.4867

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	1.0901	1.0947	1.0901	0.8233	1.2780	18.565	4					
CRS + CRW	0.9957	1.0000	0.9957	0.7700	1.2522	20.635	4	*			1.2789	1.0000
10	1.2690	1.2744	1.2690	0.7492	1.9800	46.352	4	-1.112	2.451	0.6025	1.2789	1.0000
20	1.5719	1.5786	1.5719	1.0564	2.3080	33.688	4	-2.344	2.451	0.6025	1.2789	1.0000
40	1.1386	1.1435	1.1386	0.7492	1.4900	26.763	4	-0.581	2.451	0.6025	1.2153	0.9503
60	1.2700	1.2754	1.2700	1.1630	1.4013	8.349	4	-1.116	2.451	0.6025	1.2153	0.9503
80	1.1332	1.1380	1.1332	0.8225	1.3900	21.369	4	-0.559	2.451	0.6025	1.2153	0.9503
100	1.3195	1.3251	1.3195	1.2225	1.4867	9.093	4	-1.317	2.451	0.6025	1.2153	0.9503

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94739	0.924	0.53292	0.81385
Bartlett's Test indicates equal variances (p = 0.05)	12.3659	16.8119		
The control means are not significantly different (p = 0.54)	0.65423	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.60252	0.6051	0.13302	0.12082	0.39446	6, 21
Treatments vs CRS + CRW										

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: AB

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	3/24/2011	Test ID:	5069-3.020	Sample ID:	-CRM 3.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch River Sediment

Conc-%	1	2	3	4
LCS + CRW	1.0092	1.0650	0.8733	0.8233
CRS + CRW	0.7700	0.9117	0.9392	0.9617
10	0.7492	0.8242	0.9900	1.1073
20	0.8360	1.1540	0.9683	1.2518
40	1.0836	1.0950	1.1208	0.7492
60	1.0191	0.9692	1.1083	1.3067
80	0.9925	1.1583	0.8225	1.2375
100	1.2225	1.2150	1.2433	1.4867

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.9427	1.0526	0.9427	0.8233	1.0650	12.007	4					
CRS + CRW	0.8956	1.0000	0.8956	0.7700	0.9617	9.626	4	*			1.0462	1.0000
10	0.9177	1.0246	0.9177	0.7492	1.1073	17.607	4	-0.199	2.451	0.2720	1.0462	1.0000
20	1.0525	1.1752	1.0525	0.8360	1.2518	17.688	4	-1.414	2.451	0.2720	1.0462	1.0000
40	1.0122	1.1301	1.0122	0.7492	1.1208	17.390	4	-1.050	2.451	0.2720	1.0462	1.0000
60	1.1008	1.2291	1.1008	0.9692	1.3067	13.519	4	-1.850	2.451	0.2720	1.0462	1.0000
80	1.0527	1.1754	1.0527	0.8225	1.2375	17.509	4	-1.416	2.451	0.2720	1.0462	1.0000
100	1.2919	1.4424	1.2919	1.2150	1.4867	10.095	4	-3.572	2.451	0.2720	1.0462	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94932	0.924	-0.1554	-0.9464
Bartlett's Test indicates equal variances (p = 0.93)	1.91597	16.8119		
The control means are not significantly different (p = 0.53)	0.66184	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.27197	0.30366	0.06919	0.02462	0.03621	6, 21
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Chironomus dilutus Partial Life-cycle Test-20-Day Survival

Start Date:	3/24/2011	Test ID:	5069-4.020	Sample ID:	-CRM 4.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	0.8333	0.8333	0.8333	1.0000
CRS + CRW	1.0000	1.0000	0.7500	0.9167
10	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	0.8333	1.0000
40	1.0000	1.0000	0.9167	0.8333
60	0.9167	1.0000	1.0000	0.9167
80	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	0.7500	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 + CRW	0.8750	0.9545	1.2192	1.1503	1.4260	11.306	4				
CRS + CRW	0.9167	1.0000	1.2943	1.0472	1.4260	13.821	4	*		0.9618	1.0000
10	1.0000	1.0909	1.4260	1.4260	1.4260	0.000	4	22.00	10.00	0.9618	1.0000
20	0.9583	1.0455	1.3570	1.1503	1.4260	10.158	4	20.00	10.00	0.9618	1.0000
40	0.9375	1.0227	1.3200	1.1503	1.4260	10.072	4	18.50	10.00	0.9618	1.0000
60	0.9583	1.0455	1.3520	1.2780	1.4260	6.320	4	19.00	10.00	0.9618	1.0000
80	1.0000	1.0909	1.4260	1.4260	1.4260	0.000	4	22.00	10.00	0.9618	1.0000
100	0.9375	1.0227	1.3313	1.0472	1.4260	14.225	4	19.50	10.00	0.9375	0.9747

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.86327	0.924	-1.1904	0.88433
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.53)	0.66492	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs CRS + CRW				

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: RB

Chironomus dilutus Partial Life-cycle Test-20-Day Growth (AFDW)

Start Date:	3/24/2011	Test ID:	5069-4.020	Sample ID:	-CRM 4.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4
LCS + CRW	1.2110	1.2780	1.0480	0.8233
CRS + CRW	0.7700	0.9117	1.2522	1.0491
10	0.9836	1.0642	1.1542	1.0700
20	1.1900	0.9892	1.3000	1.2991
40	1.1658	1.0275	0.7600	1.1200
60	1.0764	1.0475	1.2755	1.2873
80	1.2300	1.8050	0.9808	1.1167
100	0.8900	0.9767	1.3133	1.0442

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	1.0901	1.0947	1.0901	0.8233	1.2780	18.565	4					
CRS + CRW	0.9957	1.0000	0.9957	0.7700	1.2522	20.635	4	*			1.1219	1.0000
10	1.0680	1.0726	1.0680	0.9836	1.1542	6.523	4	-0.509	2.451	0.3482	1.1219	1.0000
20	1.1946	1.1997	1.1946	0.9892	1.3000	12.251	4	-1.400	2.451	0.3482	1.1219	1.0000
40	1.0183	1.0227	1.0183	0.7600	1.1658	17.831	4	-0.159	2.451	0.3482	1.1219	1.0000
60	1.1716	1.1767	1.1716	1.0475	1.2873	10.867	4	-1.238	2.451	0.3482	1.1219	1.0000
80	1.2831	1.2886	1.2831	0.9808	1.8050	28.253	4	-2.023	2.451	0.3482	1.1219	1.0000
100	1.0560	1.0606	1.0560	0.8900	1.3133	17.307	4	-0.424	2.451	0.3482	1.0560	0.9413

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95663	0.924	0.76903	1.4838
Bartlett's Test indicates equal variances (p = 0.27)	7.53096	16.8119		
The control means are not significantly different (p = 0.54)	0.65423	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.34823	0.34972	0.04468	0.04036	0.39126	6, 21
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	97.035			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Chironomus dilutus Partial Life-cycle Test-20-Day Biomass (AFDW)

Start Date:	3/24/2011	Test ID:	5069-4.020	Sample ID:	-CRM 4.0
End Date:	4/13/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch River Sediment

Conc-%	1	2	3	4
LCS + CRW	1.0092	1.0650	0.8733	0.8233
CRS + CRW	0.7700	0.9117	0.9392	0.9617
10	0.9836	1.0642	1.1542	1.0700
20	1.1900	0.9892	1.0400	1.2991
40	1.1658	1.0275	0.6967	0.8400
60	0.9867	1.0475	1.2755	1.1800
80	1.2300	1.8050	0.9808	1.1167
100	0.8900	0.9767	0.9850	1.0442

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.9427	1.0526	0.9427	0.8233	1.0650	12.007	4					
CRS + CRW	0.8956	1.0000	0.8956	0.7700	0.9617	9.626	4	*			1.0719	1.0000
10	1.0680	1.1925	1.0680	0.9836	1.1542	6.523	4	-1.353	2.451	0.3123	1.0719	1.0000
20	1.1296	1.2612	1.1296	0.9892	1.2991	12.533	4	-1.836	2.451	0.3123	1.0719	1.0000
40	0.9325	1.0412	0.9325	0.6967	1.1658	22.120	4	-0.289	2.451	0.3123	1.0719	1.0000
60	1.1224	1.2532	1.1224	0.9867	1.2755	11.591	4	-1.780	2.451	0.3123	1.0719	1.0000
80	1.2831	1.4327	1.2831	0.9808	1.8050	28.253	4	-3.041	2.451	0.3123	1.0719	1.0000
100	0.9740	1.0875	0.9740	0.8900	1.0442	6.523	4	-0.615	2.451	0.3123	0.9740	0.9087

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.93187	0.924	1.09396	3.32506
Bartlett's Test indicates equal variances (p = 0.04)	13.1097	16.8119		
The control means are not significantly different (p = 0.53)	0.66184	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.31233	0.34873	0.07282	0.03247	0.07896	6, 21
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	90.947			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Appendix E
Chironomus dilutus
Emergence Statistical Data

- Partial Life Cycle Survival
- Emergence

TVA: 5069-03

Clinch River

QC'd by: NW

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Silica Sand	Test Photoperiod: 16:8
Sample ID: GLW-Water only exposure	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47
Date: 5/10/11
Overlying Water: Dechlor
Overlying Water Batch ID (GLC Number): NW 8/25/11 ~~8469~~ NA
Number Daily Renewals: 2
☑ DS 6:30 renewal time/Initials ☑ DR 1900 renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1400 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2			
3			
4			
5			NAV BHV
6			
7			
8	23.0	4.3	~~23.0~~ NAV
9			
10	23.0	3.6	~~23.0~~ NAV
11			
12			

Test Day: Day 48
Date: 5/11/11
Overlying Water: Dechlor
Overlying Water Batch ID (GLC Number): NA
Number Daily Renewals: 1
☑ 640 EB renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials
Food: TFS (Tetrafin 4g/L)# — ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1200 NW chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations	+ @ takedown
1	22.9	4.0	7.57	NAV	0.
2					
3					
4					
5	22.9	4.5	7.60	NAV	0
6					
7					
8				NAV	0
9					
10				NAV	0
11					
12					

NW 5< 303 301 NH4= 0.00 EB

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

	Start	End	mL Used	
Hardness	6.1	9.5	3.4	136
Alkalinity	26.5	41.7	5.2	104

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: GLW Water

Concentration: —

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Silica Sand

Sample ID: GLW-Water only exposure

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/11/11

Technician Initials
DS 8/29/11
MLL 8/29/11
MW 8/29/11
AD 8/29/11
MW signed for Tech in field: NS 8/29/11
EB 8/29/11
SRW 8/29/11
DR 8/29/11
EB 9/1/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/21/11 M	4/18/11 M	4/22/11 M	4/16/11 M	4/18/11 M	4/22/11 M	4/14/11 M	~~4/19/11 F~~ 4/20/11 M
2	4/21/11 M	4/19/11 M	4/28/11 M	4/19/11 M	4/19/11 M	4/20/11 M	4/15/11 M	~~4/19/11 F~~ 4/20/11 M
3	4/22/11 M	4/24/11 M	4/29/11 M	4/21/11 M	4/20/11 M	5/2/11 F	4/16/11 F	4/20/11 M
4	4/22/11 F	4/25/11 M	4/29/11 unknown sex	4/24/11 F	4/24/11 M	5/3/11 F	4/18/11 F	4/26/11 F
5	~~4/27/11 M~~	4/25/11 M	4/30/11 F	4/25/11 F	4/25/11 F	5/5/11 M	4/19/11 F	4/27/11 M
6	4/27/11 F	4/26/11 M	5/2/11 M	4/26/11 F	4/25/11 F	/	/	4/23/11 M
7	4/29/11 M	4/27/11 F	5/2/11 M	4/26/11 M	4/25/11 F	4/23/11 M	/	4/28/11 F
8	4/29/11 M	4/23/11 M	5/4/11 M	4/28/11 M	4/26/11 M	/	/	4/29/11 Unknown
9	4/23/11 M	4/28/11 M	5/5/11 F	4/29/11 M	4/26/11 M	/	/	4/30/11 F
10	5/2/11 F	4/28/11 Unknown	5/7/11 F	4/26/11 F	5/01/11 M	/	/	5/2/11 F
11	/	5/2/11 F	5/7/11 F	/	5/01/11 F	/	/	5/6/11 F
12	O-TT	5/5/11 M	5/8/11 F	O-TT	5/3/11 F	O-TT	O-TT	5/6/11 F
Hatched Totals	10-E^{S}	12^{S}	12^{S}	10E^{S}	12^{S}	6ES	5ES	12^{S}
20 Day Survival	Rep 2 - 9+1 mage /12	Rep ~~8~~ 6 - 11 /12	Rep 9 - 12 /12	Rep 11 - 12 /12				

Hatch Date 4/23/11 not in consecutive order MW for SRW 9/7/11

M — MALE

F — Female

* MW for NS 8/25/11

~~9/7/11 F~~ MW 8/25/11 Missing the row

S - sieved no orgs

TT - number @ test termination - alive pupae

E - fully emerged and alive

U - unemerged (partial emerged) dead

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: GLW Only Control
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MS

	GLW Only							
	Replicate 1	Replicate 3	Replicate 4	Replicate 5	Replicate 7	Replicate 8	Replicate 10	Replicate 12
	4/21/11	4/18/11	4/22/11	4/16/11	4/18/11	4/22/11	4/14/11	4/20/11
	4/21/11	4/19/11	4/28/11	4/19/11	4/19/11	4/26/11	4/15/11	4/20/11
	4/22/11	4/24/11	4/29/11	4/21/11	4/20/11	5/2/11	4/16/11	4/20/11
	4/22/11	4/25/11	4/29/11	4/24/11	4/24/11	5/3/11	4/18/11	4/26/11
	4/27/11	4/25/11	4/30/11	4/25/11	4/25/11	5/5/11	4/19/11	4/27/11
	4/27/11	4/26/11	5/2/11	4/26/11	4/25/11	4/23/11		4/23/11
	4/29/11	4/27/11	5/2/11	4/26/11	4/25/11			4/28/11
	4/29/11	4/23/11	5/4/11	4/28/11	4/26/11			4/29/11
	4/23/11	4/29/11	5/5/11	4/29/11	4/26/11			4/30/11
	5/2/11	4/29/11	5/7/11	5/1/11	5/1/11			5/2/11
		5/3/11	5/7/11		5/1/11			5/6/11
		5/5/11	5/8/11		5/3/11			5/6/11
earliest hatch date	4/21/11	4/18/11	4/22/11	4/16/11	4/18/11	4/22/11	4/14/11	4/20/11
Day of First Hatch	28	25	29	23	25	29	21	27
total number emerged	10	12	12	10	12	6	5	12
Total number unemerged/dead								
Total number of pupae								

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/18/2011	26	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: GLW Only Control
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	1	2
4/16/2011	2	4
4/17/2011	0	4
4/18/2011	3	7
4/19/2011	4	11
4/20/2011	4	15
4/21/2011	3	18
4/22/2011	4	22
4/23/2011	4	26
4/24/2011	3	29
4/25/2011	6	35
4/26/2011	7	42
4/27/2011	4	46
4/28/2011	3	49
4/29/2011	8	57
4/30/2011	2	59
5/1/2011	3	62
5/2/2011	5	67
5/3/2011	3	70
5/4/2011	1	71
5/5/2011	3	74
5/6/2011	2	76
5/7/2011	2	78
5/8/2011	1	79
5/9/2011	0	79
5/10/2011	0	79
5/11/2011	0	79
5/12/2011	0	79
5/13/2011	0	79

TVA: 5069-03

Clinch River

QC'd by: Nur

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Boardman Sediment Lab Control (LCS)	Test Photoperiod: 16:8
Sample ID: LCS + GLW--Sediment Lab Control	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47

Date: 5/10/11

Overlying Water: Dechlor

Overlying Water Batch ID (GLC Number): ~~8969~~ DS 5/29/11 NA

Number Daily Renewals: 2

☑ DS 6130 renewal time/Initials ☑ DP 1900 renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1400 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			
2			
3			
4			NAV BHV
5			
6			
7			NAV BHV
8			
9			
10			NAV BHV
11	23.0	2.9	
12	23.0	2.8	Nur 5/28/11

Test Day: Day 48

Date: 5/11/11

Overlying Water: Dechlor

Overlying Water Batch ID (GLC Number): NA

Number Daily Renewals: 1

☑ 1010 CB renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1200 Nur chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4	23.0	4.0	7.61	NAV 0 BHV
5	23.0	3.7	7.66	NAV
6				
7				NAV 0 BHV
8				0
9				
10				NAV 0 BHV
11				0
12				0

Nur SL

304
302

NH4+ 0.00 (ec)

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

	Start	End	mL used	
Hardness	2.4	6.1	3.7	148
Alk	21.1	21.5	5.4	108

GLEC Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: LCS/GLW

Concentration: [redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Boardman Sediment Lab Control (LCS)

Sample ID: LCS + GLW--Sediment Lab Control

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/11/11

Tech Initials: AS 8/26/11, MLL 8/29/11, DS 8/27/11, nw 8/29/11, AD 8/29/11, eB 9/1/11

QC initials: AS 8/26/11

9/8/11 mwb signed for Tech in field: NS 8/29/11, SRW 9/1/11, DR 9/1/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/14/11 F	4/16/11 male	4/17/11 M	4/15/11 M	4/14/11 female	4/14/11 male	4/14/11 male	4/13/11 male
2	4/20/11 M	4/20/11 F	4/20/11 M	4/21/11 F	4/15/11 F	4/14/11 M	4/14/11 female	4/17/11 M
3	4/22/11 M	4/22/11 M	4/20/11 M	4/22/11 M	4/17/11 unknown	4/15/11 M	4/16/11 male	4/19/11 M
4	4/25/11 M	4/24/11 F	4/21/11 M	4/22/11 F	4/18/11 F	4/16/11 male	4/22/11 M	4/19/11 M
5	4/26/11 M	4/25/11 M	4/25/11 F	4/24/11 M	4/20/11 M	4/17 1 M AS 8/26	4/26/11 M	4/24/11 F
6	4/26/11 F	5/2/11 F	4/26/11 F	4/24/11 M	4/21/11 F	4/18/11 1 M	4/29/11 F	4/25/11 F
7	4/28/11 * M (NW 8/25/11)	5/3/11 F	4/28/11 M	4/28/11 F	4/22/11 M	4/17 1 unknown AS 8/26	4/30/11 M	4/26/11 M
8	4/29/11 F	5/8/11 F	5/8/11 M	4/28/11 (NS) F	4/22/11 M	4/24/11 M	4/30/11 M	4/29/11 F
9	4/29/11 F	/	4/23/11 M	4/30/11 F	4/29/11 unknown *	/	/	4/30/11 M
10	5/3/11 F	/	/	/	/	/	/	4/27/11 F
11	5/3/11 F	/	/	/	/	/	/	/
12	5/4/11 F	0-TT	TT-1 pupae	0-TT	0-TT	0-TT	0-TT	0-TT

Hatched Totals	12S	8-ES	9ES 1TT	9ES	9ES	8ES	8ES	10ES

20 Day Survival	Rep 1 - 12/12	Rep 3 - 12/12	Rep 6 - 9/12	Rep 9 - 11/12

S= alived ~~cap~~ no cap

TT= number of alive pupae @ test termination

E= fully emerged and alive

U= unemerged dead; including partial emerged/dead.

* Nw for NS 8/25/11

* used one row instead of 2 separate rows; corrected below AS 8/26/11

Hatch Date 4/23/11 not in consecutive order nwt for SRW 8/25/11

M= Male

F= Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: LCS + GLW
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	LCS + GLW							
	Replicate 2	Replicate 4	Replicate 5	Replicate 7	Replicate 8	Replicate 10	Replicate 11	Replicate 12
	4/14/11	4/16/11	4/17/11	4/18/11	4/14/11	4/14/11	4/14/11	4/13/11
	4/20/11	4/20/11	4/20/11	4/21/11	4/15/11	4/14/11	4/14/11	4/17/11
	4/22/11	4/22/11	4/20/11	4/22/11	4/17/11	4/15/11	4/16/11	4/19/11
	4/25/11	4/24/11	4/21/11	4/22/11	4/18/11	4/16/11	4/22/11	4/19/11
	4/26/11	4/25/11	4/25/11	4/24/11	4/20/11	4/17/11	4/26/11	4/24/11
	4/26/11	5/2/11	4/26/11	4/24/11	4/21/11	4/18/11	4/29/11	4/25/11
	4/28/11	5/3/11	4/28/11	4/28/11	4/22/11	4/17/11	4/30/11	4/26/11
	4/29/11	5/8/11	5/8/11	4/29/11	4/22/11	4/24/11	4/30/11	4/29/11
	4/29/11		4/23/11	4/30/11	4/29/11			4/30/11
	5/3/11							4/23/11
	5/3/11							
	5/4/11							
earliest hatch date	4/14/11	4/16/11	4/17/11	4/18/11	4/14/11	4/14/11	4/14/11	4/13/11
Day of First Hatch	21	23	24	25	21	21	21	20
total number emerged	12	8	9	9	9	8	8	10
Total number unemerged/dead								
Total number of pupae			1					

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/15/11	22	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: LCS + GLW
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	1	1
4/14/2011	6	7
4/15/2011	2	9
4/16/2011	3	12
4/17/2011	5	17
4/18/2011	3	20
4/19/2011	2	22
4/20/2011	5	27
4/21/2011	3	30
4/22/2011	7	37
4/23/2011	2	39
4/24/2011	5	44
4/25/2011	4	48
4/26/2011	5	53
4/27/2011	0	53
4/28/2011	3	56
4/29/2011	6	62
4/30/2011	4	66
5/1/2011	0	66
5/2/2011	1	67
5/3/2011	3	70
5/4/2011	1	71
5/5/2011	0	71
5/6/2011	0	71
5/7/2011	0	71
5/8/2011	2	73
5/9/2011	0	73
5/10/2011	0	73
5/11/2011	0	73
5/12/2011	0	73
5/13/2011	0	73

QC'd by: MW

Sample ID: LCS/CRW

Concentration: /

TVA: 5069-03

Clinch River

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Site water (CRW 7.0) with Boardman Sediment Lab Control (LCS)

Sample ID: LCS + CRW

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 46

Date: 5/9/11 dest termination

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

X MW 1245 chemistries time/Initial

Number Daily Renewals: 1

MW 9/7/11 X 1615 EB renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations # @ test MW termination
1					0 found sieved.
2					
3	22.8	7.54	3.0	274.3	0
4					0
5					0
6					0
7					
8	22.8	7.59	3.9	MW 20 273.9	0
9					0
10					
11					
12					0

Start	End	mL Used	Hardness
25.2	28.6	3.4	136

Start	End	mL Used	Alkalinity
30.3	36.0	5.7	114

NH4 = ~~0.0 ll~~ 0.04 MW for EB 8/25/11 EB

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: LCS/CRW
Concentration: /

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: Site water (CRW 7.0) with Boardman Sediment Lab Control (LCS)
Test Photoperiod: 16:8
Sample ID: LCS + CRW
Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*
Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011
Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/9/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/17/11 M	4/15/11 M	4/20/11 M	4/14/11 M	4/15/11 M ~~4/19/11 M~~	4/21/11 F	4/15/11 M	4/15/11 M
2	4/18/11 F	4/16/11 M	4/21/11 M	4/16/11 M	4/15/11 M.	4/22/11 M	4/15/11 M	4/16 2 M
3	4/24/11 M	4/19/11 M	4/22/11 M	4/18/11 F	4/19/11 F	4/25/11 F	4/16 M	4/18/11 F
4	4/24/11 F	4/19/11 M	4/22/11 F	4/22/11 M	4/22/11 M	4/25/11 F	4/16 M	4/18/11 M
5	4/25/11 F ~~4/22/11 F~~ DS 8/29/11	4/21/11 M	4/25/11 M	4/26/11 F	4/22/11 F	4/27/11 F	4/18/11 F	4/20/11 F
6	4/30/11 M	4/24/11 F 8/30/11	4/26/11 M	4/27/11 M	4/24/11 F	4/29/11 F	4/22/11 F	4/21/11 F
7	/	4/25/11 F	4/27/11 F	4/28/11 F	4/24/11 F	4/30/11 F	/	4/21/11 F*
8	4/28/11 F	5/2/11 F	5/2/11 F	4/30/11 F	4/26/11 M	5/01/11 F	/	4/24/11 F
9	4/23/11 F	/	5/4/11 F	5/01/11 F	4/29/11 F ~~4/29/11 F~~	5/4/11 F	/	/
10	/	4/23/11 M	5/6/11 F	5/2/11 F	4/29/11 F	/	/	/
11	/	/	/	4/23/11 F	4/30/11 F	/	0-TT	0-TT
12	0-TT	0-TT	0-TT	0-TT	0-TT	0-TT ~~4/23/11 F~~		0-TT

Hatched Totals	8-ES	9-ES	10-ES	11-ES	11-ES	9-ES	6-ES	8-ES

20 Day Survival	Rep 2 - 10 /12	Rep 7 - 10 /12	Rep 10 - 10 /12	Rep 11 - 12 /12

Hatch Date 4/23/11 not in consecutive order

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
NW 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

Tech in field
SR 9/1/11
NS 9/1/11
DR 9/1/11

9/6/11 AD
* Recorded Daily Data Sheet NS 4/21/11
QC'd - NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: LCS + CRW Control
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	LCS + CRW							
	Replicate 1	Replicate 3	Replicate 4	Replicate 5	Replicate 6	Replicate 8	Replicate 9	Replicate 12
	4/17/11	4/15/11	4/20/11	4/14/11	4/15/11	4/21/11	4/15/11	4/15/11
	4/18/11	4/16/11	4/21/11	4/16/11	4/15/11	4/22/11	4/15/11	4/16/11
	4/24/11	4/19/11	4/22/11	4/18/11	4/19/11	4/25/11	4/16/11	4/18/11
	4/24/11	4/19/11	4/22/11	4/22/11	4/22/11	4/25/11	4/16/11	4/18/11
	4/25/11	4/21/11	4/25/11	4/26/11	4/22/11	4/27/11	4/18/11	4/20/11
	4/30/11	4/24/11	4/26/11	4/27/11	4/24/11	4/29/11	4/22/11	4/21/11
	4/23/11	4/25/11	4/27/11	4/28/11	4/24/11	4/30/11		4/21/11
	4/23/11	5/2/11	5/2/11	4/30/11	4/26/11	5/1/11		4/24/11
		4/23/11	5/4/11	5/1/11	4/29/11	5/4/11		
			5/6/11	5/2/11	4/29/11			
				4/23/11	4/30/11			
earliest hatch date	4/17/11	4/15/11	4/20/11	4/14/11	4/15/11	4/21/11	4/15/11	4/15/11
Day of First Hatch	24	22	27	21	22	28	22	22
total number emerged	8	9	10	11	11	9	6	8
Total number unemerged/dead								
Total number of pupae								

4/21/2011: emergence had been recorded on daily data sheets not emergence data sheets
4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: LCS + CRW Control
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	6	7
4/16/2011	5	12
4/17/2011	1	13
4/18/2011	5	18
4/19/2011	3	21
4/20/2011	2	23
4/21/2011	5	28
4/22/2011	7	35
4/23/2011	4	39
4/24/2011	6	45
4/25/2011	5	50
4/26/2011	3	53
4/27/2011	3	56
4/28/2011	1	57
4/29/2011	3	60
4/30/2011	4	64
5/1/2011	2	66
5/2/2011	3	69
5/3/2011	0	69
5/4/2011	2	71
5/5/2011	0	71
5/6/2011	1	72
5/7/2011	0	72
5/8/2011	0	72
5/9/2011	0	72
5/10/2011	0	72
5/11/2011	0	72
5/12/2011	0	72
5/13/2011	0	72

TVA: 5069-03

Clinch River

QC'd by: Nur

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8897	Test Photoperiod: 16:8
Sample ID: CRS + CRW (Clinch Reference + CRM 7.0)	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47
Date: 5/10/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969
Number Daily Renewals:
DS 6:40 renewal time/Initials ☐ / renewal time/Initials
☐ / renewal time/Initials ☐ / renewal time/Initials
Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☒ no ☐ n/a

Hardness: 136
end: 4.8
start: 1.4
used: 3.4

Alkalinity: 108
end: 27.5
start: 22.1
used: 5.4

Test Day: Day 48
Date: 5/11/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number):
Number Daily Renewals:
☐ renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☐ n/a

☑ 1000 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations pH	SC	Nur 5/26/11
1					
2	22.7	~~2.0~~ 4.0	7.64	280.6	0
3		Nur 5/26/11			
4					
5					
6		4.2			0
7	22.7	~~2.0~~ 4.4	7.71	276.4	0
8		Nur 5/26/11			0
9					
10					
11					0
12					0

NH4= 0.06

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRS/CRW

Concentration: /

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8897

Sample ID: CRS- CRM 7.0 (Clinch Reference)

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/10/11

Tech Initials:
AS 4/26/11
DS 8/29/11
MLL 8/29/11
SRW 8/29/11
AD 8/29/11
EB 9/1/11
Technical Field: DS 9/1/11
MWO signed for 9/1/11 SRW 9/1/11 DK 9/1/11

QC Initials:
AS 8/26/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/19/11 f	4/19/11 F	4/15/11 M	4/18/11 M	4/15/11 m	4/15/11 M	4/18/11 F 8/29/11	4/14/11 M
2	4/22/11 m	4/22/11 m	4/17/11 unknown	4/18/11 F	4/18/11 M	4/17/11 M	4/20/11 M	4/18/11 M
3	4/24/11 m	4/24/11 M	4/18/11 M	4/18/11 M	4/19/11 M	4/22/11 m	4/26/11 f	4/19/11 M
4	4/23/11 ~~4/25/11~~ F DS 8/29/11	5/01/11 F	4/18/11 m	4/21/11 M	4/20/11 F	4/25/11 M	4/26/11 M	4/22/11 m
5	4/26/11 M	5/01/11 F	4/19/11 m	4/24/11 M	4/28/11 M	4/25/11 M	4/28/11 M	4/22/11 m
6	4/28/11 M	5/2/11 F	4/19/11 m	4/25/11 F	5/2/11	4/26/11 F	4/29/11 F	4/27/11 F ~~4/25/11 F~~ DS 8/29/11
7	4/29/11 F	5/4/11 F	4/20/11 M	4/28/11 F		4/27/11 F	5/3/11 F	4/29/11 F
8	4/30/11 F	5/5/11 M	4/22/11 F			5/01/11 F		4/29/11 F
9	4/30/11 F	5/6/11 F	4/26/11 m		4/23/11 F	5/4/11 F		4/29/11 F
10	5/2/11 M DS 8/29/11	5/6/11 M	4/26/11 F			4/23/11 M		4/30/11 M
11	~~5/2/11 F~~ 5/4/11 F DS 8/29/11					5/4/11 M		5/7/11 F
12	5/6/11 F	O-TT	O-TT	O-TT	O-TT	5/7/11 F	O-TT	O-TT
Hatched Totals	12S	10-ES	10-ES	6-ES 1-U	7ES	12S	7ES	11ES

20 Day Survival	Rep 3 - 12/12	Rep 4 - 12/12	Rep 5 - 9/12	Rep 10 - 11/12

Hatch Date 4/23/11 not in consecutive order

4/24/11 Rep 7 1M partial Emerged and Dead
MWO for SRW 8/25/11

S: sieved no stop.
TT: number @ test termination - alive pupae
E: fully emerged and alive
U: unemerged (partial emergence)/dead

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRS +CRW Control
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRS + CRW							
	Replicate 1	Replicate 2	Replicate 6	Replicate 7	Replicate 8	Replicate 9	Replicate 11	Replicate 12
	4/19/11	4/19/11	4/15/11	4/18/11	4/15/11	4/15/11	4/18/11	4/14/11
	4/22/11	4/22/11	4/17/11	4/18/11	4/18/11	4/17/11	4/20/11	4/18/11
	4/24/11	4/24/11	4/18/11	4/18/11	4/19/11	4/22/11	4/26/11	4/19/11
	4/25/11	5/1/11	4/18/11	4/21/11	4/20/11	4/25/11	4/26/11	4/22/11
	4/26/11	5/1/11	4/19/11	4/24/11	4/28/11	4/25/11	4/28/11	4/22/11
	4/28/11	5/2/11	4/19/11	4/25/11	5/2/11	4/26/11	4/29/11	4/27/11
	4/29/11	5/4/11	4/20/11	4/28/11	4/23/11	4/27/11	5/3/11	4/29/11
	4/30/11	5/5/11	4/22/11			5/1/11		4/29/11
	4/30/11	5/6/11	4/26/11			5/4/11		4/29/11
	5/2/11	5/6/11	4/26/11			4/23/11		4/30/11
	5/4/11					5/4/11		5/7/11
	5/6/11					5/7/11		
earliest hatch date	4/19/11	4/19/11	4/15/11	4/18/11	4/15/11	4/15/11	4/18/11	4/14/11
Day of First Hatch	26	26	22	25	22	22	25	21
total number emerged-alive	12	10	10	6	7	12	7	11
Total number unemerged/dead				1				
Total number of pupae								

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRS +CRW Control
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	3	4
4/16/2011	0	4
4/17/2011	2	6
4/18/2011	8	14
4/19/2011	6	20
4/20/2011	3	23
4/21/2011	1	24
4/22/2011	6	30
4/23/2011	2	32
4/24/2011	2	34
4/25/2011	4	38
4/26/2011	6	44
4/27/2011	2	46
4/28/2011	4	50
4/29/2011	5	55
4/30/2011	3	58
5/1/2011	3	61
5/2/2011	3	64
5/3/2011	1	65
5/4/2011	4	69
5/5/2011	1	70
5/6/2011	3	73
5/7/2011	2	75
5/8/2011	0	75
5/9/2011	0	75
5/10/2011	0	75
5/11/2011	0	75
5/12/2011	0	75
5/13/2011	0	75

QC'd by: MW

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Sample ID: CRM 1.5 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 46

Date: 5/9/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

Number Daily Renewals: 1

MW 4/11/11

☒ 615 LB renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

☒ Nov/Mar chemistries time/Initial

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations #@ dest termination
MW 2					
4/25/11 MW 1	22.8	7.62	3.5	277.8	2 pupae
3					
4					0
5					1 pupae
6					0
7	22.8	7.67	4.0	280.2	2 pupae
8					
9					
10					
11					
12					

Start	End	mL Used	Hardness
21.6	25.2	3.6	144

Start	End	mL Used	Alkalinity
24.6	30.3	5.7	114

NH4 = 0.02 U (eb)

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Sample ID: CRM 1.5 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/9/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)
1	8/29/11 D 5 4/20/11 4/13/11 29	4/21/11 M	4/17/11 male	4/14/11 M	4/18/11 M	4/21/11 M	4/10/11 male	4/16/11 male
2	8/29/11 D 5 4/20/11 4/13/11 M	4/27/11 F	4/21/11 M	4/14/11 M	4/22/11 M	4/23/11 M	4/19/11 F	4/20/11 M
3	4/21/11 M	4/27/11 M	4/24/11 F	4/19/11 M	4/22/11 M	4/25/11 M	4/20/11 F	4/22/11 M
4	4/22/11 F	4/29/11 M	4/24/11 M	4/19/11 M	4/22/11 F	4/30/11 F	4/25/11 F	~~4/24/11 AS~~ 4/24/11 M mwr for SRW 8/25/11
5	4/24/11 M	4/29/11 F	4/25/11 M	4/22/11 M	4/22/11 F		4/25/11 M	4/25/11 M
6	4/24/11 F	4/29/11 F	4/26/11 M	4/28/11 F	4/25/11 M		4/27/11 F	4/25/11 M
7	4/24/11 F	mwr 4/29/11 M 8/26/11	4/30/11 F	4/21/11 F *	4/26/11 F		4/27/11 F	4/25/11 M
8	4/28/11 F AS 8/24/11	5/3/11 F	5/01/11 F	4/25/11 F	5/01/11 F		4/23/11 M	4/26/11 F
9	4/30/11 F	5/4/11 F			5/3/11 F		4/23/11 M	4/26/11 F
10		5/4/11 F	4/23/11 M				4/28/11 mwr for AS 8/29/11 F	4/26/11 M
11		5/4/11 M				(4) 2-TT 4 chironomids 4/25/11 dead - noted on data sheets	4/30/11 F	5/01/11 F
12	2-TT	5/5/11 M	0-TT	1-TT	0-TT		4/30/11 F	5/5/11 M
Hatched Totals	9E^S + 2TT	12^S E	9ES	8E^S + 1TT	9ES	4E^S + 4U + 2TT	12^S	12^S

20 Day Survival	Rep 3 - 12/12	Rep 8 - 10+2p/12	Rep 10 - 12/12	Rep 12 - 11+1p/12

Hatch Date 4/22/11 not in Consecutive order mwr for SRW 8/29/11 S = sieved no crop found (4) mwr for NS 8/25/11

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
mwr 8/29/11
AD 8/29/11
EB 9/1/11
Tech in Field: NS 9/1/11
DR 9/1/11
SRW 9/1/11

QC Initials:
AS 8/26/11

AD 9/6/11
* Recorded on Daily Data Sheet AD 4/21
QC'd - NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 1.5-10%							
	Replicate 1	Replicate 2	Replicate 4	Replicate 5	Replicate 6	Replicate 7	Replicate 9	Replicate 11
	4/20/11	4/21/11	4/17/11	4/14/11	4/18/11	4/21/11	4/16/11	4/16/11
	4/20/11	4/27/11	4/21/11	4/14/11	4/22/11	4/23/11	4/19/11	4/20/11
	4/21/11	4/27/11	4/24/11	4/19/11	4/22/11	4/25/11	4/20/11	4/22/11
	4/22/11	4/29/11	4/24/11	4/19/11	4/22/11	4/30/11	4/25/11	4/24/11
	4/24/11	4/29/11	4/25/11	4/22/11	4/22/11		4/25/11	4/25/11
	4/24/11	4/29/11	4/26/11	4/22/11	4/25/11		4/27/11	4/25/11
	4/24/11	4/29/11	4/30/11	4/21/11	4/26/11		4/27/11	4/25/11
	4/28/11	5/3/11	5/1/11	4/25/11	5/1/11		4/23/11	4/26/11
	4/30/11	5/4/11	4/23/11		5/3/11		4/23/11	4/26/11
		5/4/11					4/28/11	4/26/11
		5/4/11					4/30/11	5/1/11
		5/5/11					4/30/11	5/5/11
earliest hatch date	4/20/11	4/21/11	4/17/11	4/14/11	4/18/11	4/21/11	4/16/11	4/16/11
Day of First Hatch	27	28	24	21	25	28	23	23
total number emerged-alive	9	12	9	8	9	4	12	12
Total number unemerged/dead						4		
Total number of pupae	2			1		2		

4/21/2011: emergence had been recorded on daily data sheets not emergence data sheets
4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	25	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	2	2
4/15/2011	0	2
4/16/2011	2	4
4/17/2011	1	5
4/18/2011	1	6
4/19/2011	3	9
4/20/2011	4	13
4/21/2011	5	18
4/22/2011	8	26
4/23/2011	4	30
4/24/2011	6	36
4/25/2011	9	45
4/26/2011	5	50
4/27/2011	4	54
4/28/2011	2	56
4/29/2011	4	60
4/30/2011	5	65
5/1/2011	3	68
5/2/2011	0	68
5/3/2011	2	70
5/4/2011	3	73
5/5/2011	2	75
5/6/2011	0	75
5/7/2011	0	75
5/8/2011	0	75
5/9/2011	0	75
5/10/2011	0	75
5/11/2011	0	75
5/12/2011	0	75
5/13/2011	0	75

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

QC'd by: NW Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47	Test Day: Day 48
Date: 5/10/11	Date: 5/11/11
Overlying Water: CRM 7.0 Site Water (CRW)	Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969	Overlying Water Batch ID (GLC Number): 8969
Number Daily Renewals: 2	Number Daily Renewals: 1
☒ 1530 renewal time/Initials ☒ DR 1900 renewal time/Initials	☑ 640 RB renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials	☐ — renewal time/Initials ☐ — renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate	Food: TFS (Tetrafin 4g/L)# — ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a	Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1400 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2			|
3			|
4			|
5			|
6			
7			NAV BHV
8	22.9	3.2	~~NAV~~ NAV |
9			
10	23.0	3.7	NAV BHV
11			
12			

☑ 0830 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations	* 8 drop 8 tetrafin NW
1				NAV	1 purge
2	21.9	4.2	7.81	|	1 purge 281.9
3	22.1	4.3	7.89	|	1 purge 281.5
4				|	0
5				|	1 purge
6					
7				NAV	BHV 0
8				|	1 2 purge
9					
10				NAV	0
11					
12					

NH4 U.O. Page 1 of 438

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

	Start	End	mL Used	
Hardness	42.1	45.5	3.4	136
Alkal.	[illegible]	21.1	5.4	108

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5
Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889
Sample ID: CRM 1.5 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/11/11 DS 8/29/11

Tech Initials:
AS 8/26/11
MLL 8/29/11
nwr 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

nwr signed for 9/7/11
Tech in field:
SRW 9/1/11
NS 9/1/11
DR 9/1/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)
1	4/11/11 M	4/19/11 M	4/14/11 F	4/15 male	4/17/11 male	4/15/11 M	4/13/11 M	4/14/11 M
2	4/16/11 male	4/22/11 M	4/18/11 M	4/16/11 male	4/18/11 M	4/18/11 M	4/16/11 unknown	4/14/11 M
3	4/18/11 M	4/24/11 M	4/21/11 M	4/18/11 M	4/22/11 F	4/18/11 F	4/18/11 M	4/14/11 M
4	4/18/11 M	4/29/11 F	4/22/11 F	4/24/11 M	4/29/11 F	4/21/11 F	4/24/11 F	4/20/11 DS 8/29/11 ~~4/20/11~~ M
5	4/25/11 F	4/30/11 F	4/22/11 M	4/24/11 F	4/30/11 M	4/22/11 F	4/25/11 F	4/23/11 F
6	4/27/11 M	5/01/11 M	4/22/11 M	4/25/11 DS 8/6/11 ~~4/25/11~~ F	5/2/11 M	4/26/11 F	4/25/11 F	4/26/11 F
7	5/01/11 M	5/2/11 M	*4/24/11 M	4/26/11 M	/	4/23/11 F	5/2/11 F	4/26/11 M
8	5/2/11 F	5/5/11 M	5/3/11 F	4/29/11 M	/	4/27/11 M	/	4/27/11 F
9	/	5/8/11 F	5/3/11 M	4/30/11 F	/	4/30/11 DS 8/29/11 ~~4/30/11~~ F	/	4/27/11 F
10	/	5/8/11 F	/	/	1 chiro dead 4/30 - noted on data sheet	5/01/11 F	/	4/28 AS 8/26/11 ~~4/28/11~~ F
11	/	/	/	/	1 chir. dead noted on data sheet 4/26	/	/	/
12	/	/	/	/	one chironomid 4/25 dead - noted on data sheets	nwr 8/25 NS 8/25/11	/	/
Hatched Totals	8E^S + 1TT	10E^S + 1TT	9E^S + 1TT	9E^S	6E^S + 3U + 1TT	10E^S + 0TT	7E^S + 2TT	10E^S
20 Day Survival	Rep 6 - 10 /12 (nwr 8/25/11)		Rep 9 - 10 /12		Rep 11 - 11 /12		Rep 12 - 12 /12	

Hatch Date 4/23/11 not in consecutive order & emerging slow 4/24/11 Rep 3 - nwr for SRW 8/25/11

M = Male

F = Female

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 1.5-20%							
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Replicate 7	Replicate 8	Replicate 10
	4/14/11	4/19/11	4/14/11	4/15/11	4/17/11	4/15/11	4/13/11	4/14/11
	4/16/11	4/22/11	4/18/11	4/16/11	4/18/11	4/18/11	4/16/11	4/14/11
	4/18/11	4/24/11	4/21/11	4/18/11	4/22/11	4/18/11	4/18/11	4/14/11
	4/18/11	4/29/11	4/22/11	4/24/11	4/29/11	4/21/11	4/24/11	4/20/11
	4/25/11	4/30/11	4/22/11	4/24/11	4/30/11	4/22/11	4/25/11	4/23/11
	4/27/11	5/1/11	4/22/11	4/25/11	5/2/11	4/26/11	4/25/11	4/26/11
	5/1/11	5/2/11	4/24/11	4/26/11		4/23/11	5/2/11	4/26/11
	5/2/11	5/5/11	5/3/11	4/29/11		4/27/11		4/27/11
		5/8/11	5/3/11	4/30/11		4/30/11		4/27/11
		5/8/11				5/1/11		4/28/11
					4/30-1 dead chiro			
					4/26-1 dead chiro			
					4/25-one dead chiro			
earliest hatch date	4/14/11	4/19/11	4/14/11	4/15/11	4/17/11	4/15/11	4/13/11	4/14/11
Day of First Hatch	21	26	21	22	24	22	20	21
total number emerged-alive	8	10	9	9	6	10	7	10
Total number unemerged/dead			0					
Total number of pupae	1	1	1	0	1		2	
Dead larvae and pupae					3			

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/15/11	22	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	1	1
4/14/2011	5	6
4/15/2011	2	8
4/16/2011	3	11
4/17/2011	1	12
4/18/2011	8	20
4/19/2011	1	21
4/20/2011	1	22
4/21/2011	2	24
4/22/2011	6	30
4/23/2011	2	32
4/24/2011	5	37
4/25/2011	4	41
4/26/2011	4	45
4/27/2011	4	49
4/28/2011	1	50
4/29/2011	3	53
4/30/2011	4	57
5/1/2011	3	60
5/2/2011	4	64
5/3/2011	2	66
5/4/2011	0	66
5/5/2011	1	67
5/6/2011	0	67
5/7/2011	0	67
5/8/2011	2	69
5/9/2011	0	69
5/10/2011	0	69
5/11/2011	0	69
5/12/2011	0	69
5/13/2011	0	69

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

QC'd by: AWT Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47
Date: 5/10/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969
Number Daily Renewals: 1
DS 6:30 renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials
Food: TFS (Tetrafin 4g/L)# — ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Hardness: 128
end: 8.0
start: 4.8
used: 3.2
Alkalinity: 110
end: 33.0
start: 27.5
used: 5.5

Test Day: Day 48
Date: 5/11/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number):
Number Daily Renewals:
☐ renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☐ n/a

JCB 1000 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations pH	SC	* % start elimination Nuc
1					
2					
3	22.8	4.0	7.70	276.9	1 pupae 4
4					
5					0
6					
7					0
8					
9					
10					
11					
12	22.8	4.0	7.67	276.6	0

NH4= 0.02

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5
Concentration: 40%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889
Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 40%
Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*
Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011
Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/10/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/21/11 F	4/18/11 M	4/17/11 male	4/14/11 M	4/15/11 m	4/14/11 M	4/20/11 M	4/17/11 male
2	4/22/11 m	4/21/11 F	1/2 emerged/dead 4/17/11 unknown	4/17/11 male	4/15/11 m	4/16/11 unknown	4/22/11 m	4/17/11 male
3	4/22/11 m	4/22/11 m	1/2 emerged/dead 4/17/11 unknown	4/19/11 M	4/16/11 male	4/18/11 M	4/22/11 F	4/18/11 M
4	4/24/11 M	4/21/11 M*	1/2 emerged/dead 4/17/11 unknown	4/22/11 m	4/16/11 male	4/24/11 F	4/22/11 F	4/19/11 M
5	4/25/11 F	4/24/11 F	4/22/11 m	4/22/11 m	4/17/11 male	4/25/11 F	4/24/11 M	4/20/11 F
6	4/25/11 F	4/24/11 F	4/22/11 m	4/22/11 F	4/20/11 M	4/26/11 F	4/26/11 F	4/21/11 M
7	4/26/11 M	4/27/11 F	5/2/11 F	4/22/11 M	4/30/11 F	4/27/11 F	4/28/11 F	4/23/11 F
8	5/01/11 M	4/23/11 F	/	4/24/11 M	5/2/11 m	5/01/11 F	5/2/11 m	4/30/11 F
9	5/01/11 F	5/7/11 F	4/23/11 F	4/25/11 F	/	/	/	/
10	5/2/11 F	/	/	4/23/11 M	/	/	/	/
11	5/3/11 F	/	/	4/28/11 F	/	4/23/11 F	/	/
12	5/5/11 M	/	1 chironomid dead - noted on data sheets 4/25	4/28/11 F	/	/	4/23/11 F	/
Hatched Totals	12S	9E5 1TT	5E3 4U	12S	8E5 0TT	9ES	9ES	8ES

20 Day Survival	Rep 1 - 12/12	Rep 4 - 12/12	Rep 10 - 12/12	Rep 11 - 10/12

Hatch Date 4/23/11 not in consecutive order new for SEW 8/25/11

S = sediment sieved - no organisms remaining

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
new 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

new signed for Tech in field: 9/7/11
SRB 9/1/11
NS 9/1/11
DR 9/1/11

AD 9/6/11
* Recorded on Daily Data Sheet on 4/21/11 QC'd - NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MES

	CRM 1.5-40%							
	Replicate 2	Replicate 3	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 9	Replicate 12
	4/21/11	4/18/11	4/17/11	4/14/11	4/15/11	4/14/11	4/20/11	4/17/11
	4/22/11	4/21/11	4/17/11	4/17/11	4/15/11	4/16/11	4/22/11	4/17/11
	4/22/11	4/22/11	4/17/11	4/19/11	4/16/11	4/18/11	4/22/11	4/18/11
	4/24/11	4/21/11	4/17/11	4/22/11	4/16/11	4/24/11	4/22/11	4/19/11
	4/25/11	4/24/11	4/22/11	4/22/11	4/17/11	4/25/11	4/24/11	4/20/11
	4/25/11	4/24/11	4/22/11	4/22/11	4/20/11	4/26/11	4/26/11	4/21/11
	4/26/11	4/27/11	5/2/11	4/22/11	4/30/11	4/27/11	4/28/11	4/23/11
	5/1/11	4/23/11	4/23/11	4/24/11	5/2/11	5/1/11	5/2/11	4/30/11
	5/1/11	5/7/11		4/25/11		4/23/11	4/23/11	
	5/2/11			4/23/11				
	5/3/11			4/28/11				
	5/5/11			4/28/11				
			4/25-one dead chiro					
earliest hatch date	4/21/11	4/18/11	4/17/11	4/14/11	4/15/11	4/14/11	4/20/11	4/17/11
Day of First Hatch	28	25	24	21	22	21	27	24
total number emerged-alive	12	9	5	12	8	9	9	8
Total number unemerged/dead			3					
Total number of pupae		1						
Dead larvae and pupae			1					

4/21/2011: emergence had been recorded on daily data sheets not emergence data sheets
4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	2	2
4/15/2011	2	4
4/16/2011	3	7
4/17/2011	5	12
4/18/2011	3	15
4/19/2011	2	17
4/20/2011	3	20
4/21/2011	4	24
4/22/2011	12	36
4/23/2011	6	42
4/24/2011	6	48
4/25/2011	4	52
4/26/2011	3	55
4/27/2011	2	57
4/28/2011	3	60
4/29/2011	0	60
4/30/2011	2	62
5/1/2011	3	65
5/2/2011	4	69
5/3/2011	1	70
5/4/2011	0	70
5/5/2011	1	71
5/6/2011	0	71
5/7/2011	1	72
5/8/2011	0	72
5/9/2011	0	72
5/10/2011	0	72
5/11/2011	0	72
5/12/2011	0	72
5/13/2011	0	72

QC'd by: [illegible]

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Sample ID: CRM 1.5 Concentration: 60%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 46

Date: 5/9/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

[illegible] 1200 chemistries time/Initial

Number Daily Renewals:

DS 6:15 renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations *@ last termination [illegible]
1	22.8	7.53	4.2	279.7	0
2	22.8	7.60	3.7	277.4	0
3	/	/	/	/	/
4					
5					2 pupae
6					2 pupae
7					
8					0
9					0
10					
11					
12					1 pupae

Start	End	mL Used	Hardness
18.2	21.6	3.4	136

Start	End	mL Used	Alkalinity
19.1	24.~~6~~ 5	5.4	108

NH4= ~~0.03 U~~ 0.01 U J

EB [illegible] for EB 8/25/11

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

Concentration: 60%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Test Photoperiod: 16:8

Sample ID: CRM 1.5 Concentration: 60%

Test System: 175mL Manual Delivery

Test Species: *Chironomus dilutus*

Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011

Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/9/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/14/11 m	4/22/11 m	4/16/11 male	4/16/11 F	4/18/11 M	4/20/11 M *	4/15/11 M	4/18/11 M
2	4/19/11 M	4/25/11 F	4/16/11 male	4/26/11 F	4/19/11 M	4/25/11 M	4/18/11 F	4/18/11 M
3	4/20/11 M	4/25/11 F	4/16/11 male	4/26/11 F	4/26/11 F	4/25/11 M	4/22/11 M	4/18/11 M
4	4/20/11 M	4/26/11 F	4/18/11 M	4/29/11 F	4/26/11 F	4/27/11 DS 8/29/11 ~~4/27/11~~ F	4/23/11 M	4/22/11 M
5	4/24 F	4/29/11 M	4/22/11 M	5/01/11 F	4/29/11 F	4/29/11 M	4/23/11 F	4/26/11 M
6	4/25/11 M	4/30/11 F	4/27/11 M	5/3/11 F	4/30/11 M	4/30/11 F	4/24 ~~4/23~~ (5) M	4/30/11 F
7	4/26/11 M	4/30/11 F	4/29/11 F	5/4/11 M	5/2/11 M	5/2/11 F	4/24 ~~4/23~~ (5) F	5/2/11 M
8			4/30/11 F			4/23/11 M	4/26/11 F	
9			4/23/11 M			5/3/11 F	4/28/11 DS 8/29/11 ~~4/28/11~~ M	
10	4/23/11 M		4/23/11 F			5/3/11 F	5/2/11 F	
11	4/23/11 M		4/23/11 F					
12	4/23/11 M		4/23/11 F					2 chir. dead noted on data sheet 4/26 — mult for NS 8/25/11
Hatched Totals	10E^S	7E^S	12^S	7E^S + 2TT	7E^S + 2TT	10E^S	10E^S	7E^S + 1TT + 2U
20 Day Survival	Rep 4 - 11 /12		Rep 7 - 11 /12		Rep 10 - 12 /12		Rep 11 - 12 /12	

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
NW 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

(5) - mult for SRW 8/25/11

mult signed for Tech initials 9/7/11
NS 9/1/11
SRW 9/1/11
DR 9/1/11

Hatch Date 4/23/11 not in consecutive order
Mult for SRW 8/25/11

S - sieved no org.

9/6/11 AN
* Recorded on 4/21/11 Daily Data Sheet.
QCd - NS

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 1.5-60%							
	Replicate 1	Replicate 2	Replicate 3	Replicate 5	Replicate 6	Replicate 8	Replicate 9	Replicate 12
	4/14/11	4/22/11	4/16/11	4/16/11	4/18/11	4/20/11	4/15/11	4/18/11
	4/19/11	4/25/11	4/16/11	4/26/11	4/19/11	4/25/11	4/18/11	4/18/11
	4/20/11	4/25/11	4/16/11	4/26/11	4/26/11	4/25/11	4/22/11	4/18/11
	4/20/11	4/26/11	4/18/11	4/29/11	4/26/11	4/27/11	4/23/11	4/22/11
	4/24/11	4/29/11	4/22/11	5/1/11	4/29/11	4/29/11	4/23/11	4/26/11
	4/25/11	4/30/11	4/27/11	5/3/11	4/30/11	4/30/11	4/24/11	4/30/11
	4/26/11	4/30/11	4/29/11	5/4/11	5/2/11	5/2/11	4/24/11	5/2/11
	4/23/11		4/30/11			4/23/11	4/26/11	
	4/23/11		4/23/11			5/3/11	4/28/11	
	4/23/11		4/23/11			5/3/11	5/2/11	
			4/23/11					
			4/23/11					
earliest hatch date	4/14/11	4/22/11	4/16/11	4/16/11	4/18/11	4/20/11	4/15/11	4/18/11
Day of First Hatch	21	29	23	23	25	27	22	25
total number emerged-alive	10	7	12	7	7	10	10	7
Total number unemerged/dead								2
Total number of pupae				2	2			1

4/21/2011: emergence had been recorded on daily data sheets not emergence data sheets
4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	1	2
4/16/2011	4	6
4/17/2011	0	6
4/18/2011	6	12
4/19/2011	2	14
4/20/2011	3	17
4/21/2011	0	17
4/22/2011	4	21
4/23/2011	10	31
4/24/2011	3	34
4/25/2011	5	39
4/26/2011	8	47
4/27/2011	2	49
4/28/2011	1	50
4/29/2011	5	55
4/30/2011	6	61
5/1/2011	1	62
5/2/2011	4	66
5/3/2011	3	69
5/4/2011	1	70
5/5/2011	0	70
5/6/2011	0	70
5/7/2011	0	70
5/8/2011	0	70
5/9/2011	0	70
5/10/2011	0	70
5/11/2011	0	70
5/12/2011	0	70
5/13/2011	0	70

QC'd by: [illegible]

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Sample ID: CRM 1.5 Concentration: 80%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 2011

Test Day: Day 46

Date: 5/9/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

1015 X [illegible] chemistries time/Initial

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Number Daily Renewals: 1

X DS 6:19 renewal time/Initials ☐ ——— renewal time/Initials

☐ ——— renewal time/Initials ☐ ——— renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes X no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations *@ day termination
1	23.0	7.48	4.0	270.0	0
2					2 pupae
3					1 pupae
4					0
5					1 pupae
6	23.0	7.53	4.0	275.5	1 pupae
7					
8					1 pupae
9					
10					0
11					
12					

Start	End	mL used	Hardness
14.8 ~~18.2~~	18.2	3.4	136

Start	End	mL Used	Alkalinity
13.5	19.1	5.6	112

NH4 = 0.01µ (CB)

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

Concentration: 80%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889

Sample ID: CRM 1.5 Concentration: 80%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/9/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)
1	4/19/11 F	4/15/11 M	4/15/11 ~	4/14/11 M in emergent died	4/17/11 male	4/15/11 M	4/14/11 M	4/18/11 M
2	4/19/11 M	4/22/11 M	4/20/11 F	4/14/11 F died in emergent	4/18/11 M	4/18/11 M	4/14/11 M	4/24/11 M
3	4/20/11 F	4/26/11 M	4/25/11 F	4/15/11 M	4/20/11 M	4/24/11 M	4/25/11 F	4/~~28~~ 28/11 F AS 8/26/11
4	4/20/11 F	4/26/11 M	4/25/11 F	4/10/11 male	4/25/11 unknown	4/25/11 F	4/26/11 F	4/29/11 unknown sex
5	4/21/11 M	4/26/11 F	4/27/11 M	4/20/11 F	4/26/11 F	4/25/11 F	4/27/11 F	4/29/11 M
6	4/26/11 F	4/27/11 F	4/30/11 M	4/25/11 M	4/29/11 F	4/28/11 F	4/~~28~~ 28/11 F AS 8/24/11	4/23/11 M
7	4/27/11 F	4/28/11 M	5/4/11 M	4/26/11 F	5/3/11 M	5/01/11 F	4/23/11 M	
8	~~4/28/11 F~~ for mwr for NJ 8/25/11	5/2/11 F		4/26/11 F			5/3/11 M	
9				4/26/11 F				
10				4/30/11 F				
11				4/12/11 *				
12								
Hatched Totals	7ES	8ES + 2TT	7ES + 1TT	9ES + 2U	7ES + 1TT	7ES + 1TT	8ES + 1TT	6ES
20 Day Survival	Rep 7 - 12/12		Rep 9 - 10/12		Rep 11 - 12/12		Rep 12 - 11/12	

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
MWr 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

MWr signed for Tech in field 9/7/11
SRW 9/1/11
NJ 9/1/11
DR 9/1/11

Hatch Date 4/23/11 not in consecutive order MWr for SRW 8/25/11

* from data sheet MWr 4/12/11

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 1.5-80%							
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Replicate 6	Replicate 8	Replicate 10
	4/19/11	4/15/11	4/15/11	4/14/11	4/17/11	4/15/11	4/14/11	4/18/11
	4/19/11	4/22/11	4/20/11	4/14/11	4/18/11	4/18/11	4/14/11	4/24/11
	4/20/11	4/26/11	4/25/11	4/15/11	4/20/11	4/24/11	4/25/11	4/28/11
	4/20/11	4/26/11	4/25/11	4/16/11	4/25/11	4/25/11	4/26/11	4/29/11
	4/21/11	4/26/11	4/27/11	4/22/11	4/26/11	4/25/11	4/27/11	4/29/11
	4/26/11	4/27/11	4/30/11	4/25/11	4/29/11	4/28/11	4/28/11	4/23/11
	4/27/11	4/28/11	5/4/11	4/26/11	5/3/11	5/1/11	4/23/11	
		5/2/11		4/26/11			5/3/11	
				4/26/11				
				4/30/11				
				4/12/11				
earliest hatch date	4/19/11	4/15/11	4/15/11	4/12/11	4/17/11	4/15/11	4/14/11	4/18/11
Day of First Hatch	26	22	22	19	24	22	21	25
total number emerged-alive	7	8	7	9	7	7	8	6
Total number unemerged/dead				2				
Total number of pupae		2	1		1	1	1	

4/12/2011: emergence had been recorded on daily data sheets not emergence data sheets
4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/15/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	1	1
4/13/2011	0	1
4/14/2011	2	3
4/15/2011	4	7
4/16/2011	1	8
4/17/2011	1	9
4/18/2011	3	12
4/19/2011	2	14
4/20/2011	4	18
4/21/2011	1	19
4/22/2011	2	21
4/23/2011	2	23
4/24/2011	2	25
4/25/2011	7	32
4/26/2011	9	41
4/27/2011	4	45
4/28/2011	4	49
4/29/2011	3	52
4/30/2011	2	54
5/1/2011	1	55
5/2/2011	1	56
5/3/2011	2	58
5/4/2011	1	59
5/5/2011	0	59
5/6/2011	0	59
5/7/2011	0	59
5/8/2011	0	59
5/9/2011	0	59
5/10/2011	0	59
5/11/2011	0	59
5/12/2011	0	59
5/13/2011	0	59

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5

QC'd by: NW

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47
Date: 5/10/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969
Number Daily Renewals: 1
#DS 6:30 renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials
Food: TFS (Tetrafin 4g/L)# — ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☒ no ☐ n/a
✓ EB1000 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations pH	SC	Not dominant
1	22.8	4.4	7.67	276.6	0
2					0
3					
4					0
5					
6					0
7					0
8					
9					0
10	22.7	4.2	7.79	276.4	0
11					0
12					

Hardness (144)
End: 11.6
Start: 8.0
used: 3.6
Alkalinity: (108)
End: 38.4
Start 33.0
used: 5.4
NH4 = 0.07 u

Test Day: Day 48
Date: 5/11/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number):
Number Daily Renewals:
☐ renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☐ n/a
☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 1.5
Concentration: 100%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8889
Sample ID: CRM 1.5 Concentration: 100%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/10/11

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
NWW 8/29/11
AD 8/29/11
EB 9/1/11
QC Initials:
AS 8/26/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 8 7 (Hatch Date/Sex) NWW 9/1/11	Replicate 9 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)
1	4/20/11 M	4/20/11 M	4/20/11 M	4/13/11 M	4/14/11 M	4/14/11 M	4/14/11 M	4/14/11 M
2	4/22/11 F	4/26/11 F	4/25/11 F	4/20/11 F	4/14/11 M	4/14/11 M	4/14/11 M	4/29/11 F
3	4/22/11 M	4/29/11 F	4/27/11 M	4/27/11 F	4/18/11 M	4/14/11 M	4/16/11 female	4/30/11 F
4	4/26/11 F	4/30/11 M	5/01/11 F	4/27/11 F	4/20/11 M	4/23/11 F	4/17/11 male	5/3/11 M
5	4/28/11 F	5/01/11 F	5/3/11 M	4/30/11 F	4/24/11 M	4/24/11 ⑤ F	4/29/11 F	5/4/11 F
6		5/06/11 F		4/23/11 F	4/24/11 F	4/26/11 M		5/5/11 M
7		5/7/11 F	4/23/11 F		4/25/11 DS 8/29/11 ~~4/23/11~~ F			
8					4/25/11 F			
9					4/25/11 F			
10					4/27/11 F			
11								
12								

⑤ NWW for SRW 8/25/11

NWW Signed for ~~Tech~~ NWW 9/1/11
Tech in Field
SRW 9/1/11
NSS 9/1/11
DR 9/1/11

Hatched Totals	5ES	7ES	6ES	6ES	10ES	6ES	5ES	6ES

20 Day Survival	Rep 3 - 10 /12	Rep 5 - 12 /12	Rep ~~8~~ 7 - 12 /12	Rep 12 - 10+1p /12

NWW 9/1/11

Hatch Date 4/23/11 1st in consecutive order
NWW for SRW 8/25/11

M = MALE
F = Female

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 1.5-100%							
	Replicate 1	Replicate 2	Replicate 4	Replicate 6	Replicate ~~8~~ 7	Replicate 9	Replicate 10	Replicate 11
	4/20/11	4/20/11	4/20/11	4/13/11	4/14/11	4/14/11	4/14/11	4/14/11
	4/22/11	4/26/11	4/25/11	4/20/11	4/14/11	4/14/11	4/14/11	4/29/11
	4/22/11	4/29/11	4/27/11	4/27/11	4/18/11	4/14/11	4/16/11	4/30/11
	4/26/11	4/30/11	5/1/11	4/27/11	4/20/11	4/23/11	4/17/11	5/3/11
	4/28/11	5/1/11	5/3/11	4/30/11	4/24/11	4/24/11	4/29/11	5/4/11
		5/6/11	4/23/11	4/23/11	4/24/11	4/26/11		5/5/11
		5/7/11			4/25/11			
					4/25/11			
					4/25/11			
					4/27/11			
earliest hatch date	4/20/11	4/20/11	4/20/11	4/13/11	4/14/11	4/14/11	4/14/11	4/14/11
Day of First Hatch	27	27	27	20	21	21	21	21
total number emerged-alive	5	7	6	6	10	6	5	6
Total number unemerged/dead								
Total number of pupae								

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 1.5-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	1	1
4/14/2011	8	9
4/15/2011	0	9
4/16/2011	1	10
4/17/2011	1	11
4/18/2011	1	12
4/19/2011	0	12
4/20/2011	5	17
4/21/2011	0	17
4/22/2011	2	19
4/23/2011	3	22
4/24/2011	3	25
4/25/2011	4	29
4/26/2011	3	32
4/27/2011	4	36
4/28/2011	1	37
4/29/2011	3	40
4/30/2011	3	43
5/1/2011	2	45
5/2/2011	0	45
5/3/2011	2	47
5/4/2011	1	48
5/5/2011	1	49
5/6/2011	1	50
5/7/2011	1	51
5/8/2011	0	51
5/9/2011	0	51
5/10/2011	0	51
5/11/2011	0	51
5/12/2011	0	51
5/13/2011	0	51

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0

QC'd by: [illegible] Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 10%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47	Test Day: Day 48
Date: 5/10/11	Date: 5/11/11 test termination
Overlying Water: CRM 7.0 Site Water (CRW)	Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969	Overlying Water Batch ID (GLC Number): 89169
Number Daily Renewals: 2	Number Daily Renewals: 1
☑ DS 6:30 renewal time/Initials ☑ DR 1900 renewal time/Initials	☑ 640 EB renewal time/Initials ☐ / renewal time/Initials
☐ / renewal time/Initials ☐ / renewal time/Initials	☐ / renewal time/Initials ☐ / renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate	Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a	Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1400 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV BHV
2			
3			
4			NAV BHV
5			
6			
7			
8			NAV BHV — still here [illegible] 4/14
9		3.7	NAV BHV
10			
11	22.9		NAV BHV
12	22.9	3.6	

☑ 0830 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations	# of pupae Clear Exoskeleton
1				NAV	1 pupae
2					
3					
4				NAV	0
5		7.81	7.74		1 pupae 277.7
6					
7					
8		7.75	7.83	NAV	BHV — 281.3 still exists (Tech error)
9					0
10					
11	22.8			NAV	0
12	22.8				1 pupae

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

* 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.

	Start	End	mL used	Terminated Reps
Hardness	9.5	12.7	3.2	128
Alkalinity	44.2	47.2	5.5	110

NH4= 0.720 EB

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891

Sample ID: CRM 2.0 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/11/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/15/11 m	4/13/11 * NS male (NWS for NS 8/25/11)	4/22/11 m	4/14/11 M	4/14/11 M	4/18/11 M	4/16/11 male	4/20/11 m
2	4/18/11 m	4/16/11 female	4/27/11 F	4/22/11 M	4/18/11 M	4/19/11 M	4/16/11 male	4/23/11 M – drowned/dead on surface of H2O EB 9/1/11
3	4/18/11 M	4/20/11 M	5/4/11 F	4/22/11 M	4/19/11 M	4/19/11 M	4/18/11 M	4/24/11 M
4	4/25/11 M	4/21/11 F	5/4/11 M	4/25/11 F	4/19/11 M	4/20/11 M	4/21/11 M	4/24/11 M
5	4/27/11 F	4/28/11 M ~~4/27/11 F~~ DS 8/29/11	5/5/11 F	4/27/11 M	4/20/11 M	4/20/11 M	4/22 unknown	4/24/11 F
6	5/4/11 M	4/30/11 M		4/28/11 M	4/20/11 F	4/20/11 F	4/24/11 M	5/01/11 F
7	5/4/11 F	5/1/11 F		4/30/11 F	4/24/11 died w/o emerged	4/22/11 M	4/25/11 M	5/4/11 M
8	4/23/11 F	4/13/11 * M		5/01/11 M	4/25/11 M	4/25/11 DS 9/6/11 ~~4/25/11~~ F	4/25/11 F	5/8/11 F
9	5/4/11 F			4/23/11 M	4/27/11 F	4/25/11 F	4/30/11 DS 9/6/11 ~~4/30/11~~ M	
10	4/12/11 * UK			5/3/11 F	4/28/11 F	4/26/11 F	4/30/11 F	
11				5/5/11 M			5/3/11 F	
12				ichiro dead 4/28/11 noted on data sheets			5/5/11 M	
Hatched Totals	10E^S + 1TT	8E^S	5E^S + 1TT	11E^S ~~2~~ 1U (MWS 8/25/11)	9E^S 1U	10E^S	12^S	7E^S + 1TT + 1U
20 Day Survival	Rep 2 - 11 1/p /12		Rep 3 - 12 /12		Rep 7 - 9 1/p /12		Rep 10 - 10 /12	

Hatch Date 4/22/11 not in consecutive order MWS for SRW 8/25/11

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

* from data sheet - MWS 8/25/11

S = Sieved no orgs.

M = MALE
Female = F

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
MWS 8/29/11
AD 8/29/11

QC Initials:
AS 8/26/11

MWS signed for 9/7/11
Tech in field
SRW 9/1/11
NS 9/1/11
DR 9/1/11

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 2.0-10%							
	Replicate 1	Replicate 4	Replicate 5	Replicate 6	Replicate 8	Replicate 9	Replicate 11	Replicate 12
	4/15/11	4/13/11	4/22/11	4/14/11	4/14/11	4/18/11	4/16/11	4/22/11
	4/18/11	4/16/11	4/27/11	4/22/11	4/18/11	4/19/11	4/16/11	4/23/11
	4/18/11	4/20/11	5/4/11	4/22/11	4/19/11	4/19/11	4/18/11	4/24/11
	4/25/11	4/21/11	5/4/11	4/25/11	4/19/11	4/20/11	4/21/11	4/24/11
	4/27/11	4/28/11	5/5/11	4/27/11	4/20/11	4/20/11	4/22/11	4/24/11
	5/4/11	4/30/11		4/28/11	4/20/11	4/20/11	4/24/11	5/1/11
	5/4/11	5/1/11		4/30/11	4/24/11	4/22/11	4/25/11	5/4/11
	4/23/11	4/13/11		5/1/11	4/25/11	4/25/11	4/25/11	5/8/11
	5/4/11			4/23/11	4/27/11	4/25/11	4/30/11	
	4/12/11			5/3/11	4/28/11	4/26/11	4/30/11	
				5/5/11			5/3/11	
							5/5/11	
				4/28-1 dead chiro				
earliest hatch date	4/12/11	4/13/11	4/22/11	4/14/11	4/14/11	4/18/11	4/16/11	4/22/11
Day of First Hatch	19	20	29	21	21	25	23	29
total number emerged-alive	10	8	5	11	9	10	12	7
Total number unemerged/dead				1	1			1
Total number of pupae	1		1					1

4/23/2011: emergence had not been recorded in consecutive order
4/12-13/2011: data recorded on daily sheets prior to the start of emergence sheets

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	1	1
4/13/2011	2	3
4/14/2011	2	5
4/15/2011	1	6
4/16/2011	3	9
4/17/2011	0	9
4/18/2011	5	14
4/19/2011	4	18
4/20/2011	6	24
4/21/2011	2	26
4/22/2011	6	32
4/23/2011	2	34
4/24/2011	4	38
4/25/2011	7	45
4/26/2011	1	46
4/27/2011	4	50
4/28/2011	3	53
4/29/2011	0	53
4/30/2011	4	57
5/1/2011	3	60
5/2/2011	0	60
5/3/2011	2	62
5/4/2011	6	68
5/5/2011	3	71
5/6/2011	0	71
5/7/2011	0	71
5/8/2011	1	72
5/9/2011	0	72
5/10/2011	0	72
5/11/2011	0	72
5/12/2011	0	72
5/13/2011	0	72

[redacted]

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891

Sample ID: CRM 2.0 Concentration: 20%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 2011

Test Day: Day 51

Date: 05/14/11 test termination

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8969

0800 X AD chemistries time/Initial

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Number Daily Renewals: ~~14th~~ 13th Nur 8/25/11

X 7:15AM AD renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes X no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations	~~AD~~ test termination 8/25/11 Nur
1	[redacted]					
2	22.4	7.72	4.0	293.7	NAV	0
3	[redacted]					
4	[redacted]					
5	[redacted]					
6	[redacted]					
7	22.2	7.73	3.9	291.8	NAV	0
8	[redacted]					
9	22.4	7.73	3.8	293.1	NAV	0
10	22.4	7.79	4.1	292.6	NAV	0
11	[redacted]					
12	[redacted]					

Hardness & Alkalinity on page 30

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.

*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0
Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891
Sample ID: CRM 2.0 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/14/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/15/11 m	4/14/11 m	4/10/11 male	4/10/11 male	4/10/11 male	4/15/11 m	4/17/11 male	4/9/11 m
2	4/20/11 F	4/15/11 m	4/19/11 m	4/17/11 male	4/15/11 F	4/24/11 died ½ emerged	4/26/11 F	4/21/11 m
3	4/15 male	4/18/11 m	4/20/11 m	4/17/11 male	4/20/11 m	4/25/11 F	4/26/11 F	4/25/11 m
4	4/10/11 male	4/22/11 F	4/21/11 m	4/19/11 m	4/22/11 F	4/26/11 F	5/3/11 F	4/29/11 m
5	4/19/11 m	4/25/11 F	4/22/11 m	4/24/11 m	4/22/11 F	4/26/11 F	5/5/11 M	4/29/11 F
6	4/20/11 m	5/5/11 F	4/23/11 M	4/24/11 m died 3/4 emerged	4/26/11 F	4/28/11 F	5/5/11 F	4/30/11 F
7	4/21/11 M	5/5/11 m	4/25/11 F	4/25/11 m	4/26/11 F	5/2/11 F	5/6/11 F	5/01/11 F
8	4/25/11 F	/	4/26/11 m	4/27/11 m	4/29/11 F	4/23/11 F	/	5/2/11 F
9	4/27/11 M	/	4/23/11 M	4/30/11 F	/	5/2/11 m	/	5/2/11 F
10	4/27/11 F	/	4/23/11 F	4/30/11 m	/	/	/	5/5/11 m
11	4/28/11 F	/	4/29/11 F	5/3/11 M	/	/	/	5/8/11 F
12	5/5/11 m	/	5/1/11 - 1 dead	5/5/11 m	/	/	/	5/11/11 F
Hatched Totals	12 E	7 E	11 E 1 U	11 E 1 U	8 E	8 E 1 U	7 E	12 E
20 Day Survival	Rep 3 - 12/12		Rep 4 - 12/12		Rep 7 - 12/12		Rep 10 - 12/12	

Hatch Date 4/23/11 Not in consecutive order.

S = Sieved no ngp.

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

m = Male
f = Female

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

9/6/11 AD
* Recorded on Daily Data sheets 4/21/11
QC'd - NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 2.0-20%							
	Replicate 1	Replicate 2	Replicate 5	Replicate 6	Replicate 7	Replicate 9	Replicate 10	Replicate 11
	4/15/11	4/14/11	4/16/11	4/16/11	4/16/11	4/15/11	4/17/11	4/19/11
	4/30/11	4/15/11	4/19/11	4/17/11	4/18/11	4/24/11	4/26/11	4/21/11
	4/15/11	4/18/11	4/20/11	4/17/11	4/20/11	4/25/11	4/26/11	4/25/11
	4/16/11	4/22/11	4/21/11	4/19/11	4/22/11	4/26/11	5/3/11	4/29/11
	4/19/11	4/25/11	4/22/11	4/24/11	4/22/11	4/26/11	5/5/11	4/29/11
	4/20/11	5/5/11	4/23/11	4/24/11	4/26/11	4/28/11	5/5/11	4/30/11
	4/21/11	5/5/11	4/25/11	4/25/11	4/26/11	5/2/11	5/6/11	5/1/11
	4/25/11		4/26/11	4/27/11	4/29/11	4/23/11		5/2/11
	4/27/11		4/23/11	4/30/11		5/2/11		5/2/11
	4/27/11		4/23/11	4/30/11				5/5/11
	4/28/11		4/29/11	5/3/11				5/8/11
	5/5/11		5/1/11	5/5/11				5/11/11
earliest hatch date	4/15/11	4/14/11	4/16/11	4/16/11	4/16/11	4/15/11	4/17/11	4/19/11
Day of First Hatch	22	21	23	23	23	22	24	26
total number emerged-alive	12	7	11	11	8	8	7	12
Total number unemerged/dead			1	1		1		
Total number of pupae								

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	4	5
4/16/2011	4	9
4/17/2011	3	12
4/18/2011	2	14
4/19/2011	4	18
4/20/2011	3	21
4/21/2011	3	24
4/22/2011	4	28
4/23/2011	4	32
4/24/2011	1	33
4/25/2011	6	39
4/26/2011	7	46
4/27/2011	3	49
4/28/2011	2	51
4/29/2011	4	55
4/30/2011	4	59
5/1/2011	1	60
5/2/2011	4	64
5/3/2011	2	66
5/4/2011	0	66
5/5/2011	7	73
5/6/2011	1	74
5/7/2011	0	74
5/8/2011	1	75
5/9/2011	0	75
5/10/2011	0	75
5/11/2011	1	76
5/12/2011	0	76
5/13/2011	0	76

TVA: 5069-03

Clinch River

QC'd by: [illegible]

Sample ID: CRM 2.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47

Date: 5/10/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8969

Number Daily Renewals: 2

☑ DS 630 renewal time/Initials ☑ DR 1900 renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1400 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			
2			NAV BHV
3			
4			
5			
6			NAV BHV
7			
8			
9	22.9	3.2	
10	22.9	4.0	
11			
12			

Test Day: Day 48

Date: 5/11/11 last termination

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8969

Number Daily Renewals: 1

☑ 640 AB renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 0830 AB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations *DO drop @ last feeding
1				
2	22.9			NAV 0 1
3				
4				
5				
6	23.1			NAV 0
7				0
8		4.3	7.87	0
9		3.9	7.80	0 BHV
10				0
11				
12				

Mur

Spec Cond

NH4= u 0.00

282.1

269.6

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

	Start	End	mL used	
Hardness	12.7	16.1	3.4	136
Alk	[illegible]	[illegible]	[illegible]	110

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0
Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891
Sample ID: CRM 2.0 Concentration: 40%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/11/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/14/11 M	4/22/11 M	4/18/11 M	4/21/11 M	4/17/11 male ½ emerged/dead	4/10/11 male	4/10/11 ~~TA~~ male	4/22/11 M
2	4/18/11 M	4/26/11 M	4/20/11 F	4/24/11 F	4/22/11 M	4/22/11 F	4/22/11 M	4/25/11 M
3	4/19/11 M	4/27/11 F	4/22/11 M	4/24/11 F	4/23/11 M	4/25/11 ~~4/25/11~~ F ~~DS 8/29/11~~	4/25/11 M	4/25/11 F
4	4/21/11 M	4/27/11 F	4/21/11 M *	4/25/11 F	4/27/11 F	4/27/11 F	4/26/11 F	4/25/11 F
5	4/21/11 F	4/28/11 F	4/24/11 M	4/25/11 F		5/01/11 F	4/27/11 F	4/26/11 F
6	4/23/11 M	4/28/11 F	4/30/11 F	5/2/11 M		5/2/11 F	4/28/11 F	4/26/11 F
7	4/23/11 M	4/29/11 F	5/01/11 F	5/3/11 M		5/5/11 F	4/29/11 F	4/30/11 F
8	4/27/11 M	4/29/11 F	5/4/11 F	4/23/11 M	5/5/11 NWS 8/25/11	~~5/5/11 TA~~	4/29/11 unknown sex	4/30/11 F
9	4/27/11 F	5/3/11 unknown	5/5/11 M			4/23/11 M	5/01/11 F	5/4/11 F
10	4/28/11 F	5/8/11 F	5/7/11 F			4/23/11 F	5/5/11 F	5/4/11 F
11						5/7/11 F	4/23/11 M	4/23/11 F
12							5/5/11 M	4/23/11 M
Hatched Totals	10E^S	10E^S	10E^S	8E^S	3E^S + 1TT HU	11E^S	12^S E	12^S E
20 Day Survival	Rep 1 - 12 /12		Rep 3 - 12 /12		Rep 4 - 11 /12		Rep 5 - 12 /12	

Hatch Date 4/23/11 not in consecutive order
nwr for SRW 8/25/11

S = Sieved no orgs

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = Male
F = Female

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
nwr 8/29/11
nwr for MLL 8/29/11
EB 9/1/11
AD 8/29/11
In Field: SRW 8/29/11 NS 8/29/11 EB 8/29/11 DR 8/29/11

QC Initials:
AS 8/26/11

nwr signed for Techs in field 9/1/11
SRW 9/1/11
NS 9/1/11
DR 9/1/11

9/6/11 AD
* Recorded on Daily Data sheet AD 9/21/11
Q.C'd - NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 2.0-40%							
	Replicate 2	Replicate 6	Replicate 7	Replicate 8	Replicate 9	Replicate 10	Replicate 11	Replicate 12
	4/14/11	4/22/11	4/18/11	4/21/11	4/17/11	4/16/11	4/16/11	4/22/11
	4/18/11	4/26/11	4/20/11	4/24/11	4/22/11	4/22/11	4/22/11	4/25/11
	4/19/11	4/27/11	4/22/11	4/24/11	4/23/11	4/25/11	4/25/11	4/25/11
	4/21/11	4/27/11	4/21/11	4/25/11	4/27/11	4/27/11	4/26/11	4/25/11
	4/21/11	4/28/11	4/24/11	4/25/11		5/1/11	4/27/11	4/26/11
	4/23/11	4/28/11	4/30/11	5/2/11		5/2/11	4/28/11	4/26/11
	4/23/11	4/29/11	5/1/11	5/3/11		5/5/11	4/29/11	4/30/11
	4/27/11	4/29/11	5/4/11	4/23/11		5/5/11	4/29/11	4/30/11
	4/27/11	5/3/11	5/5/11			4/23/11	5/1/11	5/4/11
	4/28/11	5/8/11	5/7/11			4/23/11	5/5/11	5/4/11
						5/7/11	4/23/11	4/23/11
							5/5/11	4/23/11
earliest hatch date	4/14/11	4/22/11	4/18/11	4/21/11	4/22/11	4/16/11	4/16/11	4/22/11
Day of First Hatch	21	29	25	28	29	23	23	29
total number emerged-alive	10	10	10	8	3	11	12	12
Total number unemerged/dead					1			
Total number of pupae					1			

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/18/11	26	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	0	1
4/16/2011	2	3
4/17/2011	0	3
4/18/2011	2	5
4/19/2011	1	6
4/20/2011	1	7
4/21/2011	4	11
4/22/2011	6	17
4/23/2011	9	26
4/24/2011	3	29
4/25/2011	7	36
4/26/2011	4	40
4/27/2011	7	47
4/28/2011	4	51
4/29/2011	4	55
4/30/2011	3	58
5/1/2011	3	61
5/2/2011	2	63
5/3/2011	2	65
5/4/2011	3	68
5/5/2011	5	73
5/6/2011	0	73
5/7/2011	2	75
5/8/2011	1	76
5/9/2011	0	76
5/10/2011	0	76
5/11/2011	0	76
5/12/2011	0	76
5/13/2011	0	76

QC'd by: Nur

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891

Sample ID: CRM 2.0 Concentration: 60%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 2011

Test Day: Day 16

Date: 5/9/11 test termination

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

☒ 1200 Nur chemistries time/Initial

Test Photoperiod: 16:8

Test System: 175mL Manual Delivery

Test Temperature: 23± 1°C

Test Organism Source/Age: ABS < 24 hours

Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Number Daily Renewals: 1

☒ 1015 EB renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations *@ Nur test termination
1	/	/	/	/	/
2					2 purpae
3					2 purpae
4					
5	22.9	7.45	4.0	279.9	0
6					0
7					2 purpae
8					0
9					
10	23.0	7.57	3.7	277.2	1 purpae
11					
12					

Start	End	mL used	Hardness
11.3	14.8	3.5	140

Start	End	mL Used	Alkalinity
7.9	13.5	5.6	112

NH4= 0.01u

EB

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0
Concentration: 60%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891
Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 60%
Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*
Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011
Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/9/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)
1 DS 8/29/11	4/18/11 ~~4/15/11~~ M	4/19/11 M	4/20/11 M	4/14/11 M	4/23/11 M	4/17/11 male	4/16/11 male	4/16/11 male
2	4/18/11 M	4/22/11 F	4/22/11 M	4/17/11 male	4/24/11 F	4/20/11 M	4/18/11 male	4/21/11 M
3	4/19/11 M	4/22/11 M	4/22/11 F	4/20/11 M	Died as emerging 4/24/11	4/21/11 M	4/19/11 M	4/20/11 F *
4	4/19/11 M	4/24/11 M	4/26/11 F	4/20/11 F	Died as emerging 4/24/11	4/21/11 F	4/19/11 M	4/24/11 M
5	4/24/11 M (24 NWW for SRW 8/25/11)	4/28/11 F	4/26/11 F	4/21/11 F	4/25/11 F	5/5/11 M	4/24/11 F	4/24/11 F
6	4/24/11 F	5/5/11 M	4/30/11 F	4/21/11 M	4/25/11 F	/	4/25/11 M	4/26/11 F
7	4/25/11 M	/	5/2/11 F	4/24/11 F	4/27/11 M	/	4/23/11 F	5/05/11 F
8	4/26/11 F	/	5/3/11 F	4/28/11 M	/	/	4/23/11 F	5/06/11 F
9	4/26/11 F	/	/	/	/	4/23/11 M	4/25/11 F	/
10	4/27/11 M	/	/	/	/	4/23/11 F	4/25/11 F	/
11	4/28/11 F	/	/	/	/	4/23/11 F	4/27/11 F	/
12	5/01/11 F	3 dead chiro. 5/2	M	4/27/11 M	~~4/27/11 M~~ (8) NWW for SRW 8/05/11	/	/	/
Hatched Totals	12 E	6 ES + 2TT + 3U	8 ES + 2TT	9 ES	5 ES + 2U	8 ES + 2TT	11 ES	8 ES + 1TT

20 Day Survival	Rep 4 - 9+1p/12	Rep 9 - 12/12	Rep 11 - 12/12	Rep 12 - 12/12

Hatch Date 4/23/11 not in consecutive order
NWW for SRW 8/25/11

S = sieved no Stop

M = Male
F = Female

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

Tech Initials:
AB 8/26/11
DS 8/29/11
MLL 8/29/11
NWW 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

NWW signed for Tech in field 9/7/11
SRW 9/1/11
NS 9/1/11
DR 9/1/11

AD 9/6/11
* Recorded on Daily Data Sheet 4/21/11 AD
QC'd NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 2.0-60%							
	Replicate 1	Replicate 2	Replicate 3	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 10
	4/18/11	4/19/11	4/20/11	4/14/11	4/23/11	4/17/11	4/16/11	4/16/11
	4/18/11	4/22/11	4/22/11	4/17/11	4/24/11	4/20/11	4/18/11	4/21/11
	4/19/11	4/22/11	4/22/11	4/20/11	4/24/11	4/21/11	4/19/11	4/20/11
	4/19/11	4/24/11	4/26/11	4/20/11	4/24/11	4/21/11	4/19/11	4/24/11
	4/24/11	4/28/11	4/26/11	4/21/11	4/25/11	5/5/11	4/24/11	4/24/11
	4/24/11	5/5/11	4/30/11	4/21/11	4/25/11	4/23/11	4/25/11	4/26/11
	4/25/11		5/2/11	4/24/11	4/27/11	4/23/11	4/23/11	5/1/11
	4/26/11		5/3/11	4/28/11		4/23/11	4/23/11	5/6/11
	4/26/11			4/23/11			4/25/11	
	4/27/11						4/25/11	
	4/28/11						4/27/11	
	5/1/11	5/2-3 dead chiro						
earliest hatch date	4/18/11	4/19/11	4/20/11	4/14/11	4/23/11	4/17/11	4/16/11	4/16/11
Day of First Hatch	25	26	27	21	30	24	23	23
total number emerged-alive	12	6	8	9	5	8	11	8
Total number unemerged/dead					2			
Total number of pupae		2	2			2		1
Dead larvae and pupae		3						

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	25	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	0	1
4/16/2011	2	3
4/17/2011	2	5
4/18/2011	3	8
4/19/2011	5	13
4/20/2011	5	18
4/21/2011	5	23
4/22/2011	4	27
4/23/2011	7	34
4/24/2011	8	42
4/25/2011	6	48
4/26/2011	5	53
4/27/2011	3	56
4/28/2011	3	59
4/29/2011	0	59
4/30/2011	1	60
5/1/2011	2	62
5/2/2011	1	63
5/3/2011	1	64
5/4/2011	0	64
5/5/2011	2	66
5/6/2011	1	67
5/7/2011	0	67
5/8/2011	0	67
5/9/2011	0	67
5/10/2011	0	67
5/11/2011	0	67
5/12/2011	0	67
5/13/2011	0	67

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0

QC'd by: [illegible] Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891	Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 49
Date: 5/12/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969
Number Daily Renewals: 1
☑ 640 ED renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a
☒ 1200 [illegible] chemistries time/Initial

Hardness
Start: 27.2
End: 30.5
mL Used: 3.3
132

Alkalinity
Start: 32.2
End: 37.7
mL Used: 5.5
110

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations	pH	Cond
1					
2					
3			NAV BHV	0	
4					
5					
6	~~23.1~~	4.5 8/25/11	NAV BHV	0	7.54 276.9
7	23.1			1 pupa	
8	8/25/11 [illegible]			0	
9	[illegible]			0	
10	23.1 ~~7.69~~	4.0		0	7.69 277.4
11	8/25/11		BHV	1 pupa	
12					

* 10 reps lost this day [illegible]

NH4= 0.04 J (BB)

Test Day: Day 50
Date: 5/13/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number):
Number Daily Renewals:
☐ renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☐ n/a
☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0
Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891
Test Photoperiod: 16:8
Sample ID: CRM 2.0 Concentration: 80%
Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*
Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011
Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/12/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)
1	4/20/11 M	4/22/11 M	4/18/11 M	4/14/11 Unknown F 9/7/11	4/16/11 male	4/13/11 DS 8/29/11 ~~4/13/11~~ M	4/17/11 male	4/17/11 male
2	4/21/11 M	4/25/11 M	4/20/11 M	4/20/11 M	4/18/11 M	4/17/11 male	4/17/11 male	4/18/11 F
3	4/22/11 M	4/26/11 M	4/20/11 M	4/25/11 M	4/18/11 M	4/18/11 M	4/18/11 M	4/22/11 F
4	4/22/11 M	4/27/11 M	4/21/11 F*	4/27/11 F	4/20/11 M	4/18/11 M	4/18/11 M	4/25/11 F
5	4/26/11 F	4/27/11 F	4/20/11 M*	4/28/11 F	4/24/11 F	4/20/11 F	4/24/11 M dead on 4/20	4/26/11 F
6	4/23/11 M	4/30/11 F	4/26/11 F	4/29/11 M	4/30/11 M	4/25/11 F	4/26/11 M	5/01/11 F
7	4/23/11 ?	4/30/11 F	4/29/11 F	4/30/11 F		4/26/11 F	4/26/11 F	
8	5/01/11 F	4/23/11 M	4/29/11 F	5/01/11 F		4/30/11 F	4/29/11 F	
9	5/01/11 F		4/29/11 F	5/2/11 F		4/23/11 F	4/29/11 F	
10	5/2/11 F			5/9/11 F		5/2/11 F	4/30/11 F	
11	5/3/11 F							
12	5/5/11 M							
Hatched Totals	12 ^{S}E	8 E^{S}	9E^{S}	10E^{S} + 1TT	6E^{S}	10E^{S}	9E^{S} + 1U	6E^{S} + 1TT
20 Day Survival	Rep 1 - 12/12		Rep 4 - 11/12		Rep 5 - 12/12		Rep 12 - 12/12	

Hatch Date 4/23/11 not in consecutive order
Nwb for SRW 8/25/11

S=Sexed no ovp

M=MALE
F=Female

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
Nwb 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

Nwb Signed for Tech in Field 9/7/11
SRW 9/1/11
NS 9/1/11
OR 9/1/11

9/6/11 AD
* Recorded on Daily Data Sheet AD 4/21/11
QC'd - NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 2.0-80%							
	Replicate 2	Replicate 3	Replicate 6	Replicate 7	Replicate 8	Replicate 9	Replicate 10	Replicate 11
	4/20/11	4/22/11	4/18/11	4/14/11	4/16/11	4/13/11	4/17/11	4/17/11
	4/21/11	4/25/11	4/20/11	4/20/11	4/18/11	4/17/11	4/17/11	4/18/11
	4/22/11	4/26/11	4/20/11	4/25/11	4/18/11	4/18/11	4/18/11	4/22/11
	4/22/11	4/27/11	4/21/11	4/27/11	4/22/11	4/18/11	4/18/11	4/25/11
	4/26/11	4/27/11	4/20/11	4/28/11	4/24/11	4/20/11	4/24/11	4/26/11
	4/23/11	4/30/11	4/26/11	4/29/11	4/30/11	4/25/11	4/26/11	5/1/11
	4/23/11	4/30/11	4/29/11	4/30/11		4/26/11	4/26/11	
	5/1/11	4/23/11	4/29/11	5/1/11		4/30/11	4/29/11	
	5/1/11		4/29/11	5/2/11		4/23/11	4/29/11	
	5/2/11			5/9/11		5/2/11	4/30/11	
	5/3/11							
	5/5/11							
earliest hatch date	4/20/11	4/22/11	4/18/11	4/14/11	4/16/11	4/13/11	4/17/11	4/17/11
Day of First Hatch	27	29	25	21	23	20	24	24
total number emerged-alive	12	8	9	10	6	10	9	6
Total number unemerged/dead							1	
Total number of pupae				1				1

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	1	1
4/14/2011	1	2
4/15/2011	0	2
4/16/2011	1	3
4/17/2011	4	7
4/18/2011	8	15
4/19/2011	0	15
4/20/2011	6	21
4/21/2011	2	23
4/22/2011	5	28
4/23/2011	4	32
4/24/2011	1	33
4/25/2011	4	37
4/26/2011	7	44
4/27/2011	3	47
4/28/2011	1	48
4/29/2011	6	54
4/30/2011	6	60
5/1/2011	4	64
5/2/2011	3	67
5/3/2011	1	68
5/4/2011	0	68
5/5/2011	1	69
5/6/2011	0	69
5/7/2011	0	69
5/8/2011	0	69
5/9/2011	1	70
5/10/2011	0	70
5/11/2011	0	70
5/12/2011	0	70
5/13/2011	0	70

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891

Sample ID: CRM 2.0 Concentration: 100%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 46

Date: 5/9/11 dest dermuratin

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

Number Daily Renewals: 1

☒ 615 LB renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ [illegible] 1030 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations ☒ @ dest dermuratin [illegible]
1	23.0	7.61	4.0	277.2	0
2					0
3					
4					0
5					
6					
7	23.0	7.58	3.7	274.1	0
8					0
9					0
10					
11					0
12					0

Hardness Start	End	mL Used	Hardness
~~0.8~~ 8/24/11 8.0	11.3	3.3	132

Alkalinity			Alk.
2.4	7.9	5.5	110

NH4= 0.00 U (23)

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 2.0

Concentration: 100%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8891

Test Photoperiod: 16:8

Sample ID: CRM 2.0 Concentration: 100%

Test System: 175mL Manual Delivery

Test Species: *Chironomus dilutus*

Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011

Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Hatched Individual	Replicate ~~1~~ 1 (Hatch Date/Sex) MWS 8/25/11	Replicate ~~4~~ 2 (Hatch Date/Sex) MWS 8/25/11	Replicate ~~7~~ 4 (Hatch Date/Sex) MWS 8/25/11	Replicate ~~8~~ 7 (Hatch Date/Sex) MWS 8/25/11	Replicate 8 (Hatch Date/Sex)	Replicate ~~8~~ 9 (Hatch Date/Sex) MWS 8/25/11	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/21/11 M	4/15/11 m	4/19/11 M	4/20/11 M	4/14/11 m	4/19/11 M	4/19/11 M	4/24/11 F
2	4/22/11 M	4/20/11 M	4/20/11 F	4/20/11 M	4/15/11 m	4/22/11 M	4/26/11 F	4/25/11 F
3	4/22/11 m	4/24/11 M	4/21/11 M	4/27/11 M	4/16/11 male	4/22 F	4/27/11 M	4/25/11 F
4	4/20/11 m *	4/25/11 F	4/21/11 M	4/27/11 F	4/17/11 female	4/25/11 M	4/27/11 M	4/27/11 F
5	4/25/11 M	4/26/11 F	4/21/11 m *	4/28/11 F	4/19/11 M	DS 8/29/11 ~~4/25/11~~ F 4/25/11	4/27/11 M	4/30/11 M
6	4/27/11 F	4/28/11 F	4/21/11 m *	4/29/11 M	4/22/11 m	4/26/11 F	4/29/11 F	5/01/11 F
7	4/27/11 F	4/29/11 F	4/25/11 M	4/29/11 F	4/26/11 F	4/27/11 M	5/2/11 F	5/3/11 unknown
8	4/27/11 F	5/3/11 F	4/25/11 F	5/01/11 M		4/28/11 F	5/2/11 F	5/4/11 F
9	4/28/11 F		5/6/11 M	5/01/11 F			5/4/11 DS 9/6/11 ~~5/6/11~~ F	
10	5/01/11 F			5/5/11 F			5/5/11 F	
11							5/5/11 F	
12								
Hatched Totals	10 ES	8 ES	9 ES	10 ES 8/25/11	7 ES	8 ES	11 ES	8 ES
20 Day Survival	Rep 3 - 8+1p /12	Rep 5 - 11 /12	Rep 6 - 10+1p /12	Rep 10 - 12 /12				

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
MWS 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

Name signed for Techs in field 9/7/11
SMW 9/1/11
NS 9/1/11
DR 9/1/11

1 9/6/11 HO

* Recorded on Daily Data sheet. NS 4/21/11
a.c.d - NS

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 2.0-100%							
	Replicate 1	Replicate 2	Replicate 4	Replicate 7	Replicate 8	Replicate 9	Replicate 11	Replicate 12
	4/21/11	4/15/11	4/19/11	4/20/11	4/14/11	4/19/11	4/19/11	4/24/11
	4/22/11	4/20/11	4/20/11	4/20/11	4/15/11	4/22/11	4/26/11	4/25/11
	4/22/11	4/24/11	4/21/11	4/27/11	4/16/11	4/22/11	4/27/11	4/25/11
	4/20/11	4/25/11	4/21/11	4/27/11	4/17/11	4/25/11	4/27/11	4/27/11
	4/25/11	4/26/11	4/21/11	4/28/11	4/19/11	4/25/11	4/27/11	4/30/11
	4/27/11	4/28/11	4/21/11	4/29/11	4/22/11	4/26/11	4/29/11	5/1/11
	4/27/11	4/29/11	4/25/11	4/29/11	4/26/11	4/27/11	5/2/11	5/3/11
	4/27/11	5/3/11	4/25/11	5/1/11		4/28/11	5/2/11	5/4/11
	4/28/11		5/6/11	5/1/11			5/4/11	
	5/1/11			5/5/11			5/5/11	
							5/5/11	
earliest hatch date	4/20/11	4/15/11	4/19/11	4/20/11	4/14/11	4/19/11	4/19/11	4/24/11
Day of First Hatch	27	22	26	27	21	26	26	31
total number emerged-alive	10	8	9	10	7	8	11	8
Total number unemerged/dead								
Total number of pupae								

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/18/11	26	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 2.0-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	2	3
4/16/2011	1	4
4/17/2011	1	5
4/18/2011	0	5
4/19/2011	4	9
4/20/2011	5	14
4/21/2011	5	19
4/22/2011	5	24
4/23/2011	0	24
4/24/2011	2	26
4/25/2011	8	34
4/26/2011	4	38
4/27/2011	10	48
4/28/2011	4	52
4/29/2011	4	56
4/30/2011	1	57
5/1/2011	4	61
5/2/2011	2	63
5/3/2011	2	65
5/4/2011	2	67
5/5/2011	3	70
5/6/2011	1	71
5/7/2011	0	71
5/8/2011	0	71
5/9/2011	0	71
5/10/2011	0	71
5/11/2011	0	71
5/12/2011	0	71
5/13/2011	0	71

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0

QC'd by: [illegible] Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893

Sample ID: CRM 3.0 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47

Date: 5/10/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 3969

Number Daily Renewals:

DO 6:40 renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Hardness (140) end: 15.1 Start: 11.6 used: 3.5

Alkalinity (110) end: 43.9 Start: 38.4 used: 5.5

chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations pH	SC	*@ start termination
1					
2	22.7	4.0	7.62	284.0	0
3					
4					2 pupae
5					0
6					0 pu
7					1 pupae
8					2 pupae
9					
10					
11	22.7	3.9	7.60	276.2	1 pupae
12					0

NH4= 0.02 u

Test Day: Day 48

Date: 5/11/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number):

Number Daily Renewals:

☐ renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0

Concentration: 10%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893

Sample ID: CRM 3.0 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/10/11

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
MW 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

MW signed for 9/1/11
Techs in field
SRW 9/1/11
DR 9/1/11
NS 9/1/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/15/11 M	~~4/15/11~~ 4/15/11 M DS 8/29/11	4/17/11 F	4/14/11 M	4/18/11 F	4/18/11 M	4/15/11 M	4/14/11 M
2	4/15/11 M	4/26/11 M	4/20/11 F	4/20/11 F	4/20/11 F	4/22/11 M	4/16/11 M	4/14/11 M
3	4/15/11 M	4/29/11 F	4/20/11 M	4/24/11 F	4/22/11 M	4/22/11 M	4/19/11 M	4/15/11 M
4	4/16/11 M	4/29/11 M	4/21/11 M	4/25/11 F	4/22/11 M	4/24/11 M	4/22/11 F	4/20/11 F
5	4/19/11 M	4/30/11 M	4/21/11 M *	4/28/11 M	4/29/11 M	4/27/11 M	4/25/11 F	4/21/11 M
6	4/22/11 M	5/2/11 F	4/24/11 M	5/2/11 M	5/2/11 F	4/29/11 M	4/26/11 F	4/28/11 F
7	4/20/11 M *	5/5/11 F	4/24/11 M			4/30/11 F	4/27/11 F	
8	4/28/11 M	5/6/11 F	4/24/11 M		4/23/11 M	5/4/11 M	5/4/11 M	
9	5/2/11 M		4/25/11 F		4/23/11 M	5/4/11 F		
10	5/2/11 F					5/5/11 F	4/23/11 M	
11						5/7/11 F	4/23/11 F	
12								
Hatched Totals	10ES	8ES+2TT	9ES	6ES	8ES+1TT	11ES	10ES+1TT	6ES
20 Day Survival	Rep 1 - 12/12		Rep 3 - 12/12		Rep 9 - 5+2p/12		Rep 10 - 8+1p/12	

Hatch Date 4/23/11 not in consecutive order
MW for SRW 8/25/11

9/6/11 MD
* Recorded on Daily Data sheet MD 4/21/11
QC-d-NS

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female
P = pupae

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 3.0-10%							
	Replicate 2	Replicate 4	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 11	Replicate 12
	4/15/11	4/15/11	4/17/11	4/14/11	4/18/11	4/18/11	4/15/11	4/14/11
	4/15/11	4/26/11	4/20/11	4/20/11	4/20/11	4/22/11	4/16/11	4/14/11
	4/15/11	4/29/11	4/20/11	4/24/11	4/22/11	4/22/11	4/19/11	4/15/11
	4/16/11	4/29/11	4/21/11	4/25/11	4/22/11	4/24/11	4/22/11	4/20/11
	4/19/11	4/30/11	4/21/11	4/28/11	4/29/11	4/27/11	4/25/11	4/21/11
	4/22/11	5/2/11	4/24/11	5/2/11	5/2/11	4/29/11	4/26/11	4/28/11
	4/20/11	5/5/11	4/24/11		4/23/11	4/30/11	4/27/11	
	4/28/11	5/6/11	4/24/11		4/23/11	5/4/11	5/4/11	
	5/2/11		4/25/11			5/4/11	4/23/11	
	5/2/11					5/5/11	4/23/11	
						5/7/11		
earliest hatch date	4/15/11	4/15/11	4/17/11	4/14/11	4/18/11	4/18/11	4/15/11	4/14/11
Day of First Hatch	22	22	24	21	23	25	22	21
total number emerged-alive	10	8	9	6	8	11	10	6
Total number unemerged/dead								
Total number of pupae		2			1		1	

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/15/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	3	3
4/15/2011	6	9
4/16/2011	2	11
4/17/2011	1	12
4/18/2011	2	14
4/19/2011	2	16
4/20/2011	6	22
4/21/2011	3	25
4/22/2011	6	31
4/23/2011	4	35
4/24/2011	5	40
4/25/2011	3	43
4/26/2011	2	45
4/27/2011	2	47
4/28/2011	3	50
4/29/2011	4	54
4/30/2011	2	56
5/1/2011	0	56
5/2/2011	5	61
5/3/2011	0	61
5/4/2011	3	64
5/5/2011	2	66
5/6/2011	1	67
5/7/2011	1	68
5/8/2011	0	68
5/9/2011	0	68
5/10/2011	0	68
5/11/2011	0	68
5/12/2011	0	68
5/13/2011	0	68

TVA: 5069-03

Clinch River

QC'd by Nick

Sample ID: CRM 3.0

Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893

Sample ID: CRM 3.0 Concentration: 20%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 49

Date: 5/12/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8969

Number Daily Renewals: 1

☑ 640 renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

X 1100 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations		pH	SC
1						
2	23.1	4.0	NAV	2 pupae	7.66	279.7
3				1 pupae		
4				0		
5						
6			NAV	0		
7				1 pupae		
8				0		
9	23.1	3.7		0	7.71	281.1
10						
11			NAV	1 pupae		
12						

Hardness
Start: 23.8
End: 27.2
mL used: 3.4
136

Alkalinity
Start: 26.7
End: 32.2
mL used: 5.5
110

NH4= 0.14 (B3)

Test Day: Day 50

Date: 5/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number):

Number Daily Renewals:

☐ renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0
Concentration: 20%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893
Sample ID: CRM 3.0 Concentration: 20%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/12/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)
1	4/18/11 M	4/17/11 M	4/18/11 M	4/15/11 F	4/15/11 M	4/16/11 M	4/14/11 M	4/14/11 M
2	4/18/11 F	4/25/11 F	4/19/11 M	4/22/11 M	4/18/11 M	4/19/11 M	4/19/11 F	4/16/11 M
3	4/20/11 F	4/28/11 F	4/21/11 M	4/22/11 F	4/19/11 M	4/24/11 M	4/19/11 F	4/20/11 M
4	5/2/11 F	4/30/11 M	4/22/11 F	4/25/11 F	4/21/11 F	4/26/11 F	4/20/11 F	4/22/11 M
5	5/3/11 M	4/30/11 F	4/22/11 F	4/23/11 M 8/25/11	4/24/11 F	4/29/11 F	4/24/11 F	4/24/11 F
6	5/4/11 F	4/30/11 F	4/22/11 M 8/25/11	4/30/11 M	5/2/11 M	4/30/11 M	5/2/11 M	5/2/11 M
7	5/5/11 M	5/3/11 F	4/25/11 M	5/4/11 F	5/4/11 M	5/7/11 F	4/23/11 F	4/23/11 F
8		5/4/11 F	4/25/11 ~~4/25/11~~ M			5/9/11 F	4/23/11 M	4/23/11 F
9			DS 8/29/11 4/29/11 F					5/4/11 M
10			4/29/11 F					
11								
12								
Hatched Totals	7E + 2TT	8E + 1TT	10E	7E	7E 1TT	8E	8E	9E + 1TT

20 Day Survival	Rep 1 - 6+2/12	Rep 5 - 5+2/12	Rep 10 - 11 /12	Rep 12 - 9+1/12

Hatch Date 4/23/11 Not in Consecutive Order
Nuw for SRW 8/25/11

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = Male
F = Female

Tech Initials:
AB 8/26/11
DS 8/29/11
MLL 8/29/11
Nuw 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

Nuw signed for 9/7/11 Techs in field
SRW 9/1/11
NS 9/1/11
DR 9/1/11

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 3.0-20%							
	Replicate 2	Replicate 3	Replicate 4	Replicate 6	Replicate 7	Replicate 8	Replicate 9	Replicate 11
	4/18/11	4/17/11	4/18/11	4/15/11	4/15/11	4/16/11	4/14/11	4/14/11
	4/18/11	4/25/11	4/19/11	4/22/11	4/18/11	4/19/11	4/19/11	4/16/11
	4/20/11	4/28/11	4/21/11	4/22/11	4/19/11	4/24/11	4/19/11	4/20/11
	5/2/11	4/30/11	4/22/11	4/25/11	4/21/11	4/26/11	4/20/11	4/22/11
	5/3/11	4/30/11	4/22/11	4/28/11	4/24/11	4/29/11	4/24/11	4/24/11
	5/4/11	4/30/11	4/22/11	4/30/11	5/2/11	4/30/11	5/2/11	5/2/11
	5/5/11	5/3/11	4/25/11	5/4/11	5/4/11	5/7/11	4/23/11	4/23/11
		5/4/11	4/25/11			5/9/11	4/23/11	4/23/11
			4/29/11					5/4/11
			4/29/11					
earliest hatch date	4/18/11	4/17/11	4/18/11	4/15/11	4/15/11	4/16/11	4/14/11	4/14/11
Day of First Hatch	25	24	25	22	22	23	21	21
total number emerged-alive	7	8	10	7	7	8	8	9
Total number unemerged/dead								
Total number of pupae	2	1			1			1

4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/15/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	2	2
4/15/2011	2	4
4/16/2011	2	6
4/17/2011	1	7
4/18/2011	4	11
4/19/2011	5	16
4/20/2011	3	19
4/21/2011	2	21
4/22/2011	6	27
4/23/2011	4	31
4/24/2011	4	35
4/25/2011	4	39
4/26/2011	1	40
4/27/2011	0	40
4/28/2011	2	42
4/29/2011	3	45
4/30/2011	5	50
5/1/2011	0	50
5/2/2011	4	54
5/3/2011	2	56
5/4/2011	5	61
5/5/2011	1	62
5/6/2011	0	62
5/7/2011	1	63
5/8/2011	0	63
5/9/2011	1	64
5/10/2011	0	64
5/11/2011	0	64
5/12/2011	0	64
5/13/2011	0	64

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893

Sample ID: CRM 3.0 Concentration: 40%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 46

Date: 5/9/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

Number Daily Renewals: 1

☒ 1415 DS renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1415 ab chemistries time/Initial

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations *@ start termination only
1	23.1	7.59	3.7	278.2	1 pupae 1 FOV
2					0
3					0
4	23.1	7.64	3.9	277.7	2 pupae
5					
6					0
7					0
8					1 pupae
9					
10					
11					
12					2 pupae

Start	End	mL Used	Hardness
32.1	35.2	3.1	124

Start	End	mL Used	Alkalinity
41.5	46.0	4.5	90

NH4 = 0.02 u
EB

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0

Concentration: 40%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893

Sample ID: CRM 3.0 Concentration: 40%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/9/11 DS 8/29/11

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
NWV 8/29/11
AD 8/29/11
EB 9/1/11
QC Initials:
AS 8/26/11

NWV Signed for 9/1/11
Techs in Bold
SRW 9/1/11
NS 9/1/11
DR 9/1/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/19/11 M	4/14/11 m	4/14/11 m	* 4/16/11 ~~2~~ M AS 8/26/11	4/15/11 m	4/14/11 m	4/18/11 m	4/18/11 m
2	4/24/11 M	4/14/11 m	4/16/11 M	4/19/11 F	4/17/11 M	4/15/11 M	4/19/11 m	4/20/11 m
3	4/24/11 F	4/17/11 M	4/17/11 m	* 4/16/11 M	4/18/11 M	4/15/11 M	4/22/11 F	4/20/11 unknown sex * AS 8/26/11
4	4/25/11 F	~~4/20/11~~ 4/20/11 DS 8/29/11 M	4/20/11 F	4/26/11 F	4/19/11 F	4/19/11 M	4/24/11 F	4/26/11 m
5	4/27/11 M	4/21/11 F	4/21/11 F	4/27/11 M	4/22/11 m	4/21/11 F	4/27/11 F	4/27/11 F
6	4/27/11 F	4/24/11 F	4/25/11 M	5/01/11 F	4/30/11 F	4/23/11 F	4/28/11 m	4/23/11 M
7	4/27/11 F	4/29/11 F	4/26/11 F	4/23/11 F	5/01/11 F		4/30/11 F	~~4/28/11~~ 4/28/11 f NWV 8/25/11
8	5/01/11 M	4/29/11 F	4/23/11 F	5/01/11 F	5/2/11 F		5/01/11 m	4/29/11 F
9		4/25/11 F	4/23/11 F	5/2/11 F			5/3/11 F	5/5/11 F
10		5/6/11 F						
11		5/6/11 F						
12						2 chironomids ~~4/25~~ 4/25 lead-notation data sheets	NWV for NS 8/25/11	
Hatched Totals	8E^S+1TT	11E^S	9E^S	9E^S+2TT	8E^S	6E^S+2U	9E^S+1TT	9E^S+2TT
20 Day Survival	Rep 5 - 8+1p /12		Rep 9 - 11 /12		Rep 10 - 12 /12		Rep 11 - 12 /12	

Hatch Date 4/23/11 Not in consecutive order NWV for SRW 8/25/11

* used 1 row instead of 2 separate rows; corrected below AS 8/26/11

9/6/11 AD

* Recorded on Daily Data Sheet 4/21/11 QC'd - NS

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 3.0-40%							
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 6	Replicate 7	Replicate 8	Replicate 12
	4/19/11	4/14/11	4/14/11	4/16/11	4/15/11	4/14/11	4/15/11	4/18/11
	4/24/11	4/14/11	4/16/11	4/19/11	4/17/11	4/15/11	4/19/11	4/22/11
	4/24/11	4/17/11	4/17/11	4/16/11	4/18/11	4/15/11	4/22/11	4/20/11
	4/25/11	4/20/11	4/20/11	4/26/11	4/19/11	4/19/11	4/24/11	4/26/11
	4/27/11	4/21/11	4/21/11	4/27/11	4/22/11	4/21/11	4/27/11	4/27/11
	4/27/11	4/24/11	4/25/11	5/1/11	4/30/11	4/23/11	4/28/11	4/23/11
	4/27/11	4/25/11	4/26/11	4/23/11	5/1/11		4/30/11	4/28/11
	5/1/11	4/25/11	4/23/11	5/1/11	5/2/11		5/1/11	4/29/11
		4/25/11	4/23/11	5/2/11			5/3/11	5/5/11
		5/5/11						
		5/6/11						
						4/25-2 dead chiro		
earliest hatch date	4/19/11	4/14/11	4/14/11	4/16/11	4/15/11	4/14/11	4/15/11	4/18/11
Day of First Hatch	26	21	21	23	22	21	22	25
total number emerged-alive	8	11	9	9	8	6	9	9
Total number unemerged/dead								
Total number of pupae	1			2			1	2
Dead larvae and pupae						2		

4/16/2011; two emergence recorded on same day
4/23/2011: emergence had not been recorded in consecutive order

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/15/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	4	4
4/15/2011	4	8
4/16/2011	3	11
4/17/2011	3	14
4/18/2011	2	16
4/19/2011	5	21
4/20/2011	3	24
4/21/2011	3	27
4/22/2011	3	30
4/23/2011	5	35
4/24/2011	4	39
4/25/2011	5	44
4/26/2011	3	47
4/27/2011	6	53
4/28/2011	2	55
4/29/2011	1	56
4/30/2011	2	58
5/1/2011	5	63
5/2/2011	2	65
5/3/2011	1	66
5/4/2011	0	66
5/5/2011	2	68
5/6/2011	1	69
5/7/2011	0	69
5/8/2011	0	69
5/9/2011	0	69
5/10/2011	0	69
5/11/2011	0	69
5/12/2011	0	69
5/13/2011	0	69

TVA: 5069-03

Clinch River

QC'd by: Nur

Sample ID: CRM 3.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47
Date: 5/10/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 0969
Number Daily Renewals:
DOS 6:40 renewal time/Initials ☐ ✓ renewal time/Initials
☐ ✓ renewal time/Initials ☐ ✓ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# ✓ ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☒ no ☐ n/a

Hardness (137)
end: 18.4
start: 15.1
used: 3.3
Alkalinity: (108)
end: 9.8
start: 4.4
used: 5.4

✓ EB 1000 chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations pH	SC	# of test termination Nur
1					0
2	22.7	4.0	7.69	277.1	pupae
3					
4					
5					0
6					pupae
7					pupae
8					
9					
10					
11	22.7	4.0	7.60	279.9	0
12			Nur 8/24		0

NH4= 0.05 J

Test Day: Day 48
Date: 5/11/11
Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number):
Number Daily Renewals:
☐ renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0
Concentration: 60%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893
Sample ID: CRM 3.0 Concentration: 60%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/10/11

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
MW 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/14/11 m	4/14/11 m	4/15/11 m	4/22/11 m	4/19/11 M	4/14/11 m	4/18/11 F	4/15/11 m
2	4/14/11 m	4/14/11 m	4/20/11 F	4/22/11 m	4/20/11 F	4/17/11 M	4/18/11 F	4/17/11 m
3	4/18/11 m	4/17/11 M	4/22/11 m	4/26/11 F	4/23/11 F	4/19/11 m	4/22/11 F	4/17/11 m
4	4/18/11 m	4/18/11 m	4/22/11 F	4/27/11 M	4/25/11 F	4/19/11 M	4/21/11 m *	4/19/11 M
5	4/20/11 M	4/20/11 M	4/23/11 M	4/28/11 F	4/29/11 F	4/23/11 F	4/23/11 F	4/20/11 m
6	4/23/11 M	5/2/11 F	4/24/11 F	~~4/26/11~~ 5/4/11 F MW 5/10/11	5/2/11 F	4/26/11 f	4/26/11 M	4/24/11 M
7	4/26/11 F	5/2/11 F	4/29/11 F	5/7/11 F	*1 Died in emerg 5/4/11 F	4/28/11 f	4/26/11 m	4/24/11 M
8	4/28/11 F	5/13/11 F	4/25/11 F			4/30/11 F		4/24/11 F
9			4/29/11 F			4/30/11 f		4/25/11 F
10						4/30/11 F		4/27/11 M
11						5/2/11 f		4/27/11 F
12						5/2/11 *1 died in emergence		

Hatched Totals	8E^S+	8E^S+ 1TT	9E^S	7E^S+ 1TT	6E^S+1TT+1U	MW 8/25/11 ~~12~~ 8 11E^S+1U	7E^S	11E^S

20 Day Survival	Rep 3 - 8+1/12	Rep 4 - 10/12	Rep 9 - 11/12	Rep 10 - 12/12

Tech Initials:
MW signed for 9/1/11
Techs in field
NS 9/1/11
SAW 9/1/11
DR 9/1/11

9/6/11 AD
* Recorded on daily Data Sheet AD 4/21/11
QC'd - NS

*1 Died During emergence - 5/4/11 & 5/2/11 DS 8/29/11

F = Female
M = MALE

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 3.0-60%							
	Replicate 1	Replicate 2	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 11	Replicate 12
	4/14/11	4/14/11	4/15/11	4/22/11	4/19/11	4/14/11	4/18/11	4/15/11
	4/14/11	4/14/11	4/20/11	4/22/11	4/20/11	4/17/11	4/18/11	4/17/11
	4/18/11	4/17/11	4/22/11	4/26/11	4/23/11	4/19/11	4/22/11	4/17/11
	4/18/11	4/18/11	4/22/11	4/27/11	4/25/11	4/19/11	4/21/11	4/19/11
	4/20/11	4/20/11	4/23/11	4/28/11	4/29/11	4/23/11	4/23/11	4/20/11
	4/23/11	5/2/11	4/24/11	5/6/11	5/1/11	4/26/11	4/26/11	4/24/11
	4/26/11	5/2/11	4/24/11	5/7/11	5/4/11	4/28/11	4/26/11	4/24/11
	4/28/11	5/3/11	4/25/11			4/30/11		4/24/11
			4/29/11			4/30/11		4/25/11
						4/30/11		4/27/11
						5/2/11		4/27/11
						5/2/11		
earliest hatch date	4/14/11	4/14/11	4/15/11	4/22/11	4/19/11	4/14/11	4/18/11	4/15/11
Day of First Hatch	21	21	22	29	26	21	25	22
total number emerged-alive	8	8	9	7	6	11	7	11
Total number unemerged/dead					1	1		
Total number of pupae		1		1	1			

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	5	5
4/15/2011	2	7
4/16/2011	0	7
4/17/2011	4	11
4/18/2011	5	16
4/19/2011	4	20
4/20/2011	5	25
4/21/2011	1	26
4/22/2011	5	31
4/23/2011	5	36
4/24/2011	5	41
4/25/2011	3	44
4/26/2011	5	49
4/27/2011	3	52
4/28/2011	3	55
4/29/2011	2	57
4/30/2011	3	60
5/1/2011	1	61
5/2/2011	3	64
5/3/2011	1	65
5/4/2011	0	65
5/5/2011	0	65
5/6/2011	1	66
5/7/2011	1	67
5/8/2011	0	67
5/9/2011	0	67
5/10/2011	0	67
5/11/2011	0	67
5/12/2011	0	67
5/13/2011	0	67

TVA: 5069-03

Clinch River

QC'd by: NW

Sample ID: CRM 3.0

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893

Sample ID: CRM 3.0 Concentration: 80%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47

Date: 5/10/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8969

Number Daily Renewals: 2

☒ DS 1640 renewal time/Initials ☒ DR 1900 renewal time/Initials

☐ — renewal time/Initials ☐ — renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1400 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			
2			NAV BHV
3			
4			
5			
6			
7			
8	22.7	3.1	
9	22.8	3.2	
10			
11			
12			

Test Day: Day 48

Date: 5/11/11 test termination

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8969

Number Daily Renewals: 1

☑ 1640 EB renewal time/Initials ☐ — renewal time/Initials

☐ — renewal time/Initials ☐ — renewal time/Initials

Food: TFS (Tetrafin 4g/L)# — ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 1300 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations #9 exp @ termination NW
1				
2				NAV 0 BHV
3				0
4				0
5				0
6	22.1	4.4	7.85	1 pupa
7	22.1	3.9	7.78	0
8				0
9				0
10				
11				
12				

Sconduct

279.6
276.5

NH4- 0.1408 EB

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

	Start	End	mL Used	
Hardness	38.8	42.1	3.3	132
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0
Concentration: 80%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893
Sample ID: CRM 3.0 Concentration: 80%
Test Species: *Chironomus dilutus*
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD 5/11/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)
1	* ~~4/24/11 M~~ ~~4/23/11 M~~	4/18/11 M	4/15/11 M	4/19/11 M	4/15/11 M	4/18/11 M	4/14/11 M	4/14/11
2	4/19/11 M	4/19/11 M	4/16/11 M	4/22/11 F	4/18/11 M	4/21/11 M	4/18/11 F	4/17/11 M
3	4/20/11 M	4/21/11 M *	4/18/11 M	4/23/11 M	4/19/11 M	4/22/11 M	4/18/11 M * dead in emerg	4/17/11 M
4	4/21/11 M	~~4/23/11 M~~ 4/23 new fn SRW 8/25/11	4/26/11 F	4/24/11 ⊛	4/19/11 M	4/23/11 F	4/20/11 F	4/19/11 M
5	* 4/24 M ~~4/23/11 M~~	4/23/11 M	4/26/11 F	4/24/11 ⊛	4/23/11 F	4/25/11 F	4/21/11 M	4/19/11 new 8/25/11 M
6	* 4/24 M ~~4/23/11 F~~	4/24/11 F	4/27/11 F	4/26/11 F	4/24/11 F	4/25/11 F	4/21/11 F	4/20/11 F
7	4/25/11 M	4/27/11 M	4/29/11 F	4/27/11 F	5/8/11 M	4/26/11 F	4/23/11 F	4/21/11 M
8	4/26/11 F	4/28/11 F	5/01/11 F	4/30/11 F	/	4/27/11 F	/	4/23/11 M
9	4/26/11 F	4/29/11 F	5/4/11 F	5/01/11 F	/	/	/	4/24/11 F
10	5/8/11 F	4/30/11 ~~4/29/11~~ F	5/4/11 F	5/2/11 M	/	/	/	/
11	/	DS 8/29/11 5/7/11 F	/	5/2/11 F	/	/	/	/
12	/	/	/	/	/	/	/	/
Hatched Totals	10E♂	11E♂	10E♂	9E♂ + 2U	7E♂ 1TT	8E♂	6E♂ 1U	9E♂

20 Day Survival	Rep 1 - 11 /12	Rep 10 - 10 /12	Rep 11 - 12 /12	Rep 12 - 12 /12

*4/24/11 3 Males - line 1, 5 + 6 - new fn SRW 8/25/11

⊛ 4/24/11 Rep 5 Partial Emergence + Dead new fn SRW 8/25/11

*, Died During Emergence 8/29/11 DS

M = Male
F = Female

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
MW 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11

new signed for 9/7/11 Techs in field
SRW 9/1/11
NS 9/1/11
DR 9/1/11

9/6/11 AD
* Recorded on Daily Data Sheet AD 4/21/11
QC'd - NS

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 3.0-80%							
	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 9
	4/24/11	4/18/11	4/15/11	4/19/11	4/15/11	4/18/11	4/14/11	4/14/11
	4/19/11	4/19/11	4/16/11	4/22/11	4/18/11	4/21/11	4/18/11	4/17/11
	4/20/11	4/21/11	4/18/11	4/23/11	4/19/11	4/22/11	4/18/11	4/17/11
	4/21/11	4/23/11	4/26/11	4/24/11	4/19/11	4/23/11	4/20/11	4/19/11
	4/24/11	4/23/11	4/26/11	4/24/11	4/23/11	4/25/11	4/21/11	4/19/11
	4/24/11	4/24/11	4/27/11	4/26/11	4/24/11	4/25/11	4/21/11	4/20/11
	4/25/11	4/27/11	4/29/11	4/27/11	5/8/11	4/26/11	4/23/11	4/21/11
	4/26/11	4/28/11	5/1/11	4/30/11		4/27/11		4/23/11
	4/26/11	4/29/11	5/4/11	5/1/11				4/24/11
	5/8/11	4/30/11	5/4/11	5/2/11				
		5/7/11		5/2/11				
earliest hatch date	4/19/11	4/18/11	4/15/11	4/19/11	4/15/11	4/18/11	4/14/11	4/14/11
Day of First Hatch	26	25	22	26	22	25	21	21
total number emerged-alive	10	11	10	9	7	8	6	9
Total number unemerged/dead				2			1	
Total number of pupae					1			

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	2	2
4/15/2011	2	4
4/16/2011	1	5
4/17/2011	2	7
4/18/2011	5	12
4/19/2011	7	19
4/20/2011	3	22
4/21/2011	6	28
4/22/2011	2	30
4/23/2011	7	37
4/24/2011	6	43
4/25/2011	3	46
4/26/2011	6	52
4/27/2011	4	56
4/28/2011	1	57
4/29/2011	2	59
4/30/2011	2	61
5/1/2011	2	63
5/2/2011	2	65
5/3/2011	0	65
5/4/2011	2	67
5/5/2011	0	67
5/6/2011	0	67
5/7/2011	1	68
5/8/2011	2	70
5/9/2011	0	70
5/10/2011	0	70
5/11/2011	0	70
5/12/2011	0	70
5/13/2011	0	70

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0

QC'd by: NW

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 49

Date: 5/12/11 Last termination

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 89169

Number Daily Renewals: 1

☒ 1640 EB renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1100 DS chemistries time/Initial

Hardness
Start: 30.5
End: 33.7
mL Used: 3.2
128

Alkalinity
Start: 37.7
End: 43.1
mL Used: 5.4
108

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations	# of dead termination
1	22.7	3.7	NAV BHV	0
2	DS 9/1/11			0
3	~~22.5~~ 22.8	3.9		0
4				
5				
6			NAV	0
7				1 pupae
8				
9			NAV	1 pupae
10				
11			NAV	1 pupae
12				

NH4+ 0.06 J EB

pH	Conduct
7.56	275.6
7.56	274.6

Test Day: Day 50

Date: 5/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number):

Number Daily Renewals:

☐ renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 3.0
Concentration: 100%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8893
Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 100%
Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*
Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011
Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011
Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/12/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)
1	4/15/11 M	4/18/11 m	4/18/11 m	4/13/11 M (mw 8/25/11)	4/15/11 m	4/15/11 M	4/18/11 M	4/18/11 M
2	4/19/11 M	4/19/11 M	4/19/11 M	4/14/11 M	4/17/11 m	4/15/11 M	4/25/11 M	4/19/11 M
3	4/22/11 m	4/19/11 M	4/21/11 F	4/18/11 F	4/19/11 F	4/18/11 M	4/29/11 M	4/22/11 m
4	4/22/11 F	4/22/11 F	4/22/11 F	4/18/11 F	4/19/11 M	4/22/11 m	4/30/11 F	4/24/11 F (mw 8/25/11)
5	4/21/11 F	4/24/11 * died emerge	4/22/11 m	4/12/11 (*)	4/20/11 M	4/21/11 unknown *	4/30/11 F	4/25/11 F
6	(1) ~~4/21/11~~ 9/6/11 MD AD *	4/25/11 F	4/26/11 F		4/22/11 F	4/24/11 F	4/30/11 M	4/25/11 F (25 of 8/29/11)
7	4/23/11 M	4/26/11 F	4/26/11 F		4/24/11 F	4/27/11 F	5/2/11 M	4/25/11 M
8	4/23/11 F	~~4/27/11~~ 4/27/11 DS 8/29/11 F	5/01/11 F			4/29/11 F	5/4/11 F	4/27/11 F
9	4/24/11 F	4/27/11 F	5/4/11 M			4/30/11 M	5/4/11 F	4/28/11 F
10	4/25/11 F	4/29/11 M				5/6/11 M	5/5/11 F	
11							5/8/11 M	
12		1 chironomid 4/26 dead - noted on data sheets					5/9/11 F	
Hatched Totals	9E^{S}	8E^{S} + 2U (9E^{S}) mw 5/23/11	9E^{S}	5E^{S}	7E^{S} + 1TT	10E^{S} + 1TT	12E^{S}	9E^{S} + 1TT
20 Day Survival	Rep 4 - 12/12		Rep 5 - 11/12		Rep 8 - 12/12		Rep 12 - 12/12	

Tech Initials:
AS 8/26/11
DS 8/29/11
MLL 8/29/11
mw 8/29/11
AD 8/29/11
EB 9/1/11

QC Initials:
AS 8/26/11
mw 9/1/11 Signed for Techs in field
SEW 9/1/11
NS 9/1/11
DR 9/1/11

(1) wrote on wrong rep. See rep 9. 9/9/11 9/6/11 MD

* 4/24/11 died 1/8 Emerged mw FAS 8/25/11

(*) 4/12/11 recorded on data sheet - mw

S = sieved no orgs

* Recorded on Daily Data Sheet AD 4/21/11 Q.C'd - NS

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = Male
F = Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 3.0-100%							
	Replicate 1	Replicate 2	Replicate 3	Replicate 6	Replicate 7	Replicate 9	Replicate 10	Replicate 11
	4/15/11	4/18/11	4/18/11	4/13/11	4/15/11	4/15/11	4/18/11	4/18/11
	4/19/11	4/19/11	4/19/11	4/14/11	4/17/11	4/15/11	4/25/11	4/19/11
	4/22/11	4/19/11	4/21/11	4/18/11	4/19/11	4/18/11	4/29/11	4/22/11
	4/22/11	4/22/11	4/22/11	4/18/11	4/19/11	4/22/11	4/30/11	4/24/11
	4/21/11	4/24/11	4/22/11	4/12/11	4/20/11	4/21/11	4/30/11	4/25/11
	4/23/11	4/25/11	4/26/11		4/22/11	4/24/11	4/30/11	4/25/11
	4/23/11	4/26/11	4/26/11		4/24/11	4/27/11	5/2/11	4/25/11
	4/24/11	4/27/11	5/1/11			4/29/11	5/4/11	4/27/11
	4/25/11	4/27/11	5/4/11			4/30/11	5/4/11	4/28/11
		4/29/11				5/6/11	5/5/11	
							5/8/11	
		4/26-one dead chiro					5/9/11	
earliest hatch date	4/15/11	4/18/11	4/18/11	4/12/11	4/15/11	4/15/11	4/18/11	4/18/11
Day of First Hatch	22	25	25	19	22	22	25	25
total number emerged-alive	9	9	9	5	7	10	12	9
Total number unemerged/dead		0						
Total number of pupae					1	1		1
Dead larvae and pupae		1						

4/12/2011: data recorded on daily sheets prior to the start of emergence sheets

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	23	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 3.0-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	1	1
4/13/2011	1	2
4/14/2011	1	3
4/15/2011	4	7
4/16/2011	0	7
4/17/2011	1	8
4/18/2011	7	15
4/19/2011	7	22
4/20/2011	1	23
4/21/2011	3	26
4/22/2011	8	34
4/23/2011	2	36
4/24/2011	4	40
4/25/2011	6	46
4/26/2011	3	49
4/27/2011	4	53
4/28/2011	1	54
4/29/2011	3	57
4/30/2011	4	61
5/1/2011	1	62
5/2/2011	1	63
5/3/2011	0	63
5/4/2011	3	66
5/5/2011	1	67
5/6/2011	1	68
5/7/2011	0	68
5/8/2011	1	69
5/9/2011	1	70
5/10/2011	0	70
5/11/2011	0	70
5/12/2011	0	70
5/13/2011	0	70

TVA: 5069-03

Clinch River

QC'd by: [illegible]

Sample ID: CRM 4.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895

Sample ID: CRM 4.0 Concentration: 10%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 49

Date: 5/12/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8969

Number Daily Renewals: 2

☒ 640 EB renewal time/Initials ☒ 1915 MU renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# 038 ☒ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1500 EB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV
2			
3			NAV
4			
5			
6	22.9	3.8	NAV
7	23.0	3.7	
8			
9			NAV
10			
11			
12			NAV

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

Test Day: Day 50

Date: 5/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number):

Number Daily Renewals: 1

☒ 3.5 6:20 renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

☒ 1200 EB chemistries time/Initial

Replicate	Temperature (23± 1°C)* Temp SC	Dissolved Oxygen (mg/L)*	pH	Observations ☒ @ dark terminate
1	22.8 278.5	3.3	7.59	NAV 0
2				
3	22.8 287.5	3.9	7.73	NAV
4				
5				
6				NAV 0
7				0
8				
9				NAV 0
10				0
11				
12				NAV 0

Hardness: 132

end: 14.1

start: 10.8

used: 3.3

Alkalinity: 117

end: 41.9

start: 39.1

used: 2.8

* on 25mL sample

NH4 = 0.0328

AD

* NAV for EB 5/25/11

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

Concentration: 10%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895 Tech Initials: 8/9/11 Test Photoperiod: 16:8 QC Initials:

Sample ID: CRM 4.0 Concentration: 10% AB 8/20/11 NWS 8/29/11 Test System: 175mL Manual Delivery AB 8/26/11

Test Species: *Chironomus dilutus* MLL 8/29/11 DS 8/29/11 Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011 NWS signed for tests 9/7/11 Infield: SRW 9/1/11 NS 9/1/11 DR 9/1/11 Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011 Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/13/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/15/11 m	4/22/11 m	4/18/11 M	4/16/11 M	4/19/11 M	4/15/11 m	4/15/11 m	4/17/11 m
2	4/16/11 F	4/25/11 F	4/21/11 M	4/20/11 F	4/24/11 F	4/15/11 m	4/17 m	4/17/11 m
3	4/18/11 m	4/28/11 f	4/20/11 m *	4/24/11 F	4/24/11 F	4/19/11 m	4/18/11 m	4/18/11 M
4	4/20/11 M	4/29/11 F	4/24/11 M	4/30/11 F	4/26/11 m	4/19/11 m	4/20/11 M	4/19/11 m
5	4/20/11 F	5/01/11 F	~~4/24/11~~ 24 NWS 8/25/11 M for SRW	5/01/11 F	4/28/11 f	4/20/11 F	4/20/11 F	4/23/11 M
6	4/22/11 F	5/2/11 DS 8/29/11 ~~5/1/11~~ F	4/30/11 F	5/4/11 m	4/29/11 m	4/22/11 m	4/22/11 F	~~4/24/11 M~~ DS 8/29/11 5/01/11 F SRW NWS for SRW 8/25/11
7	4/25/11 F	~~5/4/11 M~~	4/30/11 F	5/4/11 F	4/30/11 F	4/25/11 F	4/22/11 M	5/2/11 F
8	4/26/11 F	5/4/11 M NWS 8/25/11	~~5/2/11~~ 5/2/11 DS 8/16/11 F		5/4/11 F	4/27/11 F	4/26/11 F	5/4/11 F
9	5/01/11 F		5/4/11 F		5/7/11 F			5/10/11 M
10								
11								
12							2 chiro. dead 4/30 - recorded on data sheet	NWS for NS 8/25/11
Hatched Totals	9E^S	7E^S + 1TT	9E^S	7E^S + 2TT	9E^S	8E^S	8E^S + 2U	9E^S
20 Day Survival	Rep 2 - 11+1p/12		Rep 5 - 12/12		Rep 8 - 12/12		Rep 11 - 11+1p/12	

DS 8/29/11

9/6/11 AD

* Recorded on Daily Data Sheet QC-d-NS 4/21/11 AD

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = MALE
F = Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 4.0-10%							
	Replicate 1	Replicate 3	Replicate 4	Replicate 6	Replicate 7	Replicate 9	Replicate 10	Replicate 12
	4/15/11	4/22/11	4/18/11	4/16/11	4/19/11	4/15/11	4/15/11	4/17/11
	4/16/11	4/25/11	4/21/11	4/20/11	4/24/11	4/15/11	4/17/11	4/17/11
	4/18/11	4/28/11	4/20/11	4/24/11	4/24/11	4/19/11	4/18/11	4/18/11
	4/20/11	4/29/11	4/24/11	4/30/11	4/26/11	4/19/11	4/20/11	4/19/11
	4/20/11	5/1/11	4/24/11	5/1/11	4/28/11	4/20/11	4/20/11	4/23/11
	4/22/11	5/2/11	4/30/11	5/4/11	4/29/11	4/22/11	4/22/11	5/1/11
	4/25/11	5/4/11	4/30/11	5/4/11	4/30/11	4/25/11	4/22/11	5/2/11
	4/26/11		5/2/11		5/4/11	4/27/11	4/26/11	5/4/11
	5/1/11		5/4/11		5/7/11			5/10/11
							4/30-2 dead chiro	
earliest hatch date	4/15/11	4/22/11	4/18/11	4/16/11	4/19/11	4/15/11	4/15/11	4/17/11
Day of First Hatch	22	29	25	23	26	22	22	24
total number emerged-alive	9	7	9	7	9	8	8	9
Total number unemerged/dead								
Total number of pupae		1		2				
Dead larvae and pupae							2	

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-10%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	0	0
4/15/2011	4	4
4/16/2011	2	6
4/17/2011	3	9
4/18/2011	4	13
4/19/2011	4	17
4/20/2011	7	24
4/21/2011	1	25
4/22/2011	5	30
4/23/2011	1	31
4/24/2011	5	36
4/25/2011	3	39
4/26/2011	3	42
4/27/2011	1	43
4/28/2011	2	45
4/29/2011	2	47
4/30/2011	4	51
5/1/2011	4	55
5/2/2011	3	58
5/3/2011	0	58
5/4/2011	6	64
5/5/2011	0	64
5/6/2011	0	64
5/7/2011	1	65
5/8/2011	0	65
5/9/2011	0	65
5/10/2011	1	66
5/11/2011	0	66
5/12/2011	0	66
5/13/2011	0	66

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

QC'd by: AWT Concentration: 20%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895	Test Photoperiod: 16:8
Sample ID: CRM 4.0 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 49	Test Day: Day 50
Date: 5/12/11	Date: 5/13/11
Overlying Water: CRM 7.0 Site Water (CRW)	Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969	Overlying Water Batch ID (GLC Number):
Number Daily Renewals: 2	Number Daily Renewals: 1
☑ 640 EB renewal time/Initials ☒ 1915 MLL renewal time/Initials	☒ DS 6:20 renewal time/Initials ☐ / renewal time/Initials
☐ / renewal time/Initials ☐ / renewal time/Initials	☐ / renewal time/Initials ☐ / renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate	Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a	Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 1500 EB chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			NAV
2			
3			NAV
4			
5			NAV
6	22.9	3.3	
7	22.9	2.9	
8			
9			NAV
10			
11			NAV
12			

☒ 1300 EB chemistries time/Initial

Replicate	Temperature (23± 1°C)* Temp	SC	Dissolved Oxygen (mg/L)*	pH	Observations	# @ Emergence
1	22.8	282.8	4.5	7.75	FOV NAV	0
2						
3	22.8	277.7	4.6	7.71		1
4						
5						1
6	Pour on EB 8/25/11					0
7						0
8						
9						0
10						
11						0
12						

Hardness: 132
end: 17.4
start: 14.1
used: 3.3
Alkalinity: 110
end: 47.5
start: 42.0
used: 5.5
NH4 = 0.0
AE 438
@ Pour for EB 8/25/11

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

Concentration: 20%

[redacted]

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895 | Tech Initials: EB 9/1/11 | Test Photoperiod: 16:8 | QC Initials: AS 8/26/11

Sample ID: CRM 4.0 | Concentration: 20% | AS 8/26/11 AWS 8/29/11 | Test System: 175mL Manual Delivery

Test Species: *Chironomus dilutus* | MLL 8/29/11 DS 8/29/11 | Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011 | AWS signed for feds | in field: SRW 9/1/11 NS 9/1/11 9/7/11 DR 9/1/11 | Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011 | Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/13/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/16/11 M	4/17/11 M	4/16/11 M	4/15/11 M	4/22/11 M	4/17/11 M	4/18/11 M	4/16/11 M
2	4/18/11 M	4/23/11 M	4/18/11 M	4/21/11 M	4/23/11 F	4/21/11 M	4/21/11 M	4/17/11 M
3	4/18/11 M	4/27/11 M	4/21/11 M	4/25/11 F	4/25/11 F	4/24/11 M	4/20/11 M *	4/19/11 M
4	4/27/11 M	4/29/11 F	4/27/11 F	4/26/11 F	4/26/11 F	4/29/11 F	4/23/11 F	4/21/11 M
5	4/28/11 M	5/01/11 M	4/27/11 F	4/28/11 F	4/27/11 M	~~4/30~~ 5/1/11 F (MB 8/29/11 MD)	4/24/11 F	4/23/11 M
6	4/29/11 F	5/2/11 M	4/29/11 F	4/29/11 F	5/01/11 F	5/4/11 M	4/26/11 F	4/23/11 M
7	5/3/11 F	5/2/11 F	4/30/11 M	5/4/11 M	5/01/11 F		4/27/11 F	4/24/11 M
8	5/4/11 F	5/3/11 F	5/4/11 F	4/13/11 M	5/01/11 F		5/01/11 F	4/27/11 F
9	5/10/11 unknown AWS 9/1/11	5/6/11 M			5/7/11 M			4/27/11 F
10								4/27/11 F
11				1 chiro dead noted on data sheet - 4/27	AWS for NS 8/25/11			4/29/11 F
12				1 chiro. dead noted on data sheet 4/26				5/01/11 F
Hatched Totals	9ES	9ES+1TT	8ES+1TT	8ES+2U	9ES	6ES	8ES+ ~~0TT~~ AWS 8/25/11	12S

20 Day Survival	Rep 2 - 12/12	Rep 4 - 12/12	Rep 8 - 8+2p/12	Rep 10 - 11+1p/12

9/8/11 DS ~~DS 8/29/11~~

9/6/11 AO

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

S = Sieved no orgs.
M = Male
F = Female

* 4/13/11 data sheet AWS 8/25/11
* Recorded on Daily Data Sheet QC'd - NS 4/21/11 AO
* 5/6/11 - mayfly hatched from rep 11

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 4.0-20%							
	Replicate 1	Replicate 3	Replicate 5	Replicate 6	Replicate 7	Replicate 9	Replicate 11	Replicate 12
	4/16/11	4/17/11	4/16/11	4/15/11	4/22/11	4/18/11	4/18/11	4/16/11
	4/18/11	4/23/11	4/18/11	4/21/11	4/23/11	4/21/11	4/21/11	4/17/11
	4/18/11	4/27/11	4/21/11	4/25/11	4/25/11	4/24/11	4/20/11	4/19/11
	4/27/11	4/29/11	4/27/11	4/26/11	4/26/11	4/29/11	4/23/11	4/21/11
	4/28/11	5/1/11	4/27/11	4/28/11	4/27/11	5/1/11	4/24/11	4/23/11
	4/29/11	5/2/11	4/29/11	4/29/11	5/1/11	5/4/11	4/26/11	4/23/11
	5/3/11	5/2/11	4/30/11	5/4/11	5/1/11		4/27/11	4/24/11
	5/4/11	5/3/11	5/4/11	4/13/11	5/1/11		5/1/11	4/27/11
	5/10/11	5/6/11			5/7/11			4/27/11
								4/27/11
				4/26-1 dead chiro				4/29/11
				4/27-1 dead chiro				5/1/11
earliest hatch date	4/16/11	4/17/11	4/16/11	4/13/11	4/22/11	4/18/11	4/18/11	4/16/11
Day of First Hatch	23	24	23	20	29	25	25	23
total number emerged-alive	9	9	8	8	9	6	8	12
Total number unemerged/dead				2				
Total number of pupae		1	1					
Dead larvae and pupae				2				

4/13/2011: data recorded on daily sheets prior to the start of emergence sheets

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-20%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	1	1
4/14/2011	0	1
4/15/2011	1	2
4/16/2011	3	5
4/17/2011	2	7
4/18/2011	5	12
4/19/2011	1	13
4/20/2011	1	14
4/21/2011	5	19
4/22/2011	1	20
4/23/2011	5	25
4/24/2011	3	28
4/25/2011	2	30
4/26/2011	3	33
4/27/2011	9	42
4/28/2011	2	44
4/29/2011	6	50
4/30/2011	1	51
5/1/2011	7	58
5/2/2011	2	60
5/3/2011	2	62
5/4/2011	4	66
5/5/2011	0	66
5/6/2011	1	67
5/7/2011	1	68
5/8/2011	0	68
5/9/2011	0	68
5/10/2011	1	69
5/11/2011	0	69
5/12/2011	0	69
5/13/2011	0	69

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895

Sample ID: CRM 4.0 Concentration: 40%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 46

Date: 5/9/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8458

☒ 1200 MWW chemistries time/Initial

Number Daily Renewals: 1

~~DS~~ 6:15 renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations * @ Start MWW End Terminal
1	23.0	7.07	4.0	279.3	1 pupae
2	/	/	/	/	/
3					
4					
5					0
6					1 pupae
7	23.0	7.64	4.2	283.1	0
8	/	/	/	/	/
9					0
10					0
11					
12					

Start	End	mL Used	Hardness
28.6	32.1	3.5	140

Start	End	mL Used	Alkalinity
36.0	41.5	5.5	110

NH4 = 0.02 U

eb

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0
Concentration: 40%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895 — Tech Initials: — Test Photoperiod: 16:8 — QC Initials:

Sample ID: CRM 4.0 — Concentration: 40% — AS 8/26/11 — Test System: 175mL Manual Delivery — AS 8/26/11

Test Species: *Chironomus dilutus* — MLL 8/29/11 — DS 8/29/11 — Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011 — 9/1/11 — Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011 — 9/7/11 — Test Termination Date: 20 day: April 13, 2011 and Emergence TBD — 5/9/11 DS 8/29/11

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)
1	4/15/11 M	4/16/11 M	4/18/11 M	4/20/11 M	4/21/11 F	4/14/11 M	4/19/11 M	4/15/11 M
2	4/16/11 M	4/19/11 M	4/18/11 M	4/20/11 M	4/22/11 M	4/15/11 M	4/20/11 M	4/15/11 M
3	4/20/11 M	4/19/11 M	* Died in emergence 4/18/11 M	4/21/11 M	4/23/11 M	4/16/11 M	4/22/11 F	4/19/11 F
4	4/20/11 F	4/20/11 M	4/19/11 M	4/21/11 M	4/24/11 M	4/16/11 M	4/22/11 F	4/22/11 F
5	4/21/11 M	4/23/11 M	4/19/11 F	4/21/11 F	4/26/11 M	4/19/11 M	4/23/11 F	4/23/11 F
6	4/24/11 M	4/23/11 M	4/20/11 M	4/23/11 M	4/28/11 F	4/22/11 M	4/24/11 F	4/24/11 F
7	4/27/11 M	4/26/11 F	4/23/11 F	4/24/11 F	4/28/11 F	4/24/11 F	5/2/11 M	5/2/11 M
8	4/29/11 F	4/30/11 M	4/27/11 M	5/2/11 M	5/2/11 M	4/24/11 F	5/4/11 M	5/4/11 M
9	5/3/11 unknown	4/30/11 F	4/28/11 F			4/26/11 F	4/13/11 * M	
10		5/01/11 F				4/28/11 F		
11		5/01/11 M				4/28/11 F		
12		5/2/11 M				4/29/11 F		
Hatched Totals	9ES + 1TT	12SE	8ES + 1U	8ES + 1TT	8ES	12SE	9ES	8ES
20 Day Survival	Rep 3 - 12/12		Rep 4 - 12/12		Rep 11 - 11/12		Rep 12 - 6+4D/12	

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

* 4/13/11 data sheet - Mab 8/25/11 — DS 8/29/11 — * Died while emergence
S - Signed on Page

M = Male
F = Female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 4.0-40%							
	Replicate 1	Replicate 2	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 9	Replicate 10
	4/15/11	4/16/11	4/18/11	4/20/11	4/21/11	4/14/11	4/19/11	4/15/11
	4/16/11	4/19/11	4/18/11	4/20/11	4/22/11	4/15/11	4/20/11	4/15/11
	4/20/11	4/19/11	4/18/11	4/21/11	4/23/11	4/16/11	4/22/11	4/19/11
	4/20/11	4/20/11	4/19/11	4/21/11	4/24/11	4/16/11	4/22/11	4/22/11
	4/21/11	4/23/11	4/19/11	4/21/11	4/26/11	4/19/11	4/23/11	4/23/11
	4/24/11	4/23/11	4/20/11	4/23/11	4/28/11	4/22/11	4/24/11	4/24/11
	4/27/11	4/26/11	4/23/11	4/24/11	4/28/11	4/24/11	5/2/11	5/2/11
	4/29/11	4/30/11	4/27/11	5/2/11	5/2/11	4/24/11	5/4/11	5/4/11
	5/3/11	4/30/11	4/28/11			4/26/11	4/13/11	
		5/1/11				4/28/11		
		5/1/11				4/28/11		
		5/2/11				4/29/11		
earliest hatch date	4/15/11	4/16/11	4/18/11	4/20/11	4/21/11	4/14/11	4/13/11	4/15/11
Day of First Hatch	22	23	25	27	28	21	20	22
total number emerged-alive	9	12	8	8	8	12	9	8
Total number unemerged/dead			1					
Total number of pupae	1			1				

4/13/2011: data recorded on daily sheets prior to the start of emergence sheets

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/16/11	24	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-40%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	1	1
4/14/2011	1	2
4/15/2011	4	6
4/16/2011	4	10
4/17/2011	0	10
4/18/2011	2	12
4/19/2011	7	19
4/20/2011	7	26
4/21/2011	5	31
4/22/2011	5	36
4/23/2011	7	43
4/24/2011	7	50
4/25/2011	0	50
4/26/2011	3	53
4/27/2011	2	55
4/28/2011	5	60
4/29/2011	2	62
4/30/2011	2	64
5/1/2011	2	66
5/2/2011	5	71
5/3/2011	1	72
5/4/2011	2	74
5/5/2011	0	74
5/6/2011	0	74
5/7/2011	0	74
5/8/2011	0	74
5/9/2011	0	74
5/10/2011	0	74
5/11/2011	0	74
5/12/2011	0	74
5/13/2011	0	74

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895

Sample ID: CRM 4.0 Concentration: 60%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 46

Date: 5/9/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 8958

Number Daily Renewals: 1

☒ 1405 DS renewal time/Initials ☐ / renewal time/Initials

☐ / renewal time/Initials ☐ / renewal time/Initials

Food: TFS (Tetrafin 4g/L)# / ☐ Feed 1.5 ml/replicate

☒ 1430 eB chemistries time/Initial

Screens Cleaned: ☐ yes ☒ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Observations # @ start termin emer
1	23.6	7.68	3.7	275.6	0
2	23.6	7.75	4.1	285.3	0
3					0
4					0
5					
6					0
7					0
8					
9					0
10					
11					
12					0

Start	End	mL Used	Hardness
35.2	39.1	3.9	156

Start	End	mL Used	Alkalinity
2.3 ~~46.1~~ AB 4/29/11	7.8	5.5	110

NH4 = 0.01 U eB

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Hole Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

Concentration: 60%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895 | Tech Initials: | Test Photoperiod: 16:8 | QC Initials:

Sample ID: CRM 4.0 | Concentration: 60% | AS 8/26/11 | Test System: 175mL Manual Delivery | AS 8/26/11

Test Species: *Chironomus dilutus* | MLL 8/29/11 DS 8/29/11 | Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011 | EB 9/1/11 DEG 9/1/11 | Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011 | Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/9/11 DS 9/8/11 ~~DS 8/27/11~~

Hatched Individual	Replicate 1 (Hatch Date/Sex)	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/15/11 m	4/19/11 M	4/22/11 m	4/18/11 M	4/17/11 M	* AS 8/26/11 4/17/11 ~~2~~M	4/22/11 m	4/17/11 unknown
2	4/19/11 M	4/21/11 M	4/25/11 M	4/19/11 M	4/18/11 M	4/18/11 M	4/22/11 m	4/19/11 F
3	4/22/11 m	4/22 m	4/28/11 f	4/24/11 M	4/21/11 M	4/18/11 M	4/23/11 F	4/19/11 M
4	4/22/11 F	4/~~22~~ 23/11 F	4/28/11 f	4/24/11 F	4/22/11 F	* RS 8/26/11 4/17/11 M	4/26/11 f	4/27/11 F
5	4/24/11 M	4/25/11 died in emerg F*	4/29/11 F	4/27/11 F	4/26/11 m	4/22/11 F	4/26/11 f	4/27/11 ~~4/27/11~~ DS 8/29/11 F
6	4/25/11 F	4/26/11 f	5/01/11 M	5/01/11 F	4/26/11 f	4/20/11 M *	4/27/11 M	4/29/11 F
7	4/26/11 f	5/01/11 F	5/5/11 F	5/2/11 F	4/27/11 F	4/23/11 F	4/28/11 f	
8	~~4/27/11~~ 4/27/11 DS 8/29/11 F	5/2/11 M	5/6/11 F	5/3/11 F	4/28/11 M	4/24/11 M	4/29/11 F	
9	4/27/11 F	5/2/11 F			5/2/11 F	4/24/11 F	5/6/11 F	
10	5/6/11 M	5/3/11 M				5/4/11 F		
11		5/4/11 F						
12								
Hatched Totals	10ES	10ES+1U	8ES	8ES	9ES	10ES	9ES	6ES
20 Day Survival	Rep 5 - 11 /12		Rep 8 - 12 /12		Rep 10 - 11+1p/12		Rep 11 - 11 /12	

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

* 4/20/11 M original Record 4/21/11 M on Daily Data Sheet

F* died while emerging 4/25/11 AS 8/26/11

*used 1 row instead of 2 separate rows; correction below

M = Male

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MCS

	CRM 4.0-60%							
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 6	Replicate 7	Replicate 9	Replicate 12
	4/15/11	4/19/11	4/22/11	4/18/11	4/17/11	4/17/11	4/22/11	4/17/11
	4/19/11	4/21/11	4/25/11	4/19/11	4/18/11	4/18/11	4/22/11	4/19/11
	4/22/11	4/22/11	4/28/11	4/24/11	4/21/11	4/18/11	4/23/11	4/19/11
	4/22/11	4/23/11	4/28/11	4/24/11	4/22/11	4/17/11	4/26/11	4/27/11
	4/24/11	4/25/11	4/29/11	4/27/11	4/26/11	4/22/11	4/26/11	4/27/11
	4/25/11	4/26/11	5/1/11	5/1/11	4/26/11	4/20/11	4/27/11	4/29/11
	4/26/11	5/1/11	5/5/11	5/2/11	4/27/11	4/23/11	4/28/11	
	4/27/11	5/2/11	5/6/11	5/3/11	4/28/11	4/24/11	4/29/11	
	4/27/11	5/2/11			5/2/11	4/24/11	5/6/11	
	5/6/11	5/3/11				5/4/11		
		5/4/11						
earliest hatch date	4/15/11	4/19/11	4/22/11	4/18/11	4/17/11	4/17/11	4/22/11	4/17/11
Day of First Hatch	22	26	29	25	24	24	29	24
total number emerged-alive	10	10	8	8	9	10	9	6
Total number unemerged/dead		1						
Total number of pupae								

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/18/11	25	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-60%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	0	0
4/15/2011	1	1
4/16/2011	0	1
4/17/2011	4	5
4/18/2011	4	9
4/19/2011	5	14
4/20/2011	1	15
4/21/2011	2	17
4/22/2011	8	25
4/23/2011	3	28
4/24/2011	5	33
4/25/2011	2	35
4/26/2011	6	41
4/27/2011	7	48
4/28/2011	4	52
4/29/2011	3	55
4/30/2011	0	55
5/1/2011	3	58
5/2/2011	4	62
5/3/2011	2	64
5/4/2011	2	66
5/5/2011	1	67
5/6/2011	3	70
5/7/2011	0	70
5/8/2011	0	70
5/9/2011	0	70
5/10/2011	0	70
5/11/2011	0	70
5/12/2011	0	70
5/13/2011	0	70

TVA: 5069-03

Clinch River

QC'd by: [illegible]

Sample ID: CRM 4.0

Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895

Sample ID: CRM 4.0 Concentration: 80%

Test Species: *Chironomus dilutus*

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

Test Initiation Date: March 24, 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: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 49

Date: 5/12/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number): 89169

Number Daily Renewals: 1

☑ 1640 EP renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☑ no ☐ n/a

☒ 1300 [illegible] chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations		pH	Cond
1						
2	22.4	3.6	NAV	1 pupa	7.66	279.6
3						
4			NAV BHV	0 pupae		
5	22.5	3.9		0	7.67	277.6
6						
7			NAV	1 pupa		
8						
9						
10			NAV	0		
11				0		
12						

#8 cup @ test tale down [illegible]

NH4= 0.04 J EP

Hardness
Start: 33.7
End: 37.0
mL used: 3.3
132

Alkalinity
Start: 43.1
End: 48.6
mL used: 5.5
110

Test Day: Day 50

Date: 5/13/11

Overlying Water: CRM 7.0 Site Water (CRW)

Overlying Water Batch ID (GLC Number):

Number Daily Renewals:

☐ renewal time/Initials ☐ renewal time/Initials

☐ renewal time/Initials ☐ renewal time/Initials

Food: TFS (Tetrafin 4g/L)# ☐ Feed 1.5 ml/replicate

Screens Cleaned: ☐ yes ☐ no ☐ n/a

☐ chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations
1				[illegible] 8/5/11
2				NAV
3				
4				NAV BHV
5				
6				
7				NAV
8				
9				
10				NAV
11				
12				

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV: Burrow Holes Visible

* 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.

Terminated Reps

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0
Concentration: 80%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895 | Tech Initials: | Test Photoperiod: 16:8 | QC Initials:

Sample ID: CRM 4.0 | Concentration: 80% | AS 8/26/11 | MWJ 8/29/11 | Test System: 175mL Manual Delivery | AS 8/26/11

Test Species: *Chironomus dilutus* | MLL 8/29/11 | DS 8/29/11 | Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011 | EB 9/1/11 | DRA 9/1/11 | MWJ for signed 9/7/11 | Test Field: SRW 9/1/11 | NS 9/1/11 | Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011 | Test Termination Date: 20 day: April 13, 2011 and Emergence TBD 5/10/11 DS 9/29/11 DS 8/29/11

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 4 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 10 (Hatch Date/Sex)	Replicate 11 (Hatch Date/Sex)
1	4/26/11 ~~F~~ M MWJ 8/25/11 fm NS	4/19/11 M	4/14/11 M	4/16 male	4/17 m	4/20/11 M	4/17/11 m	4/18/11 F
2	4/29/11 M	4/22/11 m	4/15/11 m	4/16/11 M	4/18 M	4/26/11 F	4/17/11 M	4/20/11 M
3	4/30/11 F	4/22/11 F	4/23/11 F	4/16/11 M	4/22/11 m	4/26/11 f	4/18/11 f	4/23/11 F
4	5/01/11 F	4/25/11 F	4/24/11 F	4/17/11 M	4/23/11 F	4/27/11 F	4/19/11 F	4/24/11 F
5	5/4/11 F	4/26/11 m	4/24/11 F	4/20/11 M	4/29/11 F	4/29/11 F	4/20/11 M	4/25/11 F
6	5/5/11 M	4/26/11 f	4/24/11 F	4/20/11 f	5/2/11 F	5/01/11 F	4/20/11 M	MWJ 8/25/11
7	5/6/11 M	5/2/11 F		4/22/11 m	5/8/11 F	5/3/11 F	4/23/11 F	
8	5/7/11 F	5/2/11 F		4/25/11 F		5/4/11 F	~~4/26/11 M~~ MWJ 8/26/11	
9	5/8/11 F	5/3/11 F		4/25/11 M		5/4/11 F	MWJ FOI NS 8/25/11	
10	5/9/11 f	5/7/11 F		4/26/11 F		5/4/11 F		
11				4/29/11 F		5/7/11 M		
12				5/3/11 F		5/7/11 F	2 chironomids dead - noted on data sheets 4/25	
Hatched Totals	10ES+1TT	10ES	6ES	12ES	7ES+1TT	12SE	7ES+2U	5ES

20 Day Survival	Rep 1 - 12/12	Rep 3 - 12/12	Rep 9 - 12/12	Rep 12 - 12/12

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

S = Sieved no orgs.

M = Male
F = female

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 4.0-80%							
	Replicate 2	Replicate 4	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 10	Replicate 11
	4/26/11	4/19/11	4/14/11	4/16/11	4/17/11	4/20/11	4/17/11	4/18/11
	4/29/11	4/22/11	4/15/11	4/16/11	4/18/11	4/26/11	4/17/11	4/20/11
	4/30/11	4/22/11	4/23/11	4/16/11	4/22/11	4/26/11	4/18/11	4/23/11
	5/1/11	4/25/11	4/24/11	4/17/11	4/23/11	4/27/11	4/19/11	4/24/11
	5/4/11	4/26/11	4/24/11	4/20/11	4/29/11	4/29/11	4/20/11	4/25/11
	5/5/11	4/26/11	4/24/11	4/20/11	5/2/11	5/1/11	4/20/11	
	5/6/11	5/2/11		4/22/11	5/8/11	5/3/11	4/23/11	
	5/7/11	5/2/11		4/25/11		5/4/11		
	5/8/11	5/3/11		4/25/11		5/4/11		
	5/9/11	5/7/11		4/26/11		5/4/11		
				4/29/11		5/7/11		
				5/3/11		5/7/11		
							4/25-2 dead chiro	
earliest hatch date	4/26/11	4/19/11	4/14/11	4/16/11	4/17/11	4/20/11	4/17/11	4/18/11
Day of First Hatch	33	26	21	23	24	27	24	25
total number emerged-alive	10	10	6	12	7	12	7	5
Total number unemerged/dead								
Total number of pupae	1				1			
Dead larvae and pupae							2	

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/18/11	25	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-80%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	1	2
4/16/2011	3	5
4/17/2011	4	9
4/18/2011	3	12
4/19/2011	2	14
4/20/2011	6	20
4/21/2011	0	20
4/22/2011	4	24
4/23/2011	4	28
4/24/2011	4	32
4/25/2011	4	36
4/26/2011	6	42
4/27/2011	1	43
4/28/2011	0	43
4/29/2011	4	47
4/30/2011	1	48
5/1/2011	2	50
5/2/2011	3	53
5/3/2011	3	56
5/4/2011	4	60
5/5/2011	1	61
5/6/2011	1	62
5/7/2011	4	66
5/8/2011	2	68
5/9/2011	1	69
5/10/2011	0	69
5/11/2011	0	69
5/12/2011	0	69
5/13/2011	0	69

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

QC'd by: NW

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895	Test Photoperiod: 16:8
Sample ID: CRM 4.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Chironomus dilutus*	Test Temperature: 23± 1°C
Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011	Test Organism Source/Age: ABS < 24 hours
Test Initiation Date: March 24, 2011	Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Test Day: Day 47	Test Day: Day 48
Date: 5/10/11	Date: 5/11/11
Overlying Water: CRM 7.0 Site Water (CRW)	Overlying Water: CRM 7.0 Site Water (CRW)
Overlying Water Batch ID (GLC Number): 8969	Overlying Water Batch ID (GLC Number): 8969
Number Daily Renewals: 2	Number Daily Renewals: 1
☒ DS 6:50 renewal time/Initials ☒ DR 1900 renewal time/Initials	☒ 640 EB renewal time/Initials ☒ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials	☐ — renewal time/Initials ☐ — renewal time/Initials
Food: TFS (Tetrafin 4g/L)# 038 ☑ Feed 1.5 ml/replicate	Food: TFS (Tetrafin 4g/L)# — ☐ Feed 1.5 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a	Screens Cleaned: ☐ yes ☑ no ☐ n/a

☑ 1400 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	Observations
1			
2			NAV BHV
3			
4			
5			NAV BHV
6			
7			
8			
9	23.2	3.9	
10			
11			
12	23.0	3.6	NAV BHV

☒ 1400 AS chemistries time/Initial

Replicate	Temperature (23± 1°C)*	Dissolved Oxygen (mg/L)*	pH	Observations (FOB & BHV not taken down NW)		Specific cond
1						
2				NAV	0 BHV	
3	22.2	5.1	7.85		0	276.8
4						
5	21.9	5.0	7.48	NAV	0	~~276~~ 274.3 AS 5/11
6					0	
7					0 BHV	
8					0	
9					0	NH4= 0.00
10						
11						
12				NAV	0 BHV	

Key: AV: Animals Visible NAV: No Animals Visible FOV: Foreign Organism Visible BHV:Burrow Holes Visible

* 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.

	Start	End	mL used	Terminated Reps
Hardness	16.1	19.5	3.4	136
[illegible]	[illegible]	9.7	5.4	108

GLEC
Great Lakes Environmental Center

TVA: 5069-03

Clinch River

Sample ID: CRM 4.0

Concentration: 100%

Chironomus dilutus Long Term Survival, Growth, and Emergence Whole Sediment Toxicity Test

GLC#: 8895

Tech Initials: AS 8/26/11 MW 8/29/11 MLL 8/29/11 DS 8/29/11

Test Photoperiod: 16:8

QC Initials: AS 8/26/11

Sample ID: CRM 4.0 Concentration: 100%

Test System: 175mL Manual Delivery

Test Species: *Chironomus dilutus*

Test Temperature: 23± 1°C

Date Addition of Sediment: March 23, 2011; CRM 4.0 concentrations added March 24, 2011

MW signed for Tech fold: SAW 9/1/11 9/7/11 NS 9/1/11 DR 9/1/11 EB 9/1/11

Test Organism Source/Age: ABS < 24 hours

Test Initiation Date: March 24, 2011

Test Termination Date: 20 day: April 13, 2011 and Emergence TBD

Hatched Individual	Replicate 2 (Hatch Date/Sex)	Replicate 3 (Hatch Date/Sex)	Replicate 5 (Hatch Date/Sex)	Replicate 6 (Hatch Date/Sex)	Replicate 7 (Hatch Date/Sex)	Replicate 8 (Hatch Date/Sex)	Replicate 9 (Hatch Date/Sex)	Replicate 12 (Hatch Date/Sex)
1	4/22/11 F	4/19/11 M	4/17 M	4/22/11 M	4/16/11 M	4/16 male	4/16/11 M	4/14/11 M
2	4/22/11 M	4/22/11 M	4/24/11 F	4/22/11 F	4/17 M	4/17/11 M	4/18/11 M	4/19/11 M
3	MW 8/25/11 4/22/11 M	4/21/11 M *	4/25/11 M	4/22/11 M	4/17 M	4/25/11 F	4/19/11 F	4/22/11 M
4	4/26/11 F	4/26/11 F	4/27/11 M	4/23/11 M	4/18/11 M	AS 4/26 ~~4/26/11 F~~ 4/26/11 F	4/19/11 M	4/23/11 F
5	4/26/11 F	4/27/11 F	4/27/11 F	4/27/11 F	4/22/11 F	4/27/11 F	4/20/11 F	4/25/11 F
6	4/28/11 F	4/29/11 F	5/3/11 F	4/28/11 F	4/23/11 M	5/3/11 F	4/26 AS ~~4/26/11 F~~	4/27/11 F
7	4/29/11 F	5/4/11 F			4/26/11 F	5/5/11 M		
8	4/29/11 F			4/27/11 F	AS 4/26 ~~4/27/11~~ ~~4/26/11~~ F F	DS 8/29/11 5/7/11 F		
9	5/2/11 F				4/30/11 DS ~~4/30/11~~ F	5/8/11 F		
10					5/01/11 F			
11								
12				1 dead chiro. 5/3 MW for NS 8/25/11				
Hatched Totals	9ES	7ES	6ES	6ES + 1U	10ES	9ES	5ES	6ES

20 Day Survival	Rep 1 - 12 /12	Rep 4 - 12 /12	Rep 10 - 9 /12	Rep 11 - 12 /12

TT: number of live pupae @ test termination
E: fully emerged and live
U: unemerged dead/including partial emergence and dead

M = Male
F = Female

DS 9/13/11 DS 8/29/11

* Recorded on Daily Data Sheet

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Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials: MLS

	CRM 4.0-100%							
	Replicate 2	Replicate 3	Replicate 5	Replicate 6	Replicate 7	Replicate 8	Replicate 9	Replicate 12
	4/22/11	4/19/11	4/17/11	4/22/11	4/16/11	4/16/11	4/16/11	4/14/11
	4/22/11	4/22/11	4/24/11	4/22/11	4/17/11	4/17/11	4/18/11	4/19/11
	4/22/11	4/21/11	4/25/11	4/22/11	4/17/11	4/25/11	4/19/11	4/22/11
	4/26/11	4/26/11	4/27/11	4/23/11	4/18/11	4/26/11	4/19/11	4/23/11
	4/26/11	4/27/11	4/27/11	4/27/11	4/22/11	4/27/11	4/20/11	4/25/11
	4/28/11	4/29/11	5/3/11	4/28/11	4/23/11	5/3/11		4/27/11
	4/29/11	5/4/11			4/24/11	5/5/11		
	4/29/11				4/27/11	5/7/11		
	5/2/11				4/30/11	5/8/11		
					5/1/11			
				5/3-1 dead chiro				
earliest hatch date	4/22/11	4/19/11	4/17/11	4/22/11	4/16/11	4/16/11	4/16/11	4/14/11
Day of First Hatch	29	26	24	29	23	23	23	21
total number emerged-alive	9	7	6	6	10	9	5	6
Total number unemerged/dead								
Total number of pupae								
Dead larvae and pupae				1				

Average Date to First Emergence	Average Days to First Emergence	day of test	date of test
		18	4/11/2011
4/17/11	25	19	4/12/2011
		20	4/13/2011
		21	4/14/2011
		22	4/15/2011
		23	4/16/2011
		24	4/17/2011
		25	4/18/2011
		26	4/19/2011
		27	4/20/2011
		28	4/21/2011
		29	4/22/2011
		30	4/23/2011
		31	4/24/2011
		32	4/25/2011
		33	4/26/2011

Project Name: Tennessee Valley Authority (TVA)-Clinch River
Project Number: 5069-03
Sample ID: CRM 4.0-100%
Tech Initials: mwg

Test Dates: March 24-May 14, 2011
Test Species: Chironomus dilutus
Test Endpoint: Emergence
QC Initials:

Date	Number of emergence per day	Cumulative Emergence
4/11/2011	0	0
4/12/2011	0	0
4/13/2011	0	0
4/14/2011	1	1
4/15/2011	0	1
4/16/2011	3	4
4/17/2011	4	8
4/18/2011	2	10
4/19/2011	4	14
4/20/2011	1	15
4/21/2011	1	16
4/22/2011	9	25
4/23/2011	3	28
4/24/2011	2	30
4/25/2011	3	33
4/26/2011	4	37
4/27/2011	7	44
4/28/2011	2	46
4/29/2011	3	49
4/30/2011	1	50
5/1/2011	1	51
5/2/2011	1	52
5/3/2011	2	54
5/4/2011	1	55
5/5/2011	1	56
5/6/2011	0	56
5/7/2011	1	57
5/8/2011	1	58
5/9/2011	0	58
5/10/2011	0	58
5/11/2011	0	58
5/12/2011	0	58
5/13/2011	0	58

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Surv

Start Date:	3/24/2011	Test ID:	5069-con	Sample ID:	-LCS
End Date:	5/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4	5	6	7	8
GLW	0.8333	1.0000	1.0000	0.8333	1.0000	0.5000	0.4167	1.0000
LCS + GLW	1.0000	0.6667	0.8333	0.7500	0.7500	0.6667	0.6667	0.8333
LCS + CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.8229	1.0676	1.1864	0.7017	1.4260	25.244	8			
LCS + GLW	0.7708	1.0000	1.0859	0.9553	1.4260	14.689	8	*		
LCS + CRW	0.7500	0.9730	1.0621	0.7854	1.2780	15.946	8	0.289	1.761	0.1449

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94836	0.887	0.57464	0.1669
F-Test indicates equal variances (p = 0.88)	1.12747	8.88539		
The control means are not significantly different (p = 0.42)	0.83832	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	0.12961	0.16559	0.00226	0.02706	0.77674	1, 14

ToxCalc v5.0.32

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	3/24/2011	Test ID:	5069-con	Sample ID:	-LCS
End Date:	5/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4	5	6	7	8
GLW	0.8333	1.0000	1.0000	0.8333	1.0000	0.5000	0.4167	1.0000
LCS + GLW	1.0000	0.6667	0.7500	0.7500	0.7500	0.6667	0.6667	0.8333
LCS + CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.8229	1.0822	1.1864	0.7017	1.4260	25.244	8			
LCS + GLW	0.7604	1.0000	1.0730	0.9553	1.4260	14.698	8	*		
LCS + CRW	0.7500	0.9863	1.0621	0.7854	1.2780	15.946	8	0.133	1.761	0.1441

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.92419	0.887	0.70765	0.54437
F-Test indicates equal variances (p = 0.86)	1.15326	8.88539		
The control means are not significantly different (p = 0.36)	0.94806	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	0.13047	0.16901	0.00047	0.02678	0.89596	1, 14

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Survival

Start Date:	03/24/2011	Test ID:	5069-03	Sample ID:	CRM1.5
End Date:	05/14/2011	Lab ID:	GLEC	Sample Type:	WHOLE SEDIMENT
Sample Date:	02/07/2011	Protocol:	EPA 600/R-99/064	Test Species:	Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS+CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS+CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.9167	1.0000	0.7500	0.7500	0.7500	0.5000	1.0000	1.0000
20	0.7500	0.9167	0.8333	0.7500	0.5833	0.8333	0.7500	0.8333
40	1.0000	0.8333	0.4167	1.0000	0.6667	0.7500	0.7500	0.6667
60	0.8333	0.5833	1.0000	0.7500	0.7500	0.8333	0.8333	0.6667
80	0.5833	0.8333	0.6667	0.7500	0.6667	0.6667	0.7500	0.5000
100	0.4167	0.5833	0.5000	0.5000	0.8333	0.5000	0.4167	0.5000

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS+CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8					
CRS+CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8				0.8073	1.0000
10	0.8333	1.0667	1.1854	0.7854	1.4260	20.153	8	-0.690	2.359	0.2260	0.8073	1.0000
20	0.7813	1.0000	1.0924	0.8691	1.2780	10.966	8	0.280	2.359	0.2260	0.7813	0.9677
40	0.7604	0.9733	1.0886	0.7017	1.4260	22.503	8	0.320	2.359	0.2260	0.7708	0.9548
60	0.7813	1.0000	1.0994	0.8691	1.4260	15.128	8	0.207	2.359	0.2260	0.7708	0.9548
80	0.6771	0.8667	0.9706	0.7854	1.1503	11.637	8	1.551	2.359	0.2260	0.6771	0.8387
*100	0.5313	0.6800	0.8205	0.7017	1.1503	17.496	8	3.118	2.359	0.2260	0.5313	0.6581

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.78826	1.035	0.08001	-0.1887
Bartlett's Test indicates equal variances (p = 0.17)	9.03074	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

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	0.20258	0.25022	0.11694	0.03672	0.01018	6, 49
Treatments vs CRS+CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	60.833	24.033	4.775	80.040	0.0365
IC10	69.444	21.722	9.551	84.008	-0.9383
IC15	78.056				
IC20	84.286				
IC25	89.821				
IC40	>100				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	03/24/2011	Test ID:	5069-03	Sample ID:	CRM1.5
End Date:	05/14/2011	Lab ID:	GLEC	Sample Type:	WHOLE SEDIMENT
Sample Date:	02/07/2011	Protocol:	EPA 600/R-99/064	Test Species:	Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS+CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS+CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.7500	1.0000	0.7500	0.6667	0.7500	0.3333	1.0000	1.0000
20	0.6667	0.8333	0.7500	0.7500	0.5000	0.8333	0.5833	0.8333
40	1.0000	0.7500	0.4167	1.0000	0.6667	0.7500	0.7500	0.6667
60	0.8333	0.5833	1.0000	0.5833	0.5833	0.8333	0.8333	0.5833
80	0.5833	0.6667	0.5833	0.7500	0.5833	0.5833	0.6667	0.5000
100	0.4167	0.5833	0.5000	0.5000	0.8333	0.5000	0.4167	0.5000

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS+CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8					
CRS+CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8				0.7813	1.0000
10	0.7813	1.0000	1.1238	0.6155	1.4260	25.576	8	-0.044	2.359	0.2426	0.7813	1.0000
20	0.7188	0.9200	1.0194	0.7854	1.1503	13.591	8	0.971	2.359	0.2426	0.7344	0.9400
40	0.7500	0.9600	1.0757	0.7017	1.4260	22.680	8	0.423	2.359	0.2426	0.7344	0.9400
60	0.7292	0.9333	1.0442	0.8691	1.4260	19.896	8	0.730	2.359	0.2426	0.7292	0.9333
80	0.6146	0.7867	0.9025	0.7854	1.0472	8.853	8	2.108	2.359	0.2426	0.6146	0.7867
*100	0.5313	0.6800	0.8205	0.7017	1.1503	17.496	8	2.905	2.359	0.2426	0.5313	0.6800

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.98518	1.035	0.0791	0.02932
Bartlett's Test indicates equal variances (p = 0.04)	12.9112	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

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	0.2188	0.27026	0.10365	0.04229	0.03757	6, 49
Treatments vs CRS+CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	18.333	23.572	3.143	67.771	0.4786
IC10	64.545	24.457	6.285	79.772	-0.3708
IC15	71.364				
IC20	78.182				
IC25	86.875				
IC40	>100				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Surv

Start Date:	3/24/2011	Test ID:	crm2.0cdem	Sample ID:	CRM 2.0
End Date:	5/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS + CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS + CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.9167	0.6667	0.5000	0.9167	0.7500	0.8333	1.0000	0.6667
20	1.0000	0.5833	0.9167	0.9167	0.6667	0.6667	0.5833	1.0000
40	0.8333	0.8333	0.8333	0.6667	0.3333	0.9167	1.0000	1.0000
60	1.0000	0.6667	0.8333	0.7500	0.4167	0.8333	0.9167	0.7500
80	1.0000	0.6667	0.7500	0.9167	0.5000	0.8333	0.7500	0.5833
100	0.8333	0.6667	0.7500	0.8333	0.5833	0.6667	0.9167	0.6667

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8					
CRS + CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8	*			0.7891	1.0000
10	0.7813	1.0000	1.1094	0.7854	1.4260	19.122	8	0.088	2.359	0.2635	0.7891	1.0000
20	0.7917	1.0133	1.1321	0.8691	1.4260	21.535	8	-0.115	2.359	0.2635	0.7891	1.0000
40	0.8021	1.0267	1.1439	0.6155	1.4260	23.176	8	-0.221	2.359	0.2635	0.7891	1.0000
60	0.7708	0.9867	1.0945	0.7017	1.4260	19.775	8	0.222	2.359	0.2635	0.7708	0.9769
80	0.7500	0.9600	1.0698	0.7854	1.4260	19.732	8	0.443	2.359	0.2635	0.7500	0.9505
100	0.7396	0.9467	1.0451	0.8691	1.2780	13.114	8	0.664	2.359	0.2635	0.7396	0.9373

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.53219	0.895	-0.1921	-0.6074
Bartlett's Test indicates equal variances (p = 0.78)	3.22014	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.23951	0.29584	0.0098	0.04992	0.97637	6, 49
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	80.750			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	3/24/2011	Test ID:	crm2.0cdem	Sample ID:	CRM 2.0
End Date:	5/14/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	CDIL-Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS + CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS + CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.8333	0.6667	0.4167	0.9167	0.7500	0.8333	1.0000	0.5833
20	1.0000	0.5833	0.9167	0.9167	0.6667	0.6667	0.5833	1.0000
40	0.8333	0.8333	0.8333	0.6667	0.2500	0.9167	1.0000	1.0000
60	1.0000	0.5000	0.6667	0.7500	0.4167	0.6667	0.9167	0.6667
80	1.0000	0.6667	0.7500	0.8333	0.5000	0.8333	0.7500	0.5000
100	0.8333	0.6667	0.7500	0.8333	0.5833	0.6667	0.9167	0.6667

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8					
CRS + CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8	*			0.7813	1.0000
10	0.7500	0.9600	1.0722	0.7017	1.4260	21.514	8	0.402	2.359	0.2758	0.7778	0.9956
20	0.7917	1.0133	1.1321	0.8691	1.4260	21.535	8	-0.110	2.359	0.2758	0.7778	0.9956
40	0.7917	1.0133	1.1324	0.5236	1.4260	25.777	8	-0.113	2.359	0.2758	0.7778	0.9956
60	0.6979	0.8933	1.0130	0.7017	1.4260	23.615	8	0.909	2.359	0.2758	0.7222	0.9244
80	0.7292	0.9333	1.0434	0.7854	1.4260	20.173	8	0.649	2.359	0.2758	0.7222	0.9244
100	0.7396	0.9467	1.0451	0.8691	1.2780	13.114	8	0.634	2.359	0.2758	0.7222	0.9244

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.55446	0.895	-0.1833	-0.2742
Bartlett's Test indicates equal variances (p = 0.71)	3.76385	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.25167	0.31085	0.01881	0.05467	0.90993	6, 49
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	52.813			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Survival

Start Date:	03/24/2011	Test ID:	5069-03	Sample ID:	CRM3.0
End Date:	05/14/2011	Lab ID:	GLEC	Sample Type:	WHOLE SEDIMENT
Sample Date:	02/08/2011	Protocol:	EPA 600/R-99/064	Test Species:	Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS+CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS+CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.8333	0.8333	0.7500	0.5000	0.7500	0.9167	0.9167	0.5000
20	0.7500	0.7500	0.8333	0.5833	0.6667	0.6667	0.6667	0.8333
40	0.7500	0.9167	0.7500	0.9167	0.6667	0.5000	0.8333	0.9167
60	0.6667	0.7500	0.7500	0.6667	0.5833	0.9167	0.5833	0.9167
80	0.8333	0.9167	0.8333	0.7500	0.6667	0.6667	0.5000	0.7500
100	0.7500	0.7500	0.7500	0.4167	0.6667	0.9167	1.0000	0.8333

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS+CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8					
CRS+CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8				0.7813	1.0000
10	0.7500	0.9600	1.0652	0.7854	1.2780	18.170	8	0.584	2.359	0.2184	0.7500	0.9600
20	0.7188	0.9200	1.0162	0.8691	1.1503	9.884	8	1.113	2.359	0.2184	0.7500	0.9600
40	0.7813	1.0000	1.1024	0.7854	1.2780	16.189	8	0.182	2.359	0.2184	0.7500	0.9600
60	0.7292	0.9333	1.0374	0.8691	1.2780	15.715	8	0.884	2.359	0.2184	0.7431	0.9511
80	0.7396	0.9467	1.0461	0.7854	1.2780	14.448	8	0.790	2.359	0.2184	0.7431	0.9511
100	0.7604	0.9733	1.0816	0.7017	1.4260	19.943	8	0.407	2.359	0.2184	0.7431	0.9511

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.52744	1.035	-0.1543	-0.5045
Bartlett's Test indicates equal variances (p = 0.41)	6.16162	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.19512	0.241	0.01078	0.03427	0.92629	6, 49
Treatments vs CRS+CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

ToxCalc v5.0.23

Reviewed by: DS

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	03/24/2011	Test ID:	5069-03	Sample ID:	CRM3.0
End Date:	05/14/2011	Lab ID:	GLEC	Sample Type:	WHOLE SEDIMENT
Sample Date:	02/08/2011	Protocol:	EPA 600/R-99/064	Test Species:	Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS+CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS+CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.8333	0.6667	0.7500	0.5000	0.6667	0.9167	0.8333	0.5000
20	0.5833	0.6667	0.8333	0.5833	0.5833	0.6667	0.6667	0.7500
40	0.6667	0.9167	0.7500	0.7500	0.6667	0.5000	0.7500	0.7500
60	0.6667	0.6667	0.7500	0.5833	0.5000	0.9167	0.5833	0.9167
80	0.8333	0.9167	0.8333	0.7500	0.5833	0.6667	0.5000	0.7500
100	0.7500	0.7500	0.7500	0.4167	0.5833	0.8333	1.0000	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+CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8					
CRS+CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8				0.7813	1.0000
10	0.7083	0.9067	1.0134	0.7854	1.2780	17.466	8	1.172	2.359	0.2132	0.7083	0.9067
20	0.6667	0.8533	0.9588	0.8691	1.1503	10.327	8	1.775	2.359	0.2132	0.7083	0.9067
40	0.7188	0.9200	1.0203	0.7854	1.2780	13.504	8	1.094	2.359	0.2132	0.7083	0.9067
60	0.6979	0.8933	1.0047	0.7854	1.2780	18.464	8	1.268	2.359	0.2132	0.7083	0.9067
80	0.7292	0.9333	1.0353	0.7854	1.2780	15.577	8	0.929	2.359	0.2132	0.7083	0.9067
100	0.7292	0.9333	1.0420	0.7017	1.4260	20.031	8	0.855	2.359	0.2132	0.7083	0.9067

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.89432	1.035	0.14079	-0.356
Bartlett's Test indicates equal variances (p = 0.36)	6.60176	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.19008	0.23479	0.0189	0.03266	0.74553	6, 49
Treatments vs CRS+CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05*	5.3571			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

* indicates IC estimate less than the lowest concentration

Chironomus dilutus Partial Life-cycle Test-Partial Life Cycle Survival

Start Date:	03/24/2011	Test ID:	5069-03	Sample ID:	CRM4.0
End Date:	05/14/2011	Lab ID:	GLEC	Sample Type:	WHOLE SEDIMENT
Sample Date:	02/08/2011	Protocol:	EPA 600/R-99/064	Test Species:	Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS+CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS+CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.7500	0.6667	0.7500	0.7500	0.7500	0.6667	0.6667	0.7500
20	0.7500	0.8333	0.7500	0.6667	0.7500	0.5000	0.6667	1.0000
40	0.8333	1.0000	0.6667	0.7500	0.6667	1.0000	0.7500	0.6667
60	0.8333	0.8333	0.6667	0.6667	0.7500	0.8333	0.7500	0.5000
80	0.9167	0.8333	0.5000	1.0000	0.6667	1.0000	0.5833	0.4167
100	0.7500	0.5833	0.5000	0.5000	0.8333	0.7500	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+CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8				
CRS+CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8			0.7813	1.0000
10	0.7188	0.9200	1.0127	0.9553	1.0472	4.695	8	60.00	46.00	0.7500	0.9600
20	0.7396	0.9467	1.0517	0.7854	1.4260	17.581	8	62.50	46.00	0.7500	0.9600
40	0.7917	1.0133	1.1203	0.9553	1.4260	17.855	8	69.00	46.00	0.7500	0.9600
60	0.7292	0.9333	1.0302	0.7854	1.1503	12.440	8	60.50	46.00	0.7344	0.9400
80	0.7396	0.9467	1.0740	0.7017	1.4260	26.644	8	65.00	46.00	0.7344	0.9400
100	0.6042	0.7733	0.8965	0.7017	1.1503	18.162	8	49.50	46.00	0.6042	0.7733

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.9266	1.035	0.2427	-0.4213
Bartlett's Test indicates unequal variances (p = 5.29E-03)	18.4059	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs CRS+CRW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	50.000	35.499	3.046	89.293	-0.1697
IC10	84.800				
IC15	90.800				
IC20	96.800				
IC25	>100				
IC40	>100				
IC50	>100				

Chironomus dilutus Partial Life-cycle Test-Emergence

Start Date:	03/24/2011	Test ID:	5069-03	Sample ID:	CRM4.0
End Date:	05/14/2011	Lab ID:	GLEC	Sample Type:	WHOLE SEDIMENT
Sample Date:	02/08/2011	Protocol:	EPA 600/R-99/064	Test Species:	Chironomus dilutus

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water; CRS=Clinch Reference Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS+CRW	0.6667	0.7500	0.8333	0.9167	0.9167	0.7500	0.5000	0.6667
CRS+CRW	1.0000	0.8333	0.8333	0.5000	0.5833	1.0000	0.5833	0.9167
10	0.7500	0.5833	0.7500	0.5833	0.7500	0.6667	0.6667	0.7500
20	0.7500	0.7500	0.6667	0.6667	0.7500	0.5000	0.6667	1.0000
40	0.7500	1.0000	0.6667	0.6667	0.6667	1.0000	0.7500	0.6667
60	0.8333	0.8333	0.6667	0.6667	0.7500	0.8333	0.7500	0.5000
80	0.8333	0.8333	0.5000	1.0000	0.5833	1.0000	0.5833	0.4167
100	0.7500	0.5833	0.5000	0.5000	0.8333	0.7500	0.4167	0.5000

			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS+CRW	0.7500	0.9600	1.0621	0.7854	1.2780	15.946	8					
CRS+CRW	0.7813	1.0000	1.1193	0.7854	1.4260	22.699	8				0.7813	1.0000
10	0.6875	0.8800	0.9797	0.8691	1.0472	8.080	8	1.420	2.359	0.2317	0.7266	0.9300
20	0.7188	0.9200	1.0274	0.7854	1.4260	17.803	8	0.935	2.359	0.2317	0.7266	0.9300
40	0.7708	0.9867	1.0959	0.9553	1.4260	18.942	8	0.237	2.359	0.2317	0.7266	0.9300
60	0.7292	0.9333	1.0302	0.7854	1.1503	12.440	8	0.907	2.359	0.2317	0.7266	0.9300
80	0.7188	0.9200	1.0472	0.7017	1.4260	26.997	8	0.733	2.359	0.2317	0.7188	0.9200
100	0.6042	0.7733	0.8965	0.7017	1.1503	18.162	8	2.268	2.359	0.2317	0.6042	0.7733

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.605	1.035	0.41994	-0.3127
Bartlett's Test indicates equal variances (p = 0.06)	12.2141	16.8119		
The control means are not significantly different (p = 0.60)	0.52967	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.20819	0.25715	0.04394	0.0386	0.35461	6, 49
Treatments vs CRS+CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05*	7.143			
IC10	82.727			
IC15	89.545			
IC20	96.364			
IC25	>100			
IC40	>100			
IC50	>100			

* indicates IC estimate less than the lowest concentration

Appendix F
Hyalella azteca
28-Day Statistical Data

- Survival
- Weight

GLEC
Great Lakes Environmental Center

Hyalella azteca WEIGHT DATA

TEST MATERIAL: TVA - Day Ø

TEST NUMBER: 5009 03

TECHNICIAN'S INITIALS: Rme

WEIGH DATE: 3/25/11

TEST DATE: day Ø: 3/22/11 1600 - out 3/23/11 1600

DRYING DURATION (HOURS): 24 HRS

TYPE/MODEL OF DRYING OVEN: BLUE M

OVEN TEMPERATURE (°C): 60

TEST SPECIES: *H. azteca*

TREATMENT LEVEL	REP. NUMBER	A DRY WEIGHT OF PAN AND ORGANISMS (g)	B DRY WEIGHT OF PANS (g)	A-B TOTAL DRY WEIGHT OF ORGANISMS (g)	C NUMBER OF ORGANISMS WEIGHED	A-B/C AVERAGE WEIGHT (mg)	Biomass (mg)
Day Ø H. azteca	1	0.79537	0.79389	0.00148	80	0.01850	
	2						
	3						
	4						
	5						
	6						
	7						
	8						

TVA: 5069-
Clinch River

Sample ID:
Concentration:
QC'd by: NW

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Boardman Sediment Lab Control (LCS)	Test Photoperiod: 16:8
Sample ID: LCS + GLW--Sediment Lab Control	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: ~~2~~ 1 NW 8/16/11
Date: 4/19/11	☑ 7:00 renewal time/Initials ☐ / renewal time/Initials
Overlying Water: Dechlor	☐ / renewal time/Initials ☐ / renewal time/Initials
Overlying Water Batch ID (GLC Number): Dechlor Chems DS 7/15	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate NW
1	22.6	7.76	6.7	310	132	110	~~0.27~~ 0.00 NA 8/16/11	10/10
2	22.6	7.87	6.4	327	end: 35.2	end: 6.3		10/10
3					start: ~~8.6~~ 31.9 (28) 8/16/11	start: 0.8		10/10
4					Titrant used (mL): 33	Titrant used (mL): 5.5		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-...
Clinch River

Sample ID:
Concentration:
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: Dechlor water (GLW) with Silica Sand
Sample ID: GLW-Water only exposure
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: Dechlor
Overlying Water Batch ID (GLC Number): Dechlor
Chems DS 7.15

Number Daily Renewals: ~~2~~ 1 [illegible]
☑ 1200 renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.6	7.96	7.5	300	128	104	0.27	8/10
2	22.6	7.95	7.8	306	end: 38.4	end: 11.5	0.00 ~~0.27~~ 8/10/11	9/10
3					start: 35.2	start: 6.3		10/10
4					Titrant used (mL): 3.2	Titrant used (mL): 5.2		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NO			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID:
Concentration:
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: Site water (CRW 7.0) with Boardman Sediment Lab Control (LCS)
Sample ID: LCS + CRW
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chems DS 7/15

Number Daily Renewals: ~~2~~ 1 [illegible] 8/10/11
☑ 7:30 AM renewal time/Initials ☐ / renewal time/Initials
☐ / renewal time/Initials ☐ / renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate [illegible]
1	22.9	7.68	6.3	309	136	124	(-0.21)u	10/10
2	22.5	7.81	5.9	311	end: 34.6	end: 15.0	0.00u	10/10
3					start: 31.2	start: 8.8		9/10
4					Titrant used (mL): 3.4	Titrant used (mL): 6.2		8/10
5					Sample volume (mL): 25	Sample volume (mL): 50		9/10
6					(ND)			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID:
Concentration:
QC'd by: DMW

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8897
Sample ID: CRS- CRM 7.0 (Clinch Reference)
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chems ⊗ DS 7/5

Number Daily Renewals: 2 1 MW 8/16/11
☑ renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MW
1	22.6	8.10	7.5	316	120	122	0.17 MW	9/10
2	22.6	8.17	7.1	311	end: 31.2	end: 8.8	MW 8/16/11	8/10
3					start: 28.2	start: 2.7		10/10
4					Titrant used (mL): 3.0	Titrant used (mL): 6.1		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		9/10
6					(10)			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-...
Clinch River

Sample ID: CRM 1.5
Concentration: 10%
QC'd by: NW

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8889
Sample ID: CRM 1.5 Concentration: 10%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chems DS 7:15

Number Daily Renewals: 2 | NW 8/10/11
☑ 7:30/10 renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate NW
1	22.5	8.18	6.7	319	144	126	(-0.21)u 0.00	10/10
2	22.6	8.18	7.1	317	end: 38.2	end: 21.3		8/10
3					start: 34.6	start: 15.0		8/10
4					Titrant used (mL): 3.6	Titrant used (mL): 6.3		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 1.5
Concentration: 20%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: 2 | [illegible] 8 | [illegible]
Date: 4/19/11	☑ 7:00 renewal time/Initials ☐ ✓ renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ ✓ renewal time/Initials ☐ ✓ renewal time/Initials
Overlying Water Batch ID (GLC Number): 8938	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Chems DS 7:15	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.6	8.14	7.1	311	136	124	(-0.24)u	10/10
2	22.6	8.15	7.0	316	end: 41.6	end: 27.5	0.00	8/10
3					start: 38.2	start: 21.3		8/10
4					Titrant used (mL): 3.4	Titrant used (mL): 6.2		9/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					DS			7/10
7								9/10
8								10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

5/3/11 - 10% QC ✓ against data in Excel - EB

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 1.5
Concentration: 40%
QC'd by: nw

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8889
Sample ID: CRM 1.5 Concentration: 40%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chen DS 7.15

Number Daily Renewals: ~~2~~ 1 nw 8/16/11
☑ 7:00 renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate NAV
1	22.6	8.13	7.0	314	136	124	(-0.27) U	10/10
2	22.5	8.18	7.1	310	end: 45.0	end: 33.7	0.00	10/10
3					start: 41.6	start: 27.5		8/10
4					Titrant used (mL): 3.4	Titrant used (mL): 6.2		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		7/10
6					(25)			8/10
7								10/10
8								9/10

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-05
Clinch River

Sample ID: CRM 1.5
Concentration: 60%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8889
Sample ID: CRM 1.5 Concentration: 60%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chems DS 7:15

Number Daily Renewals: ~~2~~ 1 [illegible] 8/16/11
☑ 7:00 renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials
Food: YTC# N/A ☑ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate [illegible]
1	22.6	8.13	6.9	312	152	122	(-0.27) u	10/10
2	22.6	8.17	7.2	308	end: 4.1	end: 39.8	0.00	10/10
3					start: 0.3	start: 33.7		10/10
4					Titrant used (mL): 3.8	Titrant used (mL): 6.1		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		[illegible] 8/16/11 ~~8~~ 10/10
6					(NS)			8/10
7								7/10
8								7/10

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 1.5
Concentration: 80%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8889
Sample ID: CRM 1.5 Concentration: 80%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chem: DS 7:15

Number Daily Renewals: 7 | [illegible] 8/16/11
☑ 730 [illegible] renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.5	8.16	7.6	294.7	132	122	0.00 (-0.26)	8/10
2	22.6	8.10	7.4	305	end: 7.4	end: 45.9	Duplicate	8/10
3					start: 4.1	start: 39.8	-0.27 0.00	8/10
4					Titrant used (mL): 3.3	Titrant used (mL): 6.1		8/10
5					Sample volume (mL): 25	Sample volume (mL): 50		9/10
6					NS			9/10
7								8/10
8								8/10

Alk-duplicate
end: 11.6
start: 6.0
used: 5.6
112
Hard: Duplicate
NS
end: 3.5
start: 0.2
used: 3.3
132

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 1.5
Concentration: 100%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8889	Test Photoperiod: 16:8
Sample ID: CRM 1.5 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: ~~2~~ 1 [illegible] 8/16/11
Date: 4/19/11	☑ 7:00 renewal time/Initials ☐ / renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ / renewal time/Initials ☐ / renewal time/Initials
Overlying Water Batch ID (GLC Number): 8938	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
0.5 7:15 [illegible]	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate [illegible]
1	22.6	8.13	7.2	307	140	118	(-0.27) 0.00	8/10
2	22.6	8.11	7.2	305	end: 10.9	end: 7.2		9/10
3					start: 7.4	start: ~~15.9~~ 1.3 (OK 8/17/11)		9/10
4					Titrant used (mL): 3.5	Titrant used (mL): 5.9		9/10
5					Sample volume (mL): 25	Sample volume (mL): 50		9/10
6					(NS)			9/10
7								9/10
8								10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-..
Clinch River

Sample ID: CRM 2.5
Concentration: 10%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8892
Sample ID: CRM 2.5 Concentration: 10%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chem DS 7115

Number Daily Renewals: ~~2~~ 1 8/17/11
☒ 730 renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☐ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.6	8.21	7.2	316	136	126	(-0.27)u	9/10
2	22.6	8.25	7.3	320	end: 14.3	end: 13.5	0.00	8/10
3					start: 10.9	start: 7.2		10/10
4					Titrant used (mL): 3.4	Titrant used (mL): 6.3		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 2.5
Concentration: 20%
QC'd by: [redacted]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8892
Sample ID: CRM 2.5 Concentration: 20%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
DS 7115 chens

Number Daily Renewals: 2 8/17/11
☒ 7:30 renewal time/Initials ☐ / renewal time/Initials
☐ / renewal time/Initials ☐ / renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.6	8.22	7.1	321	148	126	(-0.27) 0.00	10/10
2	22.6	8.21	7.2	316	end: 18.0	end: 19.8		10/10
3					start: 14.3	start: 13.5		10/10
4					Titrant used (mL): 3.7	Titrant used (mL): 6.3		8/10
5					Sample volume (mL): 25	Sample volume (mL): 50		9/10
6					NS			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 2.5
Concentration: 40%
QC'd by: [redacted]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8892
Sample ID: CRM 2.5 Concentration: 40%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chems DS 7/15

Number Daily Renewals: ~~2~~ 1 8/17/11
☑ 730 00 renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.6	8.21	7.5	315	136	122	(0.27) 0.00	10/10
2	22.7	8.15	7.0	316	end: 21.4	end: 25.9		10/10
3					start: 18.0	start: 19.8		9/10
4					Titrant used (mL): 3.4	Titrant used (mL): 6.1		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		8/10
6					NS			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

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.

5/13/11 - 10% QC ✓ against data in Excel - EB

TVA: 5069-03
Clinch River

Sample ID: CRM 2.5
Concentration: 60%
QC'd by: [illegible]

[redacted]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8892	Test Photoperiod: 16:8
Sample ID: CRM 2.5 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: ~~2~~ 1 [illegible] 8/n/11
Date: 4/19/11	☑ 7:30pm renewal time/Initials ☐ renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ renewal time/Initials ☐ renewal time/Initials
Overlying Water Batch ID (GLC Number): 8938	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Chem DS 7/15	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate [illegible]
1	22.7	8.03	6.9	315	144	120	(-0.27) a	10/10
2	22.6	8.06	6.8	306	end: 25.0	end: 31.9	0.00	9/10
3					start: 21.4	start: 25.9		10/10
4					Titrant used (mL): 3.6	Titrant used (mL): 6.0		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		9/10
6					(NS)			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 2.5
Concentration: 80%
QC'd by: [redacted]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8892
Sample ID: CRM 2.5 Concentration: 80%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chems DS 7/15

Number Daily Renewals: ~~2~~ 1 8/17/11
☑ 7300 renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N17 ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.6	8.03	7.1	308	156	120	(-0.27) 0.00	9/10
2	22.6	8.11	7.2	309	end: 28.9	end: 38.0		10/10
3					start: 25.0	start: 32.0		10/10
4					Titrant used (mL): 3.9	Titrant used (mL): 6.0		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NB			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 2.5
Concentration: 100%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8892
Sample ID: CRM 2.5 Concentration: 100%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8938
Chems DS 7:15

Number Daily Renewals: ~~2~~ 1 [illegible] 8/17/11
☑ 7:00 renewal time/Initials ☐ ✓ renewal time/Initials
☐ ✓ renewal time/Initials ☐ ✓ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate [illegible]
1	22.6	8.08	7.2	306	120	124	(0.26) [illegible]	10/10
2	22.6	8.18	7.1	318	end: 31.9	end: 44.2	0.00	10/10
3					start: 28.9	start: 38.0		8/10
4					Titrant used (mL): 3.0	Titrant used (mL): 6.2		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					(NS)			9/10
7								10/10
8								9/10

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 3.0
Concentration: 10%
QC'd by: Mur

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8893
Sample ID: CRM 3.0 Concentration: 10%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8926 38
Chems DS 7:15 NWS 8/17/11

Number Daily Renewals: ~~Day 5~~ 8/17/11
☒ D 5 renewal time/Initials ☐ / renewal time/Initials
☒ 7300 renewal time/Initials ☐ / renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate
1	22.6	8.19	7.7	321	140	122	~~0.27~~ 0.20	9/10
2	22.6	8.18	7.6	321	end: 22.5	end: 1.4		10/10
3					start: 19.0	start: 0.8		10/10
4					Titrant used (mL): 3.5	Titrant used (mL): 6.1		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6								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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 3.0
Concentration: 20%
QC'd by: MWS

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8893
Sample ID: CRM 3.0 Concentration: 20%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8928 3.8 MWS 8/17/11
Chem DS 7:15

Number Daily Renewals: ~~2~~ 1 MWS 8/17/11
☑ 7:00 renewal time/Initials ☐ — renewal time/Initials
☐ — renewal time/Initials ☐ — renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MWS
1	22.7	8.24	7.8	312	136	122	~~0.27~~ 0.00	10/10
2	22.7	8.30	7.7	314	end: 25.9	end: 13.0		10/10
3					start: 225	start: 6.9		10/10
4					Titrant used (mL): 3.4	Titrant used (mL): 6.1		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		8/10
6					(NS)			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 3.0
Concentration: 40%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8893
Sample ID: CRM 3.0 Concentration: 40%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 992838
CH ems DS 7:15 [illegible] 8/17/11

Number Daily Renewals: ~~2~~ 1 [illegible] 8/17/11
☒ renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MCS
1	22.7	8.22	7.5	314	132	120	(0.27)U 0.00	10/10
2	22.6	8.18	7.4	311	end: 29.2	end: 19.0		10/10
3					start: 25.9	start: 13.0		10/10
4					Titrant used (mL): 3.3	Titrant used (mL): 6.6		10/10
5					Sample volume (mL): 25 (15)	Sample volume (mL): 50		10/10
6								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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 3.0
Concentration: 60%
QC'd by: MW

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 60%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: 21 MW 8/17/11
Date: 4/19/11	☑ 7300 renewal time/Initials ☐ / renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ / renewal time/Initials ☐ / renewal time/Initials
Overlying Water Batch ID (GLC Number): 8928.38	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Chems DS 7:15 MW 8/17/11	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MS
1	22.6	8.08	7.4	304	136	122	(-0.26) U 0.00	10/10
2	22.6	8.01	7.4	302	end: 32.6	end: 25.3		10/10
3					start: 29.2	start: 19.2		10/10
4					Titrant used (mL): 3.4	Titrant used (mL): 6.1		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					(NS)			9/10
7								10/10
8								5/10

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

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.

TVA: 5069-03
Clinch River

Sample ID: CRM 3.0
Concentration: 80%
QC'd by: MWS

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8893
Sample ID: CRM 3.0 Concentration: 80%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8928 38
Chem 5 DS 7:15 RWO 8/17/11

Number Daily Renewals: 2 / MWS 8/17/11
☑ 7:00 renewal time/Initials ☐ / renewal time/Initials
☐ / renewal time/Initials ☐ / renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MWS
1	22.6	7.94	7.2	301	132	124	(-0.26)U	9/10
2	22.7	7.99	7.2	299.9	end: 35.9	end: 31.5	0.00	8/10
3					start: 32.6	start: 25.3		10/10
4					Titrant used (mL): 3.3	Titrant used (mL): 6.2		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			10/10
7								8/10
8								10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 3.0
Concentration: 100%
QC'd by: MWS

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8893	Test Photoperiod: 16:8
Sample ID: CRM 3.0 Concentration: 100%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: ~~2~~ 1 MWS 8/17/11
Date: 4/19/11	~~0730~~ renewal time/Initials ☐ / renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ / renewal time/Initials ☐ / renewal time/Initials
Overlying Water Batch ID (GLC Number): 8928 38 MWS 8/17/11	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Chems DS 7/15	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MWS
1	22.6	7.93	7.2	299.2	128	126	0.00 (-0.26)	10/10
2	22.6	7.97	7.5	298.3	end: 39.1	end: 37.8	Duplicate (-0.27) 0.00	10/10
3					start: 35.9	start: 31.5		10/10
4					Titrant used (mL): 3.2	Titrant used (mL): 6.3		10/10
5					Sample volume (mL): 25 (NS)	Sample volume (mL): 50		9/10
6								10/10
7								9/10
8								10/10

Alk duplicate
end: 23.4
start: 17.6
used: 5.8
116

Hard duplicate
(NS)
end: 10.5
start: 7.2
used: 3.3
132

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 4.5
Concentration: 10%
QC'd by: MWR

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8896
Sample ID: CRM 4.5 Concentration: 10%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 89~~20~~38
Chems DS 7:19 MWR 8/17/11

Number Daily Renewals: ~~2~~ 1 MWR 8/17/11
☑ 7:30 b renewal time/Initials ☐ ✓ renewal time/Initials
☐ ✓ renewal time/Initials ☐ ✓ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MWS
1	22.6	8.19	6.7	318	140	124	(-0.27) U 0.00	9/10
2	22.7	8.19	7.0	317	end: 41.9	end: 12.7		10/10
3					start: 38.4	start: 11.5		10/10
4					Titrant used (mL): 3.5	Titrant used (mL): 6.2		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 4.5
Concentration: 20%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8896	Test Photoperiod: 16:8
Sample ID: CRM 4.5 Concentration: 20%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: 21 [illegible] 8/17/11
Date: 4/19/11	☑ 7:00 renewal time/Initials ☐ / renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ / renewal time/Initials ☐ / renewal time/Initials
Overlying Water Batch ID (GLC Number): 8929 B8	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Chems DS 7:15 [illegible] 8/17/11	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate NS
1	22.7	8.19	7.3	318	152	120	(0.03 / -0.38)	9/10
2	22.7	8.20	7.4	310	end: 4.2	end: 23.7	Duplicate	10/10
3					start: 0.4	start: 17.7	(-0.28 / 0.30)	10/10
4					Titrant used (mL): 3.8	Titrant used (mL): 6.0		9/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					(NS)			10/10
7								10/10
8								10/10

Alk: duplicate
end: 17.6
start: 11.8
used: 5.8
116

Hard: Duplicate
(NS)
end: 7.2
start: 3.5
used: 3.7
148

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-v3
Clinch River

Sample ID: CRM 4.5
Concentration: 40%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8896	Test Photoperiod: 16:8
Sample ID: CRM 4.5 Concentration: 40%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: ~~2~~ 1 [illegible]
Date: 4/19/11	☑ renewal time/Initials ☐ renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ renewal time/Initials ☐ renewal time/Initials
Overlying Water Batch ID (GLC Number): 8928 38	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Chem S DS 7115 [illegible]	Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate NAV
1	22.7	8.15	7.1	317	144	118	(-0.28) 0.00	9/10
2	22.7	8.14	6.9	315	end: 7.8	end: 29.6		8/10
3					start: 4.2	start: 23.7		10/10
4					Titrant used (mL): 3.6	Titrant used (mL): 5.9		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			10/10
7								10/10
8								4/10

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

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.

TVA: 5069-v3
Clinch River

Sample ID: CRM 4.5
Concentration: 60%
QC'd by: MWP

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8896
Sample ID: CRM 4.5 Concentration: 60%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8/2038 MWP 8/17/11
Chems DS 7115

Number Daily Renewals: ~~2~~ 1 MWP 8/17/11
☑ 30 cm renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# 3/p ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate MS
1	22.6	8.17	7.2	316	144	118	(-0.30)U 0.00	10/10
2	22.6	8.10	7.2	312	end: 11.4	end: 35.5		10/10
3					start: 7.8	start: 29.6		10/10
4					Titrant used (mL): 3.6	Titrant used (mL): 5.9		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			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.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

TVA: 5069-03
Clinch River

Sample ID: CRM 4.5
Concentration: 80%
QC'd by: Mu

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8896	Test Photoperiod: 16:8
Sample ID: CRM 4.5 Concentration: 80%	Test System: 175mL Manual Delivery
Test Species: *Hyalella azteca*	Test Temperature: 23± 1°C
Date Addition of Sediment: 3/21/11	Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Initiation Date: 3/22/11	Test Termination Date: 4/19/11

Test Day: Day 28	Number Daily Renewals: ~~2~~ 1 Mur 8/17/11
Date: 4/19/11	☒ ~~7:30~~ renewal time/Initials ☐ renewal time/Initials
Overlying Water: CRM 7.0 Site Water	☐ renewal time/Initials ☐ renewal time/Initials
Overlying Water Batch ID (GLC Number): 8928.38	Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Chems DS 7:15 Mur 8/17/11	Screens Cleaned: ☐ yes ☒ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate Mur
1	22.7	8.09	7.1	318	156	118	(-0.27) 0.00	10/10
2	22.7	8.11	7.0	315	end: 15.3	end: 41.5		10/10
3					start: 11.4	start: 35.6		6/10
4					Titrant used (mL): 3.9	Titrant used (mL): 5.9		9/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					(NS)			10/10
7								9/10
8								9/10

* 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 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

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.

TVA: 5069-03
Clinch River

Sample ID: CRM 4.5
Concentration: 100%
QC'd by: [illegible]

Hyalella azteca 28-Day Survival and Growth Whole Sediment Toxicity Test

GLC#: 8896
Sample ID: CRM 4.5 Concentration: 100%
Test Species: *Hyalella azteca*
Date Addition of Sediment: 3/21/11
Test Initiation Date: 3/22/11

Test Photoperiod: 16:8
Test System: 175mL Manual Delivery
Test Temperature: 23± 1°C
Test Organism Source/Age: In House 3/18/2011 5-6 days
Test Termination Date: 4/19/11

Test Day: Day 28
Date: 4/19/11
Overlying Water: CRM 7.0 Site Water
Overlying Water Batch ID (GLC Number): 8928 38
Chems DS 7:15 [illegible] 8/17/11

Number Daily Renewals: ~~2~~ 1 [illegible] 8/17/11
☑ 7:30 renewal time/Initials ☐ renewal time/Initials
☐ renewal time/Initials ☐ renewal time/Initials
Food: YTC# N/A ☐ Feed 1.0 ml/replicate
Screens Cleaned: ☐ yes ☑ no ☐ n/a

Replicate	Temperature (23± 1°C)*	pH	Dissolved Oxygen (mg/L)*	Specific (µmhos/cm)	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$	Ammonia (as N)	Observations/ 10 organisms per replicate [illegible]
1	22.6	8.10	6.5	326	148	118	(-0.27) 0.00	10/10
2	22.6	8.05	6.7	319	end: 19.0	end: 47.4		10/10
3					start: 15.3	start: 41.5		10/10
4					Titrant used (mL): 3.7	Titrant used (mL): 5.9		10/10
5					Sample volume (mL): 25	Sample volume (mL): 50		10/10
6					NS			9/10
7								9/10
8								10/10

* Contact Laboratory Coordinator if Dissoved Oxygen level is < 2.5 mg/L or Temperature is out of range.
*Alkalinity, hardness and ammonia analyzed from a composite sample of all 8 replicates.
*If DO declines by more thatn 1.0 mg/L since previous measurement, then measure daily.

KEY: AV: Animals Visible
NAV: No Animals Visible
FOV: Foreign Organism Visible

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.

Relative % Difference: RPD ≤15%

$$RPD = \left| \frac{(s_1 - s_2)}{(s_1 + s_2)/2} \right| \times 100 =$$

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: LCS + GLW

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M
AE 240: Scale

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/11 1130
Date/Time out: 4/20/11 1130

Dessicator
Date/Time in: 4/20/11 1130
Date/Time out: 4/20/11 1230

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 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:	1	10	0.81218	0.80802	0.00416	10	0.41600	0.41600
LCS + GLW	2	10	0.81470	0.81054	0.00416	10	0.41600	0.41600
GLEC Number:	3	10	0.82082	0.81599	0.00483	10	0.48300	0.48300
	4	10	0.82461	0.81990	0.00471	10	0.47100	0.47100
	5	10	0.82882	0.82297	0.00585	10	0.58500	0.58500
	6	10	0.82192	0.81790	0.00402	10	0.40200	0.40200
	7	10	0.82491	0.82078	0.00413	10	0.41300	0.41300
	8	10	0.82275	0.81915	0.00360	10	0.36000	0.36000
						AVERAGE:	0.44325	0.44325

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: GLW only

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/11 1130
Date/Time out: 4/20/11 1130

Dessicator
Date/Time in: 4/20/11 1130
Date/Time out: 4/20/11 1245

QC'd by: MJS

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: GLW only GLEC Number:	1	10	0.82255	0.82132	0.00123	8	0.15375 ~~0.15400~~	0.12300
	2	10	0.81882	0.81672	0.00210	9	0.23333	0.21000
	3	10	0.82100	0.81879	0.00221	10	0.22100	0.22100
	4	10	0.82272	0.81945	0.00327	10	0.32700	0.32700
	5	10	0.82544	0.82283	0.00261	10	0.26100	0.26100
	6	10	0.82566	0.82350	0.00216	10	0.21600 ~~0.21600~~	0.21600
	7	10	0.82531	0.82293	0.00238	10	0.23800	0.23800
	8	10	0.82752	0.82479	0.00273	10	0.27300	0.27300
						AVERAGE:	0.24039	~~0.23363~~ 0.23363

* new for EB 8/25/11

NS 4/25

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: LCS + CRW

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/11 1130
Date/Time out: 4/20/11 1130

Dessicator
Date/Time in: 4/20/11 1130
Date/Time out: 4/20/11 1310

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: LCS + CRW GLEC Number:	1	10	0.80711	0.80264	0.00447	10	0.44700	0.44700
	2	10	0.82020	0.81668	0.00352	10	0.35200	0.35200
	3	10	0.81877	0.81455	0.00422	9	0.46889	0.42200
	4	10	0.83555	0.83225	0.00330	8	0.41250	0.33000
	5	10	0.83465	0.83026	0.00439	9	0.48778	0.43900
	6	10	0.83266	0.82887	0.00379	9	0.42111	0.37900
	7	10	0.82877	0.82424	0.00453	10	0.45300	0.45300
	8	10	0.81209	0.80820	0.00389	10	0.38900	~~0.30900~~ 0.38900
						AVERAGE:	0.42891	0.40138

MWS 8/25/11

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRS+(CRM7.0) CRW

Test Species: *H. azteca* _____

Type/Model of Drying Oven: Blue M

Scale: QE210

Project Name: _____

Weigh Date: 4/20/11

Tenesee Valley Authority

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~24 hrs

Date/Time in: 4/19/11 1130

Date/Time out: 4/20/11 1130

Dessicator

Date/Time in: 4/20/11 1130

Date/Time out: 4/20/11 1300

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: CRS+CRW (CRM7.0) GLEC Number: 8897	1	~~9~~ 10	0.81699	0.81382	0.00317	9	0.35222	0.31700
	2	10	0.80400	0.80120	0.00280	~~10~~ 8 (EB)	0.35000	0.28000
	3	10	0.82667	0.82353	0.00314	10	0.31400	0.31400
	4	10	0.81153	0.80910	0.00243	10	0.24300	0.24300
	5	10	0.81272	0.80981	0.00291	~~10~~ 9 (EB)	0.32333	0.29100
	6	10	0.83683	0.83380	0.00303	10	0.30300	0.30300
	7	10	0.82574	0.82343	0.00231	~~10~~ 9 (EB)	0.25667	0.23100
	8	10	0.81433	0.81028	0.00405	~~10~~ 8 (EB)	0.50625	0.40500
						AVERAGE:	0.33106	0.29800

(EB) mwb for CRS 8/25/11

GLEC
Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: ~~LCS + CRM~~ CRM 1.5 10%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

SCALE: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/11 1130
Date/Time out: 4/20/11 1130

Dessicator
Date/Time in: 4/20/11 1130
Date/Time out: 4/20/11 1300

QC'd by: MW

mw for EB 8/25/11

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: ~~LCS + CRM~~ CRM 1.5 ~~CRM~~ GLEC Number: 8889 10%	1	10	0.80981	0.80747	0.00234	10	0.23400	0.23400
	2	10	0.80803	0.80568	0.00235	8	0.29375 ~~0.23500~~	0.23500
	3	10	0.80340	0.80167	0.00173	8	0.21625 ~~0.17~~	0.17300
	4	10	0.80658	0.80408	0.00250	10	0.25000	0.25000
	5	10	0.81062	0.80817	0.00245	10	0.24500	0.24500
	6	10	0.80711	0.80464	0.00247	10	0.24700	0.24700
	7	10	0.80969	0.80676	0.00293	10	0.29300	0.29300
	8	10	0.81402	0.81056	0.00346	10	0.34600	0.34600
						AVERAGE:	0.26563	0.25288

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 1.5 20%

Project Name: Tenesee Valley Authority

Technician's Initials: AB

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/11 1130

Date/Time out: 4/20/11 1130

Test Species: *H. azteca*

Weigh Date: 4/20/11

Test Date: 3/22/11-4/19/11

Dessicator

Date/Time in: 4/20/11 1130

Date/Time out: 4/20/11 1330

Type/Model of Drying Oven: Blue M

Scale: AE 240

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 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: CRM 1.5 20% GLEC Number: 8889	1	10	0.82752	0.82465	0.00287	10	0.28700	0.28700
	2	10	0.82728	0.82472	0.00256	8	0.32000	0.25600
	3	10	0.82802	0.82520	0.00282	8	0.35250	0.28200
	4	10	0.81896	0.81639	0.00257	9	0.28556	0.25700
	5	10	0.81728	0.81431	0.00297	10	0.29700	0.29700
	6	10	0.82731	0.82490	0.00241	7	0.34429	0.24100
	7	10	0.81260	0.80957	0.00303	9	0.33667	0.30300
	8	10	0.80500	0.80265	0.00235	10	0.23500	0.23500
						AVERAGE:	0.30725	0.26975

GLEC
Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 1.5 40%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~24 hrs
Date/Time in: 4/19/11 1130
Date/Time out: 4/20/11 1130

Dessicator
Date/Time in: 4/20/11 1130
Date/Time out: 4/20/11 1340

QC'd by: MWO

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: CRM 1.5 40% GLEC Number: 8889	1	10	0.80486	0.80227	0.00259	10	0.25900	0.25900
	2	10	0.80909	0.80693	0.00216	10	0.21600	0.21600
	3	10	0.82881	0.82655	0.00226	8	0.28250	0.22600
	4	10	0.80628	0.80407	0.00221	10	0.22100	0.22100
	5	10	0.81720	0.81504	0.00216	7	0.30857	0.21600
	6	10	0.81596	0.81380	0.00216	8	0.27000	0.21600
	7	10	0.81353	0.81138	0.00215	10	0.21500	0.21500
	8	10	0.83062	0.82840	0.00222	9	0.24667	0.22200
						AVERAGE:	0.25234	0.22388

GLEC

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 1.5 60%

Project Name: Tenesee Valley Authority

Technician's Initials: AS

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/11 1130

Date/Time out: 4/20/11 1130

Test Species: *H. azteca*

Weigh Date: 4/20/11

Test Date: 3/22/11-4/19/11

Dessicator

Date/Time in: 4/20/11 1130

Date/Time out: 4/20/11 1350

Type/Model of Drying Oven: Blue M

Scale: AE 240

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 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: CRM 1.5 60% GLEC Number: 8889	1	10	0.81505	0.81220	0.00285	10	0.28500	0.28500
	2	10	0.81854	0.81625	0.00229	10	0.22900	0.22900
	3	10	0.84353	0.84133	0.00220	10	0.22000	0.22000
	4	10	0.81541	0.81288	0.00253	10	0.25300	0.25300
	5	10	RS 8/20/11 0.879930	0.79672	0.00258	10	0.25800	0.25800
	6	10	0.84272	0.84017	0.00255	8	0.31875	0.25500
	7	10	0.81763	0.81585	0.00178	7	0.25429	0.17800
	8	10	0.82328	0.82180	0.00148	7	~~0.098~~ 0.21143	0.14800
						AVERAGE:	0.25368	0.22825

mwj for es 8/25/11

GLEC

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 1.5 80%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~24 hrs

Date/Time in: 4/19/11 1130

Date/Time out: 4/20/11 1130

Dessicator

Date/Time in: 4/20/11 1130

Date/Time out: 4/20/11 1400

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: CRM1.5 80% GLEC Number: 8889	1	10	0.79792	0.79544	0.00248	8	0.31000	0.24800
	2	10	0.80021	0.79837	0.00184	8	0.23000	0.18400
	3	10	0.82742	0.82573	0.00169	8	0.21125	0.16900
	4	10	0.80994	0.80795	0.00199	8	0.24875	0.19900
	5	10	0.82662	0.82451	0.00211	9	0.23444	0.21100
	6	10	0.83017	0.82785	0.00232	9	0.25778	0.23200
	7	10	0.83090	0.82918	0.00172	8	0.21500	0.17200
	8	10	0.82868	0.82739	0.00129	8	0.16125	0.12900
						AVERAGE:	0.23356	0.19300

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 1.5 100%

Test Species: *H. azteca* _____

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: _____

Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/11 1130

Date/Time out: 4/20/11 1130

Dessicator

Date/Time in: 4/20/11 1130

Date/Time out: 4/20/11 1410

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: CRM 1.5 100% GLEC Number: 8889	1	10	0.81850	0.81669	0.00181	8	0.22625	0.18100
	2	10	0.81817	0.81588	0.00229	9	0.25444	0.22900
	3	10	0.81105	0.80913	0.00192	9	0.21333	0.19200
	4	10	0.81575	0.81358	0.00217	9	0.24111	0.21700
	5	10	0.81770	0.81579	0.00191	9	0.21222	0.19100
	6	10	~~0.83017~~ 0.81773	0.81543	0.00230	9	0.25556	0.23000
	7	10	~~0.83040~~ 0.82549	~~0.82418~~ 0.82337	0.00212	9	~~0.00236~~ 0.23556	0.21200
	8	10	0.80990	0.80787	0.00203	10	0.20300	0.20300
						AVERAGE:	0.23018	~~0.20687~~ 0.20688

MWS for EB 8/25/11

4/25

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 2.5 10%

Project Name: Tenesee Valley Authority

Technician's Initials: AB

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/11 1330

Date/Time out: 4/20/11 1330

Test Species: *H. azteca*

Weigh Date: 4/20/11

Test Date: 3/22/11-4/19/11

Dessicator

Date/Time in: 4/20/11 1330

Date/Time out: 4/20/11 1420

Type/Model of Drying Oven: Blue M

Scale: AE 240

QC'd by: MWO

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: CRM 2.5 10% GLEC Number: 8892	1	10	0.81629	0.81343	0.00286	9	0.31778	0.28600
	2	10	0.81341	0.81094	0.00247	8	0.30875	0.24700
	3	10	0.82165	0.81828	0.00337 ⊕	10	0.33700	0.33700
	4	10	0.82968	0.82676	0.00292	10	0.29200	0.29200
	5	10	0.83034	0.82635	0.00399	10	0.39900	0.39900
	6	10	0.80570	0.80306	0.00264	10	0.26400	0.26400
	7	10	0.81582	0.81310	0.00272	10	0.27200	0.27200
	8	10	0.81624	0.81204	0.00420	10	0.42000	0.42000
						AVERAGE:	0.32632	~~0.31462~~ 0.31463

⊕ mult for ERS 8/25/11

(15) 4/25

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 2.5 20%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/11 1330
Date/Time out: 4/20/11 1330

Dessicator
Date/Time in: 4/20/11 1330
Date/Time out: 4/20/11 1440

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: CRM 2.5 20% GLEC Number: 8892	1	10	0.82124	0.81796	0.00328	10	0.32800	0.32800
	2	10	0.83317	0.82994	0.00323	10	0.32300	0.32300
	3	10	0.83358	0.82989	0.00369	10	0.36900	0.36900
	4	10	0.82984	0.82697	0.00287	8	0.35875	0.28700
	5	10	0.81141	0.80865	0.00276	9	0.30667	0.27600
	6	10	0.83791	0.83509	0.00282	10	0.28200	0.28200
	7	10	0.82834	0.82451	0.00383	10	0.38300	0.38300
	8	10	0.83710	0.83257	0.00453	10	0.45300	0.45300
						AVERAGE:	0.35043	~~0.33767~~ 0.33763

4/25

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 2.5 40%

Project Name: Tenesee Valley Authority

Technician's Initials: AS

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/11 1330
Date/Time out: 4/20/11 1330

Test Species: *H. azteca*

Weigh Date: 4/20/11

Test Date: 3/22/11-4/19/11

Dessicator
Date/Time in: 4/20/11 1330
Date/Time out: 4/20/11 1430

Type/Model of Drying Oven: Blue M

Scale: CE 240

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 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: CRM 2.5 40% GLEC Number: 8892	1	10	0.79492	0.79222	0.00270	10	0.27000	0.27000
	2	10	0.82478	0.82283	0.00195	10	0.19500	0.19500
	3	10	0.83280	0.82976	0.00304	9	0.33778	0.30400
	4	10	0.82836	0.82592	0.00244	10	0.24400	0.24400
	5	10	0.81620	0.81392	0.00228	8	~~0.00028~~ 0.28500	0.22800
	6	10	0.82782	0.82496	0.00286	10	0.28600	0.28600
	7	10	0.82075	0.81800	0.00275	10	0.27500	0.27500
	8	10	0.82589	0.82257	0.00332	10	0.33200	0.33200
						AVERAGE:	0.27810	0.26675

⊗ recalc fm ES 8/25/11

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 2.5 60%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/11 1330

Date/Time out: 4/20/11 ~~1330~~ 1330 MWS 8/25/11

Dessicator

Date/Time in: 4/20/11 ~~1330~~ 1330 MWS 8/25/11

Date/Time out: 4/20/11 1450

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: CRM 2.5 60% GLEC Number: 8892	1	10	0.82013	0.81765	0.00248	10	0.24800	0.24800
	2	10	0.82123	0.81868	0.00255	9	0.28333	0.25500
	3	10	0.81762	0.81561	0.00201	10	0.20100	0.20100
	4	10	0.82272	0.82059	0.00213	10	0.21300	0.21300
	5	10	0.82826	0.82531	0.00295	9	0.32778	0.29500
	6	10	0.83039	0.82776	0.00263	9	0.29222	0.26300
	7	10	0.82466	0.82216	0.00250	10	0.25000	0.25000
	8	10	0.81974	0.81723	0.00251	10	0.25100	0.25100
						AVERAGE:	0.25829	0.24700

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 2.5 80%

Project Name: Tenesee Valley Authority

Technician's Initials: AS

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/11 1330
Date/Time out: 4/20/11 1330

Test Species: *H. azteca*

Weigh Date: 4/20/11

Test Date: 3/22/11-4/19/11

Dessicator
Date/Time in: 4/20/11 1330
Date/Time out: 4/20/11 1430

Type/Model of Drying Oven: Blue M
Scale: AE 240

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: CRM 2.5 80% GLEC Number: 8892	1	10	0.82897	0.82625	0.00272	9	0.30222	0.27200
	2	10	0.81984	0.81791	0.00193	10	0.19300	0.19300
	3	10	0.82031	0.81794	0.00237	10	0.23700	0.23700
	4	10	0.82852	0.82639	0.00213	10	0.21300	0.21300
	5	10	0.83012	0.82755	0.00257	10	0.25700	0.25700
	6	10	0.82489	0.82190	0.00299	10	0.29900	0.29900
	7	10	0.81865	0.81614	0.00251	10	0.25100	0.25100
	8	10	0.82755	0.82545	0.00210	10	0.21000	0.21000
						AVERAGE:	0.24528	0.24150

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 2.5 100%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/20/11

Technician's Initials: AB

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/11 1330

Date/Time out: 4/20/11 ~~1330~~ 1330 MWS 8/25/11

Dessicator

Date/Time in: 4/20/11 1330

Date/Time out: 4/20/11 1505

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: CRM 2.5 100% GLEC Number: 8892	1	10	0.83016	0.82706	0.00310	10	0.31000	0.31000
	2	10	0.81655	0.81382	0.00273	10	0.27300	0.27300
	3	10	0.82304	0.82055	0.00249	8	0.31125	0.24900
	4	10	0.81778	0.81549	0.00229	10	0.22900	0.22900
	5	10	0.83063	0.82799	0.00264	10	0.26400	0.26400
	6	10	0.83069	0.82852	0.00217	9	0.24111	0.21700
	7	10	0.82842	0.82579	0.00263	10	0.26300	0.26300
	8	10	0.82481	0.82240	0.00241	9	0.26778	0.24100
						AVERAGE:	0.26989	0.25575

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 3.0 10%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/21/2011

Technician's Initials: NS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~24 hrs
Date/Time in: 4/19/2011 - 1430
Date/Time out: 4/20/2011 - 1430

Dessicator
Date/Time in: 4/20/2011 - 1430
Date/Time out: 4/21/2011 - 1100-1300

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 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: CRM 3.0 10% GLEC Number: 8893 10%	1	10	0.83071	0.82790	0.00281	9	0.31222	0.28100
	2	10	0.83143	0.82889	0.00254	10	0.25400	0.25400
	3	10	0.82224	0.81927	0.00297	10	0.29700	0.29700
	4	10	0.83077	0.82909	0.00168	10	0.16800	0.16800
	5	10	0.82977	0.82651	0.00326	10	0.32600	0.32600
	6	10	0.82142	0.81903	0.00239	10	0.23900	0.23900
	7	10	0.81722	0.81261	0.00461	10	0.46100	0.46100
	8	10	0.81615	0.81268	0.00347	10	0.34700	0.34700
						AVERAGE:	~~0.39553~~ NS 4/25 0.30053	~~0.37162~~ NS 4/25 0.29663

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 3.0

Project Name: Tenesee Valley Authority

Technician's Initials: NS

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/2011 - 1430

Date/Time out: 4/20/2011 - 1430

Test Species: *H. azteca*

Weigh Date: 4/21/2011

Test Date: 3/22/11-4/19/11

Dessicator

Date/Time in: 4/20/2011 - 1430

Date/Time out: 4/21/2011 - 1100-1300

Type/Model of Drying Oven: Blue M

Scale: GE240

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: CRM 3.0 GLEC Number: 8893 20%	1	10	0.83092	0.82883	0.00209	10	0.20900	0.20900
	2	10	0.82259	0.82005	0.00254	10	0.25400	0.25400
	3	10	0.81655	0.81256	0.00399	10	0.39900	0.39900
	4	10	0.82058	0.81849	0.00209	10	0.20900	0.20900
	5	10	0.82113	0.81842	0.00271	8	0.33875	0.27100
	6	10	0.83266	0.83003	0.00263	10	0.26300	0.26300
	7	10	0.83024	0.82690	0.00334	10	0.33400	0.33400
	8	10	0.82319	0.82008	0.00311	10	0.31100	0.31100
						AVERAGE:	0.28972	0.28125

GLEC
Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 3.0 40%

Project Name: Tenesee Valley Authority

Technician's Initials: NS/AB 8/26/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/2011 - 1430
Date/Time out: 4/20/2011 - 1430

Test Species: *H. azteca*

Weigh Date: 4/21/2011

Test Date: 3/22/11-4/19/11

Dessicator
Date/Time in: 4/20/2011 - 1430
Date/Time out: 4/21/2011 - 1100-1300

Type/Model of Drying Oven: Blue M
Scale: AE240

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: CRM 3.0 40% GLEC Number: 8893	1	10	0.83722	0.83297	0.00425	10	0.42500	0.42500
	2	10	0.81334	0.80829	0.00505	10	0.50500	0.50500
	3	10	0.81456	0.81090	0.00366	10	0.36600	0.36600
	4	10	0.81259	0.80883	0.00376	10	0.37600	0.37600
	5	10	0.81724	0.81327	0.00397	10	0.39700	0.39700
	6	10	0.82227	0.81905	0.00322	10	0.32200	0.32200
	7	10 AB 8/26/11	0.81267	0.80920	0.00347	10	0.34700	0.34700
	8	10	0.81192	0.80910	0.00282	10	0.28200	0.28200
						AVERAGE:	0.37750	0.37750

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRm 3.0

Project Name: Tenesee Valley Authority

Technician's Initials: NS

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/2011 - 1430

Date/Time out: 4/20/2011 - 1430

Test Species: *H. azteca*

Weigh Date: 4/21/2011

Test Date: 3/22/11-4/19/11

Dessicator

Date/Time in: 4/20/2011 - 1430

Date/Time out: 4/21/2011 - 1100 - 1300

Type/Model of Drying Oven: Blue M

Scale: AE240

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: CRm 3.0 GLEC Number: 8893 60%	1	10	0.81586	0.81248	0.00338	10	0.33800	0.33800
	2	10	0.81490	0.81243	0.00247	10	0.24700	0.24700
	3	10	0.80926	0.80648	0.00278	10	0.27800	0.27800
	4	10	0.81319	0.81076	0.00243	10	0.24300	0.24300
	5	10	0.81677	0.81379	0.00298	10	0.29800	0.29800
	6	10	0.81636	0.81350	0.00286	9	0.31778	0.28600
	7	10	0.82907	0.82567	0.00340	10	0.34000	0.34000
	8	10	0.82549	0.82337	0.00212	5	0.42400	0.21200
						AVERAGE:	0.31072	0.28025

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 3.0

Project Name: Tenesee Valley Authority

Technician's Initials: NS

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/2011-1430

Date/Time out: 4/20/2011-1430

Test Species: *H. azteca*

Weigh Date: 4/21/2011

Test Date: 3/22/11-4/19/11

Dessicator

Date/Time in: 4/20/2011 - 1430

Date/Time out: 4/21/2011 - 1100-1300

Type/Model of Drying Oven: Blue M

Scale: AE 240

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: CRM 3.0 GLEC Number: 8893 80%	1	10	0.81171	0.80869	0.00302	9	0.33556	0.30200
	2	10	0.81571	0.81305	0.00266	8	0.33250	0.26600
	3	10	0.82263	0.82009	0.00254	10	0.25400	0.25400
	4	10	0.82709	0.82427	0.00282	10	0.28200	0.28200
	5	10	0.82341	0.82047	0.00294	10	0.29400	0.29400
	6	10	0.82316	0.82076	0.00240	10	0.24000	0.24000
	7	10	0.82260	0.81999	0.00261	8	0.32625	0.26100
	8	10	0.83597	0.83366	0.00231	10	0.23100	0.23100
						AVERAGE:	0.28691	0.26625

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 3.0

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/21/11

Technician's Initials: NS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/2011 - 1430

Date/Time out: 4/20/2011 - 1430

Dessicator

Date/Time in: 4/20/2011 - 1430

Date/Time out: 4/21/2011 - 1100 - 1300

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: CRM 3.0 GLEC Number: 8893 100%	1	10	0.82040	0.81822	0.00218	10	0.21800	0.21800
	2	10	0.82013	0.81787	0.00226	10	0.22600	0.22600
	3	10	0.82465	0.82188	0.00277	10	0.27700	0.27700
	4	10	0.81230	0.80935	0.00295	10	0.29500	0.29500
	5	10	0.82065	0.81779	0.00286	9	0.31778	0.28600
	6	10	0.83214	0.82976	0.00238	10	0.23800	0.23800
	7	10	0.81080	0.80809	0.00271	9	0.30111	0.27100
	8	10	0.82231	0.81954	0.00277	10	0.27700	0.27700
						AVERAGE:	0.26874	0.26100

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 4.5 - 10%

Project Name: Tenesee Valley Authority

Technician's Initials: NS

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/2011 - 1500
Date/Time out: 4/20/2011 - 1500

Test Species: *H. azteca*

Weigh Date: 4/21/2011

Test Date: 3/22/11-4/19/11

Dessicator
Date/Time in: ~~4/19/2~~ 4/20/2011 - 1500
Date/Time out: 4/21/2011 - 900 - 1100

Type/Model of Drying Oven: Blue M
Scale: AE 240

QC'd by:

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: CRM 4.5 GLEC Number: 8896 10%	1	10	0.84058	0.83753	0.00305	9	0.33889	0.30500
	2	10	0.81430	0.81220	0.00210	10	0.21000	0.21000
	3	10	0.83193	0.82697	0.00496	10	0.49600	0.49600
	4	10	0.82819	0.82557	0.00262	10	0.26200	0.26200
	5	10	0.83349	0.82923	0.00426	10	0.42600	0.42600
	6	10	0.82716	0.82437	0.00279	10	0.27900	0.27900
	7	10	0.82787	0.82622	0.00165	10	0.16500	0.16500
	8	10	0.83341	0.82889	0.00452	10	0.45200	0.45200
						AVERAGE:	0.32861	~~0.32437~~ 0.32438

4/25

GLEC
Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 4.5 - 20%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/21/2011

Technician's Initials: NS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/2011 - 1500
Date/Time out: 4/20/2011 - 1500

Dessicator
Date/Time in: 4/20/2011 - 1500
Date/Time out: 4/21/2011 - 900-1100

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 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: CRM 4.5 GLEC Number: 8896 20%	1	10	0.83196	0.82848	0.00348	9	0.38667	0.34800
	2	10	0.82519	0.82243	0.00276	10	0.27600	0.27600
	3	10	0.82995	0.82706	0.00289	10	0.28900	0.28900
	4	10	0.83912	0.83589	0.00323	9	0.35889	~~0.35889~~ 4/21 NS 0.32300
	5	10	0.82788	0.82393	0.00395	10	0.39500	0.39500
	6	10	0.82113	0.81734	0.00379	10	0.37900	0.37900
	7	10	0.81011	0.80693	0.00318	10	0.31800	0.31800
	8	10	0.81680	0.81457	0.00223	10	0.22300	0.22300
						AVERAGE:	~~0.32819~~ NS 4/25 0.32820	~~0.31887~~ NS 4/25 0.31888

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 4.5 -40%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE240

Project Name: Tenesee Valley Authority

Weigh Date: 4/21/2011

Technician's Initials: NS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/2011 - 1500

Date/Time out: 4/20/2011 - 1500

20 mw for NS 8/25/11

Dessicator

Date/Time in: 4/20/2011 - 1500

Date/Time out: 4/21/2011 - 900-1100

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: CRM 4.5	1	10	0.80729	0.80418	0.00311	9	0.34556	0.31100
	2	10	0.81818	0.81641	0.00177	8	0.22125	0.17700
GLEC Number:	3	10	0.81180	0.80898	0.00282	10	0.28200	0.28200
8896 40%	4	10	0.81318	0.81137	0.00181	~~10~~ TE 8 * 8/24/11	0.22625	~~0.18100~~ 0.22625 mw 8/25/11
	5	10	0.81166	0.80938	0.00228	10	0.22800	0.22800
	6	10	0.81346	0.81082	0.00264	10	0.26400	0.26400
	7	10	0.82668	0.82425	0.00243	10	0.24300	0.24300
	8	10	0.81516	0.81404	0.00112	4	0.28000 4/21/11 NS	0.11200
						AVERAGE:	0.26126	0.22475

* Tech Error lost two H. azteca during weighing, dropped pan. NS 8/26/11

mw for NS 8/25/11

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 4.5 – 60%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/21/2011

Technician's Initials: NS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/2011 – 1500

Date/Time out: 4/20/2011 - 1500

Dessicator

Date/Time in: 4/20/2011 - 1500

Date/Time out: 4/21/2011 - 900 – 1100

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:	1	10	0.82638	0.82372	0.00266	10	0.26600	0.26600
CRM 4.5	2	10	0.82955	0.82522	0.00433	10	0.43300	0.43300
GLEC Number:	3	10	0.82863	0.82593	0.00270	10	0.27000	0.27000
8896	4	10	0.82596	0.82366	0.00230	10	0.23000	0.23000
60%	5	10	0.82669	0.82419	0.00250	10	0.25000	0.25000
	6	10	0.81427	0.81234	0.00193	9	~~0.19300~~ 0.21445 NS 4/21	~~0.19300~~ 0.19300 NS 4/21
	7	10	0.82476	0.82199	0.00277	10	0.27700	0.27700
	8	10	0.82539	0.82269	0.00270	10	0.27000	0.27000
						AVERAGE:	0.27631	0.27363

Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 4.5 -80%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: QE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/21/2011

Technician's Initials: NS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C

Drying Duration (Hours): ~ 24 hrs

Date/Time in: 4/19/2011 – 1500

Date/Time out: 4/20/2011 – 1500

Dessicator

Date/Time in: 4/20/2011 – 1500

Date/Time out: 4/21/2011 – 900 – 1100

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: CRM 4.5	1	10	0.82342	0.82121	0.00221	10	0.22100	0.22100
	2	10	0.82714	0.82517	0.00197	10	0.19700	0.19700
GLEC Number: 8896 80%	3	10	0.80961	0.80860	0.00101	6	0.16834	0.10100
	4	10	0.81813	0.81637	0.00176	9	0.19556	0.17600
	5	10	0.82393	0.82154	0.00239	10	0.23900	0.23900
	6	10	0.81030	0.80789	0.00241	10	0.24100	0.24100
	7	10	0.82420	0.82214	0.00206	9	0.22889	0.20600
	8	10	0.82130	0.81938	0.00192	9	0.21333	0.19200
						AVERAGE:	~~0.21301~~ 0.21302	0.19663

NS 4/21/11

NS 4/25/11 NW 4/25/11

GLEC
Great Lakes Environmental Center

28-Day *Hyalella azteca* WEIGHT DATA

Sample ID: CRM 4.5 100%

Test Species: *H. azteca*

Type/Model of Drying Oven: Blue M

Scale: AE 240

Project Name: Tenesee Valley Authority

Weigh Date: 4/21/2011

Technician's Initials: AS

Test Date: 3/22/11-4/19/11

Oven Temperature: 60 °C
Drying Duration (Hours): ~ 24 hrs
Date/Time in: 4/19/2011 - 1500
Date/Time out: 4/20/2011 - 1500

Dessicator
Date/Time in: 4/20/2011 - 1500
Date/Time out: 4/21/2011 - 900 - 1100

QC'd by: MWW

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: CRM 4.5	1	10	0.81768	0.81562	0.00206	10	0.20600	0.20600
	2	10	0.82637	0.82306	0.00231	10	0.23100	0.23100
GLEC Number: 8896 100%	3	10	0.82292	0.82079	0.00213	10	0.21300	0.21300
	4	10	0.82125	0.81927	0.00198	10	0.19800	0.19800
	5	10	0.82541	0.82389	0.00152	10	0.15200	0.15200
	6	10	0.82543	0.82360	0.00183	9	0.20333	0.18300
	7	10	0.81336	0.81152	0.00184	9	0.20444	0.18400
	8	10	0.81724	0.81461	0.00263	10	0.26300	0.26300
						AVERAGE:	0.20885	0.20375

MWW 4/21/11 AS 8/25/11

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	3/22/2011	Test ID:	5069-conha	Sample ID:	-LCS
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4	5	6	7	8
GLW	0.8000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LCS + GLW	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LCS + CRW	1.0000	1.0000	0.9000	0.8000	0.9000	0.9000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
GLW	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8		
LCS + GLW	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	8	*	
LCS + CRW	0.9375	0.9375	1.3128	1.1071	1.4120	8.821	8	52.00	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.83792	0.887	-0.8568	1.95459
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.17)	1.44167	2.14479		
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates no significant differences				
Treatments vs LCS + GLW				

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	3/22/2011	Test ID:	5069-conha	Sample ID:	-LCS
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4	5	6	7	8
GLW	0.1537	0.2333	0.2210	0.3270	0.2610	0.2160	0.2380	0.2730
LCS + GLW	0.4160	0.4160	0.4830	0.4710	0.5850	0.4020	0.4130	0.3600
LCS + CRW	0.4470	0.3520	0.4689	0.4125	0.4878	0.4211	0.4530	0.3890

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.2404	0.5423	0.2404	0.1537	0.3270	20.813	8			
LCS + GLW	0.4433	1.0000	0.4433	0.3600	0.5850	15.601	8	*		
LCS + CRW	0.4289	0.9676	0.4289	0.3520	0.4878	10.356	8	0.494	1.761	0.0512

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.93945	0.887	0.85299	1.42771
F-Test indicates equal variances (p = 0.27)	2.42411	8.88539		
The control means are significantly different (p = 9.74E-06)	6.7224	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	0.05118	0.11547	0.00082	0.00338	0.62931	1, 14

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	3/22/2011	Test ID:	5069-conha	Sample ID:	-LCS
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: LCS=Lab Control Sediment; CRW=Clinch River Water; GLW=GLEC Lab Water

Conc-	1	2	3	4	5	6	7	8
GLW	0.1230	0.2100	0.2210	0.3270	0.2610	0.2160	0.2380	0.2730
LCS + GLW	0.4160	0.4160	0.4830	0.4710	0.5850	0.4020	0.4130	0.3600
LCS + CRW	0.4470	0.3520	0.4220	0.3300	0.4390	0.3790	0.4530	0.3890

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.2336	0.5271	0.2336	0.1230	0.3270	25.221	8			
LCS + GLW	0.4433	1.0000	0.4433	0.3600	0.5850	15.601	8	*		
LCS + CRW	0.4014	0.9055	0.4014	0.3300	0.4530	11.446	8	1.427	1.761	0.0517

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.93384	0.887	0.84136	1.15875
F-Test indicates equal variances (p = 0.30)	2.26586	8.88539		
The control means are significantly different (p = 1.34E-05)	6.52605	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	0.0517	0.11664	0.00701	0.00345	0.17561	1, 14

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	3/22/2011	Test ID:	5069-conha	Sample ID:	-LCS
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water, CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
GLW	0.8000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LCS + GLW	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LCS + CRW	1.0000	1.0000	0.9000	0.8000	0.9000	0.9000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
GLW	0.9625	0.9625	1.3535	1.1071	1.4120	8.476	8		
LCS + GLW	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	8	*	
LCS + CRW	0.9375	0.9375	1.3128	1.1071	1.4120	8.821	8	52.00	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.83792	0.887	-0.8568	1.95459
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.17)	1.44167	2.14479		
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates no significant differences				
Treatments vs LCS + GLW				

ToxCalc v5.0.32

Reviewed by: AS

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	3/22/2011	Test ID:	5069-conha	Sample ID:	-LCS
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water, CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
GLW	0.1537	0.2333	0.2210	0.3270	0.2610	0.2160	0.2380	0.2730
LCS + GLW	0.4160	0.4160	0.4830	0.4710	0.5850	0.4020	0.4130	0.3600
LCS + CRW	0.4470	0.3520	0.4689	0.4125	0.4878	0.4211	0.4530	0.3890

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.2404	0.5423	0.2404	0.1537	0.3270	20.813	8			
LCS + GLW	0.4433	1.0000	0.4433	0.3600	0.5850	15.601	8	*		
LCS + CRW	0.4289	0.9676	0.4289	0.3520	0.4878	10.356	8	0.494	1.761	0.0512

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.93945	0.887	0.85299	1.42771
F-Test indicates equal variances (p = 0.27)	2.42411	8.88539		
The control means are significantly different (p = 9.74E-06)	6.7224	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	0.05118	0.11547	0.00082	0.00338	0.62931	1, 14

ToxCalc v5.0.32

Reviewed by: RB

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	3/22/2011	Test ID:	5069-conha	Sample ID:	-LCS
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/9/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water, CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
GLW	0.1230	0.2100	0.2210	0.3270	0.2610	0.2160	0.2380	0.2730
LCS + GLW	0.4160	0.4160	0.4830	0.4710	0.5850	0.4020	0.4130	0.3600
LCS + CRW	0.4470	0.3520	0.4220	0.3300	0.4390	0.3790	0.4530	0.3890

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
GLW	0.2336	0.5271	0.2336	0.1230	0.3270	25.221	8			
LCS + GLW	0.4433	1.0000	0.4433	0.3600	0.5850	15.601	8	*		
LCS + CRW	0.4014	0.9055	0.4014	0.3300	0.4530	11.446	8	1.427	1.761	0.0517

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.93384	0.887	0.84136	1.15875
F-Test indicates equal variances (p = 0.30)	2.26586	8.88539		
The control means are significantly different (p = 1.34E-05)	6.52605	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	0.0517	0.11664	0.00701	0.00345	0.17561	1, 14

ToxCalc v5.0.32

Reviewed by: RB

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	3/22/2011	Test ID:	5069-1.5	Sample ID:	-CRM 1.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water, CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS + CRW	1.0000	1.0000	0.9000	0.8000	0.9000	0.9000	1.0000	1.0000
CRS + CRW	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	0.9000	0.8000
10	1.0000	0.8000	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000
20	1.0000	0.8000	0.8000	0.9000	1.0000	0.7000	0.9000	1.0000
40	1.0000	1.0000	0.8000	1.0000	0.7000	0.8000	1.0000	0.9000
60	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	0.7000	0.7000
80	0.8000	0.8000	0.8000	0.8000	0.9000	0.9000	0.8000	0.8000
100	0.8000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	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 + CRW	0.9375	1.0274	1.3128	1.1071	1.4120	8.821	8				
CRS + CRW	0.9125	1.0000	1.2747	1.1071	1.4120	10.042	8	*		0.9313	1.0000
10	0.9500	1.0411	1.3358	1.1071	1.4120	10.565	8	77.00	46.00	0.9313	1.0000
20	0.8875	0.9726	1.2424	0.9912	1.4120	13.124	8	64.50	46.00	0.8958	0.9620
40	0.9000	0.9863	1.2628	0.9912	1.4120	13.764	8	67.50	46.00	0.8958	0.9620
60	0.9000	0.9863	1.2687	0.9912	1.4120	15.844	8	69.50	46.00	0.8958	0.9620
80	0.8250	0.9041	1.1426	1.1071	1.2490	5.749	8	49.00	46.00	0.8625	0.9262
100	0.9000	0.9863	1.2517	1.1071	1.4120	6.521	8	64.50	46.00	0.8625	0.9262

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.11388	0.895	-0.5478	-0.7677
Bartlett's Test indicates equal variances (p = 0.09)	10.9991	16.8119		
The control means are not significantly different (p = 0.54)	0.62447	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs CRS + CRW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	66.688			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

ToxCalc v5.0.32

Reviewed by: AB

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	3/22/2011	Test ID:	5069-1.5h	Sample ID:	-CRM 1.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4689	0.4125	0.4878	0.4211	0.4530	0.3890
CRS + CRW	0.3522	0.3500	0.3140	0.2430	0.3233	0.3030	0.2567	0.5063
10	0.2340	0.2938	0.2163	0.2500	0.2450	0.2470	0.2930	0.3460
20	0.2870	0.3200	0.3525	0.2856	0.2970	0.3443	0.3367	0.2350
40	0.2590	0.2160	0.2825	0.2210	0.3086	0.2700	0.2150	0.2467
60	0.2850	0.2290	0.2200	0.2530	0.2580	0.3188	0.2543	0.2114
80	0.3100	0.2300	0.2113	0.2488	0.2344	0.2578	0.2150	0.1613
100	0.2262	0.2544	0.2133	0.2411	0.2122	0.2556	0.2356	0.2030

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.4289	1.2956	0.4289	0.3520	0.4878	10.356	8					
CRS + CRW	0.3311	1.0000	0.3311	0.2430	0.5063	24.466	8	*			0.3311	1.0000
*10	0.2656	0.8023	0.2656	0.2163	0.3460	15.880	8	2.876	2.359	0.0537	0.2864	0.8652
20	0.3073	0.9281	0.3073	0.2350	0.3525	12.697	8	1.047	2.359	0.0537	0.2864	0.8652
*40	0.2523	0.7622	0.2523	0.2150	0.3086	13.528	8	3.460	2.359	0.0537	0.2530	0.7643
*60	0.2537	0.7663	0.2537	0.2114	0.3188	13.947	8	3.401	2.359	0.0537	0.2530	0.7643
*80	0.2336	0.7055	0.2336	0.1613	0.3100	18.269	8	4.286	2.359	0.0537	0.2336	0.7055
*100	0.2302	0.6953	0.2302	0.2030	0.2556	8.598	8	4.434	2.359	0.0537	0.2302	0.6953

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.81889	0.895	1.13405	4.11131
Bartlett's Test indicates equal variances (p = 0.02)	14.4513	16.8119		
The control means are significantly different (p = 9.63E-03)	2.99602	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		0.05367	0.1621	0.01145	0.00207	1.9E-04	6, 49
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05*	3.710	7.744	1.664	27.556	2.3566
IC10*	7.419	12.975	3.328	45.175	1.9519
IC15	23.014	18.403	4.993	73.066	1.3636
IC20	32.919				
IC25	64.851				
IC40	>100				
IC50	>100				

* indicates IC estimate less than the lowest concentration

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	3/22/2011	Test ID:	5069-1.5h	Sample ID:	-CRM 1.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4220	0.3300	0.4390	0.3790	0.4530	0.3890
CRS + CRW	0.3170	0.2800	0.3140	0.2430	0.2910	0.3030	0.2310	0.4050
10	0.2340	0.2350	0.1730	0.2500	0.2450	0.2470	0.2930	0.3460
20	0.2870	0.2560	0.2820	0.2570	0.2970	0.2410	0.3030	0.2350
40	0.2590	0.2160	0.2260	0.2210	0.2160	0.2160	0.2150	0.2220
60	0.2850	0.2290	0.2200	0.2530	0.2580	0.2550	0.1780	0.1480
80	0.2480	0.1840	0.1690	0.1990	0.2110	0.2320	0.1720	0.1290
100	0.1810	0.2290	0.1920	0.2170	0.1910	0.2300	0.2120	0.2030

			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + CRW	0.4014	1.3469	0.4014	0.3300	0.4530	11.446	8				
CRS + CRW	0.2980	1.0000	0.2980	0.2310	0.4050	17.927	8	*		0.2980	1.0000
10	0.2529	0.8486	0.2529	0.1730	0.3460	19.740	8	55.00	46.00	0.2613	0.8769
20	0.2698	0.9052	0.2698	0.2350	0.3030	9.587	8	56.50	46.00	0.2613	0.8769
*40	0.2239	0.7513	0.2239	0.2150	0.2590	6.571	8	38.00	46.00	0.2261	0.7586
*60	0.2283	0.7659	0.2283	0.1480	0.2850	19.918	8	45.00	46.00	0.2261	0.7586
*80	0.1930	0.6477	0.1930	0.1290	0.2480	19.681	8	39.00	46.00	0.1999	0.6709
*100	0.2069	0.6942	0.2069	0.1810	0.2300	8.783	8	36.00	46.00	0.1999	0.6709

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.77837	0.895	0.28418	1.457
Bartlett's Test indicates unequal variances (p = 9.99E-03)	16.8152	16.8119		
The control means are significantly different (p = 9.82E-04)	4.14974	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	20	40	28.2843	
Treatments vs CRS + CRW				

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05*	4.061	6.706	2.093	26.312	2.2104
IC10*	8.123	10.105	4.187	35.253	1.1032
IC15	24.546	13.555	6.280	64.624	0.9192
IC20	33.000				
IC25	61.962				
IC40	>100				
IC50	>100				

* indicates IC estimate less than the lowest concentration

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	3/22/2011	Test ID:	5069-2.5h	Sample ID:	-CRM 2.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water, CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS + CRW	1.0000	1.0000	0.9000	0.8000	0.9000	0.9000	1.0000	1.0000
CRS + CRW	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	0.9000	0.8000
10	0.9000	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	0.8000	0.9000	1.0000	1.0000	1.0000
40	1.0000	1.0000	0.9000	1.0000	0.8000	1.0000	1.0000	1.0000
60	1.0000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000
80	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	0.8000	1.0000	1.0000	0.9000	1.0000	0.9000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + CRW	0.9375	1.0274	1.3128	1.1071	1.4120	8.821	8				
CRS + CRW	0.9125	1.0000	1.2747	1.1071	1.4120	10.042	8	*		0.9583	1.0000
10	0.9625	1.0548	1.3535	1.1071	1.4120	8.476	8	79.50	46.00	0.9583	1.0000
20	0.9625	1.0548	1.3535	1.1071	1.4120	8.476	8	79.50	46.00	0.9583	1.0000
40	0.9625	1.0548	1.3535	1.1071	1.4120	8.476	8	79.50	46.00	0.9583	1.0000
60	0.9625	1.0548	1.3509	1.2490	1.4120	6.244	8	79.00	46.00	0.9583	1.0000
80	0.9875	1.0822	1.3916	1.2490	1.4120	4.140	8	85.00	46.00	0.9583	1.0000
100	0.9500	1.0411	1.3332	1.1071	1.4120	8.799	8	76.50	46.00	0.9500	0.9913

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	2.06651	0.895	-1.1279	0.33976
Bartlett's Test indicates equal variances (p = 0.55)	4.95501	16.8119		
The control means are not significantly different (p = 0.54)	0.62447	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs CRS + CRW				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	3/22/2011	Test ID:	5069-2.5h	Sample ID:	-CRM 2.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4689	0.4125	0.4878	0.4211	0.4530	0.3890
CRS + CRW	0.3522	0.3500	0.3140	0.2430	0.3233	0.3030	0.2567	0.5063
10	0.3178	0.3087	0.3370	0.2920	0.3990	0.2640	0.2720	0.4200
20	0.3280	0.3230	0.3690	0.3588	0.3067	0.2820	0.3830	0.4530
40	0.2700	0.1950	0.3378	0.2440	0.2850	0.2860	0.2750	0.3320
60	0.2480	0.2833	0.2010	0.2130	0.3278	0.2922	0.2500	0.2510
80	0.3022	0.1930	0.2370	0.2130	0.2570	0.2990	0.2510	0.2100
100	0.3100	0.2730	0.3112	0.2290	0.2640	0.2411	0.2630	0.2678

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.4289	1.2956	0.4289	0.3520	0.4878	10.356	8					
CRS + CRW	0.3311	1.0000	0.3311	0.2430	0.5063	24.466	8	*			0.3359	1.0000
10	0.3263	0.9857	0.3263	0.2640	0.4200	17.400	8	0.182	2.359	0.0613	0.3359	1.0000
20	0.3504	1.0585	0.3504	0.2820	0.4530	15.196	8	-0.745	2.359	0.0613	0.3359	1.0000
40	0.2781	0.8400	0.2781	0.1950	0.3378	16.490	8	2.037	2.359	0.0613	0.2781	0.8278
*60	0.2583	0.7802	0.2583	0.2010	0.3278	16.142	8	2.798	2.359	0.0613	0.2583	0.7689
*80	0.2453	0.7409	0.2453	0.1930	0.3022	16.443	8	3.299	2.359	0.0613	0.2576	0.7668
100	0.2699	0.8152	0.2699	0.2290	0.3112	10.771	8	2.352	2.359	0.0613	0.2576	0.7668

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.77432	0.895	0.91511	1.89493
Bartlett's Test indicates equal variances (p = 0.21)	8.34217	16.8119		
The control means are significantly different (p = 9.63E-03)	2.99602	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.06134	0.18529	0.01345	0.0027	4.8E-04	6, 49
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	25.808	9.218	3.411	36.976	-0.6848
IC10	31.617	8.906	6.822	46.172	-0.8190
IC15	37.425				
IC20	49.442				
IC25	>100				
IC40	>100				
IC50	>100				

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	3/22/2011	Test ID:	5069-2.5h	Sample ID:	-CRM 2.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/7/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-%	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4220	0.3300	0.4390	0.3790	0.4530	0.3890
CRS + CRW	0.3170	0.2800	0.3140	0.2430	0.2910	0.3030	0.2310	0.4050
10	0.2860	0.2470	0.3370	0.2920	0.3990	0.2640	0.2720	0.4200
20	0.3280	0.3230	0.3690	0.2870	0.2760	0.2820	0.3830	0.4530
40	0.2700	0.1950	0.3040	0.2440	0.2280	0.2860	0.2750	0.3320
60	0.2480	0.2550	0.2010	0.2130	0.2950	0.2630	0.2500	0.2510
80	0.2720	0.1930	0.2370	0.2130	0.2570	0.2990	0.2510	0.2100
100	0.3100	0.2730	0.2490	0.2290	0.2640	0.2170	0.2630	0.2410

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.4014	1.3469	0.4014	0.3300	0.4530	11.446	8					
CRS + CRW	0.2980	1.0000	0.2980	0.2310	0.4050	17.927	8	*			0.3167	1.0000
10	0.3146	1.0558	0.3146	0.2470	0.4200	20.460	8	-0.705	2.359	0.0556	0.3167	1.0000
20	0.3376	1.1330	0.3376	0.2760	0.4530	18.091	8	-1.681	2.359	0.0556	0.3167	1.0000
40	0.2667	0.8951	0.2667	0.1950	0.3320	16.317	8	1.326	2.359	0.0556	0.2667	0.8421
60	0.2470	0.8289	0.2470	0.2010	0.2950	11.776	8	2.164	2.359	0.0556	0.2481	0.7832
*80	0.2415	0.8104	0.2415	0.1930	0.2990	14.635	8	2.397	2.359	0.0556	0.2481	0.7832
100	0.2557	0.8582	0.2557	0.2170	0.3100	11.295	8	1.793	2.359	0.0556	0.2481	0.7832

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.76237	0.895	0.66999	0.30007
Bartlett's Test indicates equal variances (p = 0.20)	8.55147	16.8119		
The control means are significantly different (p = 9.82E-04)	4.14974	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.0556	0.18657	0.0109	0.00222	5.3E-04	6, 49
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	26.335	4.084	20.477	37.590	1.0984
IC10	32.670	5.585	27.257	47.625	1.1449
IC15	39.005				
IC20	54.304				
IC25	>100				
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AB

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	3/22/2011	Test ID:	5069-3.0h	Sample ID:	-CRM 3.0
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	1.0000	1.0000	0.9000	0.8000	0.9000	0.9000	1.0000	1.0000
CRS + CRW	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	0.9000	0.8000
10	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000
40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
60	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	0.5000
80	0.9000	0.8000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000
100	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	0.9000	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 + CRW	0.9375	1.0274	1.3128	1.1071	1.4120	8.821	8				
CRS + CRW	0.9125	1.0000	1.2747	1.1071	1.4120	10.042	8	*		0.9688	1.0000
10	0.9875	1.0822	1.3916	1.2490	1.4120	4.140	8	85.00	46.00	0.9688	1.0000
20	0.9750	1.0685	1.3739	1.1071	1.4120	7.845	8	82.50	46.00	0.9688	1.0000
40	1.0000	1.0959	1.4120	1.4120	1.4120	0.000	8	88.00	46.00	0.9688	1.0000
60	0.9250	1.0137	1.3133	0.7854	1.4120	16.813	8	78.50	46.00	0.9458	0.9763
80	0.9375	1.0274	1.3154	1.1071	1.4120	10.667	8	74.00	46.00	0.9458	0.9763
100	0.9750	1.0685	1.3713	1.2490	1.4120	5.501	8	82.00	46.00	0.9458	0.9763

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.89673	0.895	-2.2052	7.08187
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 0.54)	0.62447	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		
Treatments vs CRS + CRW				

Linear Interpolation (200 Resamples)

Point		SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	3/22/2011	Test ID:	5069-3.0h	Sample ID:	-CRM 3.0
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4689	0.4125	0.4878	0.4211	0.4530	0.3890
CRS + CRW	0.3522	0.3500	0.3140	0.2430	0.3233	0.3030	0.2567	0.5063
10	0.3122	0.2540	0.2970	0.1680	0.3260	0.2390	0.4610	0.3470
20	0.2090	0.2540	0.3990	0.2090	0.3387	0.2630	0.3340	0.3110
40	0.4250	0.5050	0.3660	0.3760	0.3970	0.3220	0.3470	0.2820
60	0.3380	0.2470	0.2780	0.2430	0.2980	0.3178	0.3400	0.4240
80	0.3356	0.3325	0.2540	0.2820	0.2940	0.2400	0.3263	0.2310
100	0.2180	0.2260	0.2770	0.2950	0.3178	0.2380	0.3011	0.2770

			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + CRW	0.4289	1.2956	0.4289	0.3520	0.4878	10.356	8				
CRS + CRW	0.3311	1.0000	0.3311	0.2430	0.5063	24.466	8	*		0.3311	1.0000
10	0.3005	0.9078	0.3005	0.1680	0.4610	28.741	8	59.00	46.00	0.3226	0.9744
20	0.2897	0.8751	0.2897	0.2090	0.3990	23.257	8	59.00	46.00	0.3226	0.9744
40	0.3775	1.1403	0.3775	0.2820	0.5050	17.955	8	82.00	46.00	0.3226	0.9744
60	0.3107	0.9386	0.3107	0.2430	0.4240	18.986	8	62.50	46.00	0.3107	0.9386
80	0.2869	0.8667	0.2869	0.2310	0.3356	14.714	8	56.00	46.00	0.2869	0.8667
100	0.2687	0.8117	0.2687	0.2180	0.3178	13.798	8	48.00	46.00	0.2687	0.8117

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	0.93781	0.895	0.65915	0.89528
Bartlett's Test indicates equal variances (p = 0.31)	7.08096	16.8119		
The control means are significantly different (p = 9.63E-03)	2.99602	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		
Treatments vs CRS + CRW				

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	53.619	26.789	3.214	81.075	-0.3923
IC10	70.726				
IC15	86.066				
IC20	>100				
IC25	>100				
IC40	>100				
IC50	>100				

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	3/22/2011	Test ID:	5069-3.0h	Sample ID:	-CRM 3.0
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4220	0.3300	0.4390	0.3790	0.4530	0.3890
CRS + CRW	0.3170	0.2800	0.3140	0.2430	0.2910	0.3030	0.2310	0.4050
10	0.2810	0.2540	0.2970	0.1680	0.3260	0.2390	0.4610	0.3470
20	0.2090	0.2540	0.3990	0.2090	0.2710	0.2630	0.3340	0.3110
40	0.4250	0.5050	0.3660	0.3760	0.3970	0.3220	0.3470	0.2820
60	0.3380	0.2470	0.2780	0.2430	0.2980	0.2860	0.3400	0.2120
80	0.3020	0.2660	0.2540	0.2820	0.2940	0.2400	0.2610	0.2310
100	0.2180	0.2260	0.2770	0.2950	0.2860	0.2380	0.2710	0.2770

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.4014	1.3469	0.4014	0.3300	0.4530	11.446	8					
CRS + CRW	0.2980	1.0000	0.2980	0.2310	0.4050	17.927	8	*			0.3133	1.0000
10	0.2966	0.9954	0.2966	0.1680	0.4610	29.153	8	0.048	2.359	0.0671	0.3133	1.0000
20	0.2813	0.9438	0.2813	0.2090	0.3990	22.946	8	0.589	2.359	0.0671	0.3133	1.0000
40	0.3775	1.2668	0.3775	0.2820	0.5050	17.955	8	-2.796	2.359	0.0671	0.3133	1.0000
60	0.2802	0.9404	0.2802	0.2120	0.3400	16.189	8	0.624	2.359	0.0671	0.2802	0.8944
80	0.2663	0.8935	0.2663	0.2310	0.3020	9.422	8	1.117	2.359	0.0671	0.2663	0.8497
100	0.2610	0.8758	0.2610	0.2180	0.2950	11.214	8	1.301	2.359	0.0671	0.2610	0.8330

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.7076	0.895	0.61435	1.38655
Bartlett's Test indicates equal variances (p = 0.03)	13.9344	16.8119		
The control means are significantly different (p = 9.82E-04)	4.14974	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100			0.06707	0.22507	0.01227	0.00323	0.00349	6, 49
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	49.468	12.388	7.616	68.235	-1.6509
IC10	58.937				
IC15	79.868				
IC20	>100				
IC25	>100				
IC40	>100				
IC50	>100				

ToxCalc v5.0.32

Reviewed by: AB

Hyalella azteca 28d Survival and Growth Test-28-Day Survival

Start Date:	3/22/2011	Test ID:	5069-4.5h	Sample ID:	-CRM 4.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	1.0000	1.0000	0.9000	0.8000	0.9000	0.9000	1.0000	1.0000
CRS + CRW	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	0.9000	0.8000
10	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000
40	0.9000	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000	0.4000
60	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000	1.0000
80	1.0000	1.0000	0.6000	0.9000	1.0000	1.0000	0.9000	0.9000
100	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	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 + CRW	0.9375	1.0274	1.3128	1.1071	1.4120	8.821	8				
CRS + CRW	0.9125	1.0000	1.2747	1.1071	1.4120	10.042	8	*		0.9583	1.0000
10	0.9875	1.0822	1.3916	1.2490	1.4120	4.140	8	85.00	46.00	0.9583	1.0000
20	0.9750	1.0685	1.3713	1.2490	1.4120	5.501	8	82.00	46.00	0.9583	1.0000
40	0.8875	0.9726	1.2626	0.6847	1.4120	20.521	8	73.00	46.00	0.9406	0.9815
60	0.9875	1.0822	1.3916	1.2490	1.4120	4.140	8	85.00	46.00	0.9406	0.9815
80	0.9125	1.0000	1.2852	0.8861	1.4120	14.029	8	72.50	46.00	0.9406	0.9815
100	0.9750	1.0685	1.3713	1.2490	1.4120	5.501	8	82.00	46.00	0.9406	0.9815

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.82496	0.895	-2.1111	6.96082
Bartlett's Test indicates unequal variances (p = 7.33E-05)	28.571	16.8119		
The control means are not significantly different (p = 0.54)	0.62447	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		
Treatments vs CRS + CRW				

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: AB

Hyalella azteca 28d Survival and Growth Test-28-day Average Growth

Start Date:	3/22/2011	Test ID:	5069-4.5h	Sample ID:	-CRM 4.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4689	0.4125	0.4878	0.4211	0.4530	0.3890
CRS + CRW	0.3522	0.3500	0.3140	0.2430	0.3233	0.3030	0.2567	0.5063
10	0.3389	0.2100	0.4960	0.2620	0.4260	0.2790	0.1650	0.4520
20	0.3867	0.2760	0.2890	0.3589	0.3950	0.3790	0.3180	0.2230
40	0.3456	0.2213	0.2820	0.2262	0.2280	0.2640	0.2430	0.2800
60	0.2660	0.4330	0.2700	0.2300	0.2500	0.2144	0.2770	0.2700
80	0.2210	0.1970	0.1683	0.1956	0.2390	0.2410	0.2289	0.2133
100	0.2060	0.2310	0.2130	0.1980	0.1520	0.2033	0.2044	0.2630

			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
LCS + CRW	0.4289	1.2956	0.4289	0.3520	0.4878	10.356	8				
CRS + CRW	0.3311	1.0000	0.3311	0.2430	0.5063	24.466	8	*		0.3311	1.0000
10	0.3286	0.9926	0.3286	0.1650	0.4960	36.476	8	66.00	46.00	0.3286	0.9926
20	0.3282	0.9913	0.3282	0.2230	0.3950	18.866	8	72.00	46.00	0.3282	0.9913
40	0.2613	0.7892	0.2613	0.2213	0.3456	15.954	8	47.50	46.00	0.2688	0.8119
60	0.2763	0.8346	0.2763	0.2144	0.4330	24.241	8	52.00	46.00	0.2688	0.8119
*80	0.2130	0.6434	0.2130	0.1683	0.2410	11.678	8	36.00	46.00	0.2130	0.6434
*100	0.2088	0.6308	0.2088	0.1520	0.2630	14.976	8	38.00	46.00	0.2088	0.6308

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.04876	0.895	0.59844	1.49384
Bartlett's Test indicates unequal variances (p = 1.18E-03)	22.0649	16.8119		
The control means are significantly different (p = 9.63E-03)	2.99602	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	60	80	69.282	
Treatments vs CRS + CRW				

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	24.608	10.103	2.820	30.140	0.8294
IC10	30.180	10.716	5.640	60.040	0.6906
IC15	35.752	14.950	8.459	65.322	0.5726
IC20	61.411	15.949	24.871	70.581	-0.0335
IC25	67.347				
IC40	>100				
IC50	>100				

Hyalella azteca 28d Survival and Growth Test-28-Day Biomass

Start Date:	3/22/2011	Test ID:	5069-4.5h	Sample ID:	-CRM 4.5
End Date:	4/19/2011	Lab ID:	-GREAT LAKES ENVIRONM	Sample Type:	-WHOLE SEDIMENT
Sample Date:	2/8/2011	Protocol:	EPA 600/R-99/064	Test Species:	HA-Hyalella azteca

Comments: CRM=Clinch River Mile; LCS=Lab Control Sediment; CRW=Clinch River Water CRS=Clinch Ref. Sediment

Conc-	1	2	3	4	5	6	7	8
LCS + CRW	0.4470	0.3520	0.4220	0.3300	0.4390	0.3790	0.4530	0.3890
CRS + CRW	0.3170	0.2800	0.3140	0.2430	0.2910	0.3030	0.2310	0.4050
10	0.3050	0.2100	0.4960	0.2620	0.4260	0.2790	0.1650	0.4520
20	0.3480	0.2760	0.2890	0.3230	0.3950	0.3790	0.3180	0.2230
40	0.3110	0.1770	0.2820	0.2262	0.2280	0.2640	0.2430	0.1120
60	0.2660	0.4330	0.2700	0.2300	0.2500	0.1930	0.2770	0.2700
80	0.2210	0.1970	0.1010	0.1760	0.2390	0.2410	0.2060	0.1920
100	0.2060	0.2310	0.2130	0.1980	0.1520	0.1830	0.1840	0.2630

			Transform: Untransformed						1-Tailed		Isotonic	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
LCS + CRW	0.4014	1.3469	0.4014	0.3300	0.4530	11.446	8					
CRS + CRW	0.2980	1.0000	0.2980	0.2310	0.4050	17.927	8	*			0.3137	1.0000
10	0.3244	1.0885	0.3244	0.1650	0.4960	37.009	8	-0.775	2.359	0.0802	0.3137	1.0000
20	0.3189	1.0701	0.3189	0.2230	0.3950	17.660	8	-0.614	2.359	0.0802	0.3137	1.0000
40	0.2304	0.7732	0.2304	0.1120	0.3110	27.124	8	1.987	2.359	0.0802	0.2520	0.8032
60	0.2736	0.9182	0.2736	0.1930	0.4330	25.641	8	0.717	2.359	0.0802	0.2520	0.8032
*80	0.1966	0.6598	0.1966	0.1010	0.2410	22.775	8	2.980	2.359	0.0802	0.2002	0.6380
*100	0.2037	0.6837	0.2037	0.1520	0.2630	16.462	8	2.771	2.359	0.0802	0.2002	0.6380

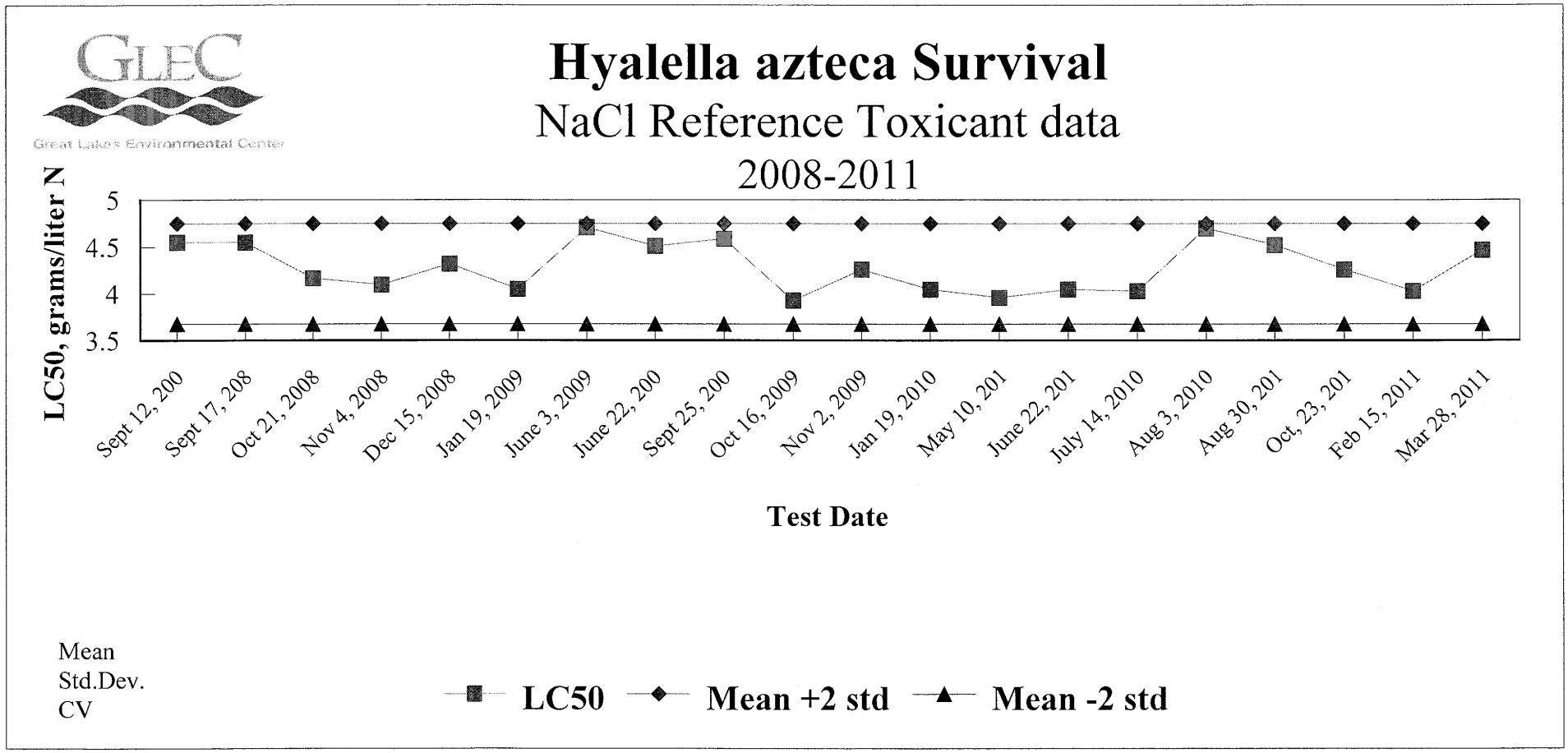
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.77897	0.895	0.31621	0.92126
Bartlett's Test indicates equal variances (p = 0.03)	13.8342	16.8119		
The control means are significantly different (p = 9.82E-04)	4.14974	2.14479		

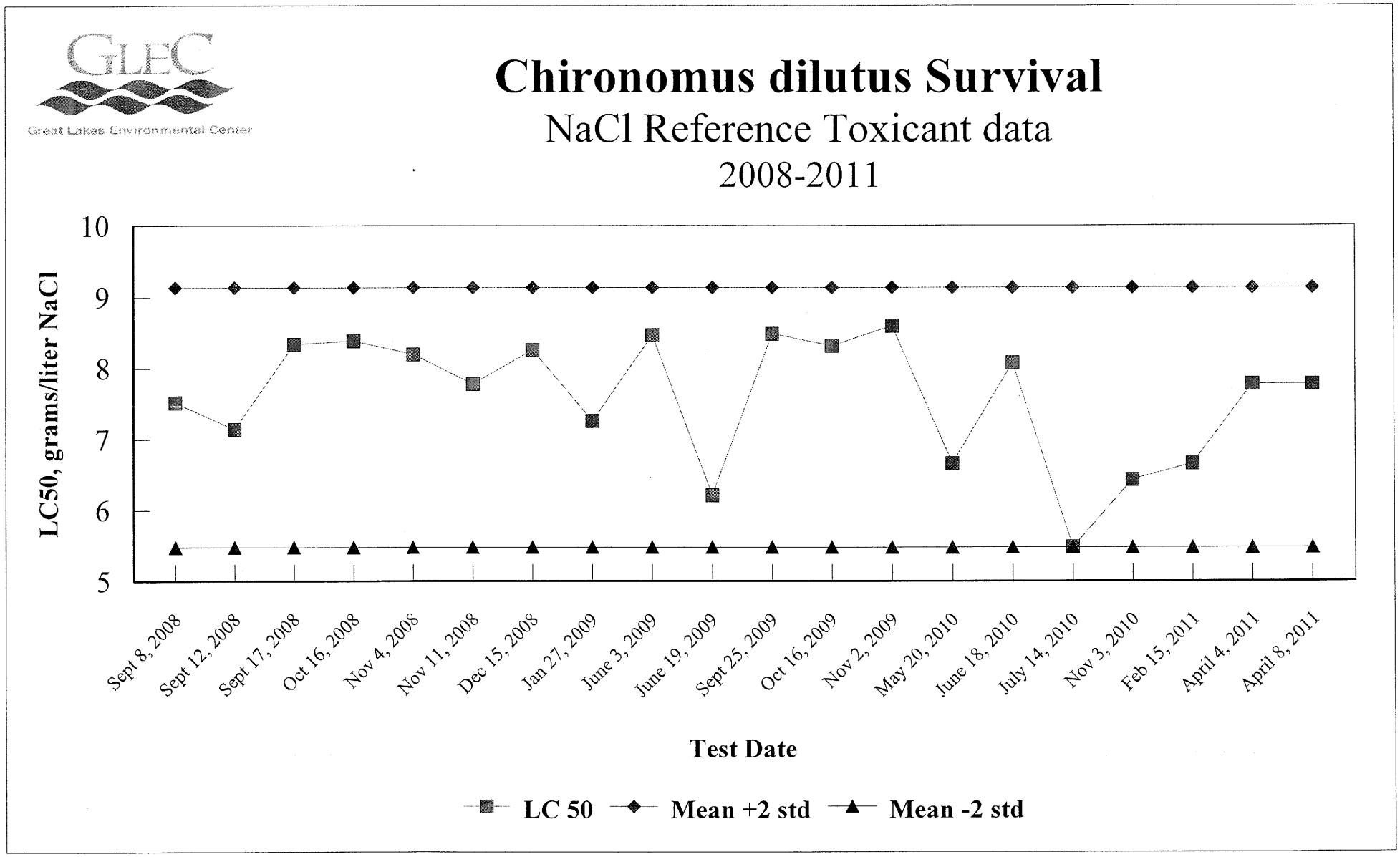
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	60	80	69.282		0.08024	0.26926	0.02294	0.00463	4.9E-04	6, 49
Treatments vs CRS + CRW										

Linear Interpolation (200 Resamples)

Point		SD	95% CL		Skew
IC05	25.082	8.091	4.645	32.422	1.0446
IC10	30.165	9.877	9.290	61.180	1.4763
IC15	35.247	14.437	17.958	65.310	0.9083
IC20	60.392	15.948	25.988	70.767	0.2122
IC25	66.446	14.980	33.210	77.041	-0.7496
IC40	>100				
IC50	>100				

Appendix G
Reference Toxicant Data


GLEC
Great Lakes Environmental Center
Hyalella azteca Survival
NaCl Reference Toxicant data
2008-2011
LC50, grams/liter N
5
4.5
4
3.5
Sept 12, 200
Sept 17, 208
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
Test Date
Mean
Std.Dev.
CV
LC50
Mean +2 std
Mean -2 std


GLEC
Great Lakes Environmental Center
Chironomus dilutus Survival
NaCl Reference Toxicant data
2008-2011
LC50, grams/liter NaCl
10
9
8
7
6
5
Sept 8, 2008
Sept 12, 2008
Sept 17, 2008
Oct 16, 2008
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
Test Date
LC 50
Mean +2 std
Mean -2 std