EVALUATION OF SEDIMENTS FROM

THE ASHLAND HARBOR LAKEFRONT SITE

FOR TOXICTY TO

HYALELLA AZTECA, PIMEPHALES PROMELAS,

CHIRONOMUS DILUTUS, AND *LUMBRICULUS VARIEGATUS*

EXPOSED IN A VARIETY OF BIOASSAYS

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FINAL REPORT

To

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INTRODUCTION

The University of Wisconsin-Superior's Lake Superior Research Institute (LSRI) contracted with URS to evaluate sediments from the Ashland Lakefront site for toxicity toward several species of benthic invertebrates and one species of fish. Sediment samples were collected from a total of six reference stations and eight Site stations. The contaminated sediment from one of the sites was diluted with dilution sediment to obtain a concentration gradient. The following tests were conducted: a 28-day exposure of *Hyalella azteca*, a 21-day exposure of *Hyalella azteca* to reference sediment only, a 28-day exposure of *Hyalella azteca* to new reference sediment and previous non-reference sediment, a ten-day exposure of *Hyalella azteca* to a sediment dilution series under laboratory and ultraviolet light conditions with some treatments containing detritus, one seven-day solid phase fathead minnow exposure, one seven-day solid phase fathead minnow exposure under ultraviolet light, an early life stage *Chironomus dilutus* exposure, a *Lumbriculus variegatus* bioaccumulation study, and finally a sediment polycyclic aromatic hydrocarbon (PAH) equilibrium partitioning study. The endpoints of survival and growth were determined for most studies except for the bioaccumulation study and PAH equilibrium study. Only survival was used as an endpoint for the 21-day exposure of *Hyalella azteca* to the newly collected reference sediment.

METHODS

Sediment Collection, Preparation and Chemical Analysis

Sediment was collected by staff from URS between the dates of 18 June 2005 and 24 June 2005 and placed in plastic two-gallon pails with minimal head space. Two new reference (SQT13 and SQT14) sediment samples were collected on September 27, 2006. The sediment was picked up from the Ashland Harbor site by LSRI staff and transported back to the lab on ice, or in the case of the September samples, dropped off by URS at the LSRI laboratory. The samples were stored at 4.0 °C until they were homogenized. The samples were designated as having been collected from a reference station, a Site station and the general substrate type noted. Table 1 describes the treatments and includes performance controls.

Table 1. Sediment Identification, Designation, and Substrate Type.

Treatment Identification	Designation	Substrate Type
Silica Sand	Performance control	Sand
West Bearskin	Performance control	Sand
Formulated Sediment	Performance control	Sand
SQT9	Reference	Wood
SQT10	Reference	Sand
SQT11	Reference	Wood
SQT12	Reference	Sand
SQT13	Reference	Sand
SQT14	Reference	Sand
SQT1	Non-reference	Sand
SQT2	Non-reference	Wood
SQT3	Non-reference	Sand
SQT4	Non-reference	Wood
SQT5	Non-reference	Wood
SQT6	Non-reference	Sand
SQT7	Non-reference	Sand

SQT8	Non-reference	Wood

Prior to testing, the sediment was homogenized for 15 minutes using a commercial drill equipped with a stainless steel mortar paddle. At 5-minute intervals, the sediment was briefly stirred manually to ensure further homogeneity. After homogenization, all sediment was immediately placed into the test beakers. Between homogenization of sediments, all equipment was cleaned with a lab soap solution, lab water, 10% nitric acid, deionized water, acetone, and deionized water. Samples were collected from each sediment for the following determinations: PAHs, TAL metals, TOC, total sulfide, total cyanide, and grain size (sieve only). The samples were sent to Pace Analytical, Green Bay, WI for analysis and results transmitted to URS.

Solid Phase Sediment Toxicity Tests

Solid phase sediment toxicity tests were performed with the following four freshwater species: the crustacean *Hyalella azteca*, the insect *Chironomus dilutus,* the oligochaete *Lumbriculus variegatus*, and the fish *Pimephales promelas* (fathead minnow). The objectives of each of the tests were slightly different and will be discussed below. In general, the objective was to determine whether the contaminants in the sediment were harmful to the test organisms.

The LSRI test protocols: "Conducting a 28-d Sediment Toxicity Test with *Hyalella azteca"* (SOP AT/34); "Conducting a 28-d Bioaccumulation Sediment Toxicity Test with the Oligochaete, *Lumbriculus variegatus*" (SOP AT/19); and "Conducting a 7-d Sediment Renewal Toxicity Test with *Pimephales promelas*" (SOP AT/33) are based upon EPA-developed methods (U.S. EPA, 2000). Conducting an Early Life Stage Sediment Renewal Toxicity Test with *Chironomus dilutus* is also based upon the EPA-developed method (U.S. EPA, 2000). Briefly, the tests were initiated with juvenile life-stages in the cases of *H. azteca* (7-8 days old), *C. dilutus* (less than 4.0 hours old), *P. promelas* (7 days old), and adult *L.variegatus* organisms. The tests were performed at water temperatures of 23.0 ±2.0 °C, and the overlying water was regularly exchanged within the aquaria containing the screened beakers approximately two times daily at a rate of 32.0 ± 2.0 mL/min for approximately 1.0 hour. A 16L:8D photoperiod was maintained.

Test	Method	Conditions	Fed	Age of Organism at test initiation	Endpoint
28-d H. azteca	USEPA 2000, LSRI SOP AT/34	Sediment from 8 site stations and 4 reference stations	1.0 mL daily of a yeast, Cerophyll®, and trout chow mixture containing 1800 mg/L total suspended solids.	7-8 d	Mortality, weight
21-d H. azteca	USEPA 2000, LSRI SOP AT/34	Sediment from 1 site station and 2 reference stations	1.0 mL daily of a yeast, Cerophyll®, and trout chow mixture containing 1800 mg/L total suspended solids.	7-8 d	Mortality
28-d H. azteca	USEPA 2000, LSRI SOP AT/34	Sediment from 8 site stations and 2 “old” and 2 “new” reference stations	1.0 mL daily of a yeast, Cerophyll®, and trout chow mixture containing 1800 mg/L total suspended solids.	7-8 d	Mortality, weight
10-d H. azteca	USEPA 2000, LSRI SOP AT/34	Sediment from 4 site stations, a dilution series (SQT1), and 2 reference stations	1.0 mL daily of a yeast, Cerophyll®, and trout chow mixture containing 1800 mg/L total suspended solids.	7-8 d	Mortality, weight
10-d H. azteca	USEPA 2000, LSRI SOP AT/34	Sediment from 4 site stations, a dilution series (SQT1), and 2 reference stations. Exposed to UV light	1.0 mL daily of a yeast, Cerophyll®, and trout chow mixture containing 1800 mg/L total suspended solids.	7-8 d	Mortality, weight
7-d P. promelas	USEPA 2000, LSRI SOP AT/33	Sediment from 8 site stations and 4 reference stations	0.15 g (1000-1500 nauplii) of newly hatched (less than 24-h old) brine shrimp nauplii (2x daily)	7 d	Mortality, weight
7-d P. promelas	USEPA 2000, LSRI SOP AT/33	Sediment from 8 site stations and 4 reference stations. Exposed to UV light	0.15 g (1000-1500 nauplii) of newly hatched (less than 24-h old) brine shrimp nauplii (2x daily)	7 d	Mortality, weight
10-d C. dilutus	USEPA 2000	Sediment from 8 site stations and 4 reference stations	1.0 mL daily of a 4.0 g/L Tetrafin® suspension	< 4.0 hr	Mortality, weight
28-d L. variegates	USEPA 2000, LSRI SOP AT/19	Sediment from 6 site stations and 4 reference stations	No feeding	Adult	Bioaccumulation

Approximately 100 mL of homogenized sediment was placed into each 300-mL beaker containing two screened holes about two-thirds of the distance up the beaker walls to allow for water exchange between the beaker and the aquarium in which it was placed. Each aquarium contained eight replicate beakers for each species and sediment type tested. A set of eight replicate beakers was placed into a glass aquarium, which received the renewal water. The aquaria were then placed within the larger water baths set to maintain the desired test temperature (23.0 °C). Sediment was added one day prior to the addition of the test animals to allow the sediment to settle and overlying water to clear. Observations of the bioassay beakers showed that particulates remained suspended for at least several days in tests with sandy and woody sediments (Appendix 22, Photos). Ten organisms were added to each replicate for all species except for the *C. dilutus* which had twelve organisms added. The replicate beakers were fed equal volumes of food. *H. azteca* received 1.0 mL daily of a yeast, Cerophyll®, and trout chow mixture containing 1800 mg/L total suspended solids. *C. dilutus* was fed 1.0 mL daily of a 4.0 g/L Tetrafin® suspension. Fathead minnows were fed twice daily, six hours apart, 0.15 g (1000-1500 nauplii) of newly hatched (less than 24-h old) brine shrimp nauplii. The *L. variegatus* test organisms were not fed during the test. At the end of the appropriate exposure period, sediment from each beaker was sieved through a 425μm mesh sieve, rinsed into a clear Pyrex® pan, placed over a light table, and the surviving organisms retrieved. The *H. azteca* and *P. promelas* organisms were placed into dried, pre-weighed aluminum pans and dried at approximately 60°C for 24 hours to obtain dry weight measurements. Ash-free dry weights were also determined on the *C. dilutus* by placing the previously ashed and weighed pans containing the animals in a muffle furnace at 550 °C for approximately 2.0 hours. The *L. variegatus* were placed in clean lab water and allowed to depurate overnight. Wet-weights were determined on *L. variegatus* before placing them in amber vials and freezing prior to body residue analysis. Weights were determined to 0.1 mg for all survivors.

During the tests, twice daily measurements were made of dissolved oxygen and temperature. pH and conductivity was measured several times throughout an exposure period. Total alkalinity, total hardness, ammonia, and non-purgeable organic carbon (NPOC) was measured at the beginning and end of the exposure period.

<u>Dilution Sediment Test</u>

Based upon the results of the initial *H. azteca* 28 day test there was no survival in Station SQT1 (a sand station) and low survival (6%) in SQT7 (a sand station). In order to verify this result and to better establish an effects threshold it was decided to make a serial dilution (100, 50, 25, 12.5%) of SQT1 volumetrically. It was decided not to dilute a woody site as toxicity was not observed. It was decided to make a serial dilution (100, 50, 25, 12.5%) of SQT1 volumetrically. Rather than dilute STQ1 with reference sediment because of the low reference stations survival, it was decided to make dilution sediment with a mixture of West Bearskin (WBS) and silica sand. The diluent tests were calculated as follows:

West Bearskin: 19.2 % solids, 7.0 % TOC
SQT1: 81.5% solids, 0.46% TOC

Therefore, the diluent sediment should contain 0.46% TOC and 81.5% solids. On a kg basis:

1000g (0.46%) = (X g) (7.0%)
X = 65.7 g dry WBS.

Therefore, silica sand = 1000g – 65.7 g= 934 g dry weight.

However, the WBS sediment exists as wet weight, so

65.7 g dry X (100g wet/19.2 g dry) = 342 g wet WBS

So, 934 g silica sand was mixed with 342 g wet WBS to yield a diluent containing 0.46% TOC on dry wt basis and 78.4% solids. The percent solids are lower unless we remove water from the WBS. This did not matter as when the sediment is placed into the beaker water was added. SQT1 and the dilution sediment were measured volumetrically into a mixing container where it was mixed and placed into the testing system as described above. *H. azteca* were the only organisms exposed to this dilution series. No additional time for equilibration between the SQT1 sediment and the diluent sediments was provided.

Ultraviolet (UV) Light Enhancement Toxicity Tests

Both *H. azteca* and *P. promelas* were exposed to UV light in a regime designed to replicate field conditions.

Field measurements of UV light

Prior to the UV-light exposure, UV-A (315-400 nm) and UV-B (280-315 nm) measurements were made at the Ashland harbor sites using an IL1700 International Light Research Radiometer/Photometer. Appropriate detectors, filters, and calibration factors corresponding to UV-A and UV-B wavelengths were used. The UV-light levels in Ashland Harbor were measured on 3 August 2005, which was a cloudy day and turbid water conditions were present. The second collection period, 31 August 2005, represented the clear sky day. On both sampling days measurements were taken at five different times (08:00, 10:00, 14:00, 16:00, 18:00 hrs), at the surface and three different depths (2 cm below the surface, mid-depth, and bottom) and at two different locations SQT1 (7.6 feet deep) and SQT2 (10.1 feet deep) at the Ashland site. UVA and UVB measurements were made at 10.0 cm intervals at one site to determine a rate of attenuation. Attempts to place the detector surface in the nepheloid layer were unsuccessful, so that the deepest readings were made slightly above the sediment-water interface. The results are summarized in Appendix Table 23. These data were submitted to URS who conferred with staff from the USEPA-Duluth laboratory (Dr. David Mount) to decide on an appropriate UV light regime. Since these UV measurements were made after the summer solstice and did not include solar noon, they were adjusted as recommended by Dr. Mount. Readings from the near bottom were selected for testing with *H. azteca* and mid-water readings were selected for testing with *P. promelas*. After significant discussion between URS and EPA-Duluth personnel, it was agreed to conduct a 10-day bioassay for *H. azteca* at 45 µW/cm^2 UVA and 0.4 µW/cm^2 UVB and a 7-day bioassay for the fatheads at a mid-depth exposure of 248 µW/cm^2 UVA and 6 µW/cm^2 UVB (Appendix 1).

<u>Laboratory Regime</u>

In the laboratory UV light bulbs (UV-A 340 bulbs, Q-panel Co.) were used to simulate field conditions. Measurements were taken at the beginning and the end of each UV exposure bioassay using the same meter as in the field and under the same exposure conditions (i.e., beakers present, overlying water present, glass covers present) as in the actual bioassay. Mean initial UVA and UVB readings for the *H.* azteca 10-d test were 44.9 µW/cm^2 and 3.79 µW/cm^2, respectively. The UVA lab exposure was very close to the desired field exposure condition. The UVB was higher than the desired exposure condition and likely due to spectral overlap between UVA and UVB. At the end of the 10-d *H. azteca* test the grand average for UVA was 42.4 µW/cm^2 and the grand average for UVB was 3.03 µW/cm^2. For the 7-d fathead exposure the following are the mean UVA and UVB intensities at the beginning of the exposure 238.0 µW/cm^2 and 18.2 µW/cm^2. Measurements were not taken at the end of the exposure. We used a constant intensity and a 16:8 light dark cycle. See Appendix 1 for rationale on UV bioassay exposure.

To determine the effect that avoidance behavior of UV light had on toxicity 4-5 1.0 cm leaf plugs were added to each beaker during the UV light exposure. Leafs were collected from the litter layer at Wisconsin Point Forest. One centimeter plugs were cut out of the leaves and allowed to soak in de-ionized water for four weeks. The water was changed weekly. The leaf plugs were autoclaved prior to addition to the exposure beakers.

<u>Statistical Analysis</u>

Data were analyzed using the SigmaStat® program (Jandel Corporration, 1995). Data analyses included: normality (Komogorov-Smirnov) testing, equal variance testing, one way analysis of variance (ANOVA), and a suite of tests for comparison between treatment means. Non-normal survival and weight data, when possible, were transformed using the arc sine-square root transformation (U.S. EPA 2000) to normalize the data. In some instances, data would not normalize after using different transformations. These data were analyzed using a non-parametric (Kruskal-Wallis or Dunn's Method) analysis of ranks. Data that passed the equal variance test used Tukey's test for all pairwise comparison tests. Mean percent survival and mean dry weight values for laboratory control sediments and the appropriate reference sediment were analyzed with a statistical significance level of 0.05. Abbott's formula for adjusting test mortality to control or reference mortality was employed to compare normal light and the UV light exposures. Statistical analyses raw data files are kept on file at the Lake Superior Research Institute and are available upon request.

Quality Assurance/Quality Control

Toxicity tests were initiated with healthy, vigorous animals. Reference toxicant tests were performed with all test species prior to the start of the definitive test. Control charts are available upon request. In the sediment toxicity tests, percent survival and dry weights of survivors in sand performance controls were compared to published test acceptability criteria (U.S.EPA, 2000) to determine the overall performance of the animals and the test system. Empty aluminum drying pans along with Class I standardized weights were used as a check for the organism drying process and the performance of the balance. Test conditions were monitored twice daily for parameters that might affect the outcome of the test (i.e., temperature, and dissolved oxygen). Daily and weekly calibration of test meters ensured optimal performance. Reference standards and duplicate samples were used in the analysis of ammonia, alkalinity, and hardness. The LSRI quality assurance and quality control manager performed inspections of logbooks, recorded measurements, and instrumentation used during the tests. Any deviations were discussed with the principal investigator and documented in the study logbook. The sediment studies were conducted with a high degree of quality assurance/quality control criteria.

RESULTS

Lumbriculus variegatus Bioaccumulation Study. A 96-hour toxicity screening was conducted prior to the start of the 28-d bioaccumulation study. The results from the 96-hour screening showed that sediments SQT7 and SQT1 were acutely toxic. These sediments were not used in the bioassay exposure. *L. variegatus* tissue was sent to Pace Analytical for PAH and lipid analysis. Summary results are reported in Appendix Table 2. A complete set of data with level four quality assurance and quality control has been previously submitted to URS. All tissue date are reported as μg/g wet weight.

Polycyclic aromatic hydrocarbon water concentration equilibrium study. A time series sampling of overlying water over fourteen days was used to determine partitioning and equilibration of PAHs from the sediment into the overlying water. Samples were collected and sent to Pace Analytical for analysis. Summary results are reported in two parts in Appendix Table 3 and 3.1. A complete set of data with level four quality assurance and quality control has been previously submitted to URS.

Hyalella azteca 28-d test (29 June to 27 July 2005). Mean percent survival (80.0-95.0 %) over the 28 days of exposure was high for animals exposed in the performance control sediments (silica sand, West Bearskin, and formulated sediment, Table 2). Reference sites SQT9 and SQT11 also had high mean percent survival (80.0-90.0, Table 2). Reference sites SQT10 and SQT12 had mean percent survivals of 40.0 ± 12.0 and 48.8 ± 29.5, respectively. Treatment sites ranged from 0.0 – 91.3 mean percent survival.

Treatments SQT1 and SQT7 mean percent survivals (0.0 and 6.3 ± 5.2, respectively) were significantly ($p < 0.05$) reduced when compared to the performance controls and reference sites SQT9 and SQT11 (Table 2). SQT3 mean percent survival (72.5 ± 8.9) was significantly ($p < 0.05$) reduced when compared to the performance controls of silica sand and West Bearskin. Statistical comparison was made using the reference sites SQT10 and SQT12. SQT1 and SQT7 were significantly ($p < 0.05$) reduced when compared to the reference sites of SQT10 and SQT12. The rest of the treatment sites had significantly great survival when compared to the reference sites SQT10 and SQT12. Individual survival counts are presented in Appendix Table 4.

Mean dry weight per individual ranged from 0.24 ± 0.05 mg to 0.49 ± 0.25 mg in the reference sediment and performance control treatments (Table 2). Average dry weight ranged from 0.26 ±0.04 mg to 0.42 ± 0.08 mg in the treatment sediments (Table 2). No significance difference at any Site station was detected at 95.0 % confidence. Individual growth measurements are presented in Appendix Table 4.

The mean percent survival of the performance control organisms (80.0-95.0 %) met test acceptability criteria of, where the criterion for acceptability is a mean survival level of 80.0 percent (U.S. EPA, 2000). The final mean values for the dry weights of the performance control (0.24-0.49 mg) for *H. azteca* are greater then the recommended value of 0.15 mg from several round robin tests (U.S. EPA, 2000). The measured values for the water quality characteristics indicate that the quality of the overlying water with regard to these characteristics was acceptable for tests with this species (U.S. EPA, 2000). Individual water characteristic measurements are presented in Appendix Table 5.

<u>*Hyalella azteca* 21-d test (12 August to 2 September 2005)</u>. A 21-day *H.azteca* test conducted as a repeat exposure to reference sites SQT10 and SQT12 which had experienced significant mortality in the initial *H. azteca* test. The 21-day test had acceptable survival (97.5 ± 4.6) in silica sand performance control (Table 3). Sand reference stations SQT10 and SQT12 had mean percent survivals of 50.0 ±18.5 and 76.3 ± 18.5, respectively (Table 3). These results were similar to the previous 28-d *H. azteca* test. Individual survival counts are presented in Appendix Table 6). The measured values for the water quality characteristics indicate that the quality of the overlying water with regard to these characteristics was acceptable for tests with this species (U.S. EPA, 2000). Individual water characteristic measurements are presented in Appendix Table 7.

<u>*Hyalella azteca* 28-d test (7 October to 4 November 2005)</u>. Because of low survival in the sand reference stations (SQT10 and SQT12) in the initial 28-day *H. azteca* bioassay, the bioassay was conducted again using sediments from two new sand reference stations (SQT13 and SQT14) collected in September. Mean percent survival ranged from 20.0 – 88.8 over the 10 days of exposure for animals exposed in the performance control sediments (silica sand, West Bearskin, and formulated sediment, Table 4). Traditionally at LSRI we have had low survival in the formulated sediment recommended by USEPA. Reference wood stations SQT9 and SQT11 had mean percent survivals of 65.0-85.0 (Table 4). New reference sand stations SQT13 and SQT14 had

mean percent survivals of 37.5 ± 21.9 and 52.5 ± 26.6, respectively (Table 4). Treatment sites ranged from 0.0 – 90.0 mean percent survival. Treatments SQT1 and SQT7 mean percent survivals (0.0 and 17.5, respectively) were significantly ($p < 0.05$) reduced when compared to the performance controls of silica sand and West Bearskin and reference sites SQT9 and SQT11 (Table 4). Statistical comparison was made using the reference sites SQT13 and SQT14 and the other treatments. All treatments sites with the exception of SQT1 and SQT7 had significantly greater survival. SQT1 and SQT7 were significantly ($p < 0.05$) reduced when compared to reference sites SQT13 and SQT14. Individual survival counts are presented in Appendix Table 8.

Mean dry weight per individual ranged from 0.24 ± 0.04 mg to 0.85 ± 0.14 mg in the reference sediment and performance control treatments (Table 4). Average dry weight ranged from 0.24 ±0.05 mg to 0.41 ± 0.18 mg in the treatment sediments (Table 4). SQT6 growth was significantly reduced ($p < 0.05$) when compared to the silica sand performance control. Individual growth measurements are presented in Appendix Table 8.

The mean percent survival of the performance control organisms (87.5-88.8) met the test acceptability criterion of 80.0 percent (U.S. EPA, 2000). The formulated performance control sediment was not used in determining test acceptability. The final mean values for the dry weights of the performance control (0.24-0.48 mg) for *H. azteca* are greater then the recommend value of 0.15 mg from several round robin tests (U.S. EPA, 2000). The measured values for the water quality characteristics indicate that the quality of the overlying water with regard to these characteristics was acceptable for tests with this species (U.S. EPA, 2000). Individual water characteristic measurements are presented in Appendix Table 9.

<u>*Hyalella azteca* 10-d test (3 January to 13 January 2006)</u>. These test results are from the sediment dilution of SQT1 and are the control (laboratory light) for the concurrently conducted UV light test. Mean percent survival ranged from 97.5 -100.0 over the 28 days of exposure for animals exposed in the performance control sediments (silica sand and West Bearskin Table 5). Reference sites SQT9 and SQT11 also had high mean percent survival (97.5 and 93.8, Table 5). The sediment used to dilute the sediment from SQT1 had 101.3 percent survival, Table 5. Treatment sites ranged from 0.0 – 97.5 mean percent survival. Treatments SQT1 had 0.0 percent survival which was significantly ($p < 0.05$) reduced when compared to the performance controls of silica sand and West Bearskin and reference sites SQT9, SQT11, and the dilution sediment (Table 5). The 50% dilution of SQT1 was also significantly ($p < 0.05$) reduced when compared to all of the performance controls and reference sediments (Table 5). No significant difference was detected in survival in the rest of the dilution (25% and 12.5%) of SQT1. SQT8 survival was also significantly ($p < 0.05$) reduced when compared to the silica sand and dilution sediment controls (Table 5). Individual survival counts are presented in Appendix Table 10.

Mean dry weight per individual ranged from 0.11 ± 0.01 mg to 0.18 ± 0.02 mg in the reference sediment and performance control treatments (Table 5). Average dry weight ranged from 0.10 ±0.01 mg to 0.19 ± 0.04 mg in the treatment sediments (Table 5). Only the 25% dilution of SQT1 had significantly reduced growth. Individual growth measurements are presented in Appendix Table 10.

The mean percent survival of the performance control organisms (97.5 – 100.0) met test acceptability of 80.0 percent (U.S. EPA, 2000). The final mean values for the dry weights of the performance control (0.11-0.15 mg) for *H. azteca* are very similar to the recommend value of 0.15 mg from several 28-d round robin tests (U.S. EPA, 2000). The measured values for the water quality characteristics indicate that the quality of the overlying water with regard to these characteristics was acceptable for tests with this species (U.S. EPA, 2000). Individual water characteristic measurements are presented in Appendix Table 11.

Hyalella azteca 10-d test UV light (3 January to 13 January 2006). These test results are from the sediment dilution of SQT1 and are exposed to UV light. In an additional treatment, beakers containing the same dilution sediment series also had 4-5 1.0 cm leaf plugs added to act as a form of detritus and provide refugia to the organisms. Mean percent survival ranged from 91.3 - 98.8 over the 10 days of exposure for animals exposed in the performance control sediments (silica sand, silica sand with leaf plugs, and West Bearskin Table 6). Reference sites SQT9 and SQT11 also had high mean percent survival (91.3 and 78.8, Table 6). The sediment used to dilute SQT1 sediment had 97.5 percent survival, Table 6. Treatment sites ranged from 0.0 – 95.0 mean percent survival. Treatments SQT1, 50% SQT1 with and with out leaf plugs, and 25% SQT1 with and with out leaf plugs were significantly ($p < 0.05$) reduced when compared to the performance controls of silica sand, silica sand with leaf plugs, West Bearskin and reference sites SQT9, SQT11, and the dilution sediment (Table 6). No significant difference was detected in survival in 12.5% SQT1 with and with out leaf plugs when compared to the performance controls and reference sites. SQT5 survival 40.0 ± 20.0 was also significantly ($p < 0.05$) reduced when compared to all of the performance control and reference sediments (Table 6). SQT4 survival (71.3 ± 12.5) was significantly ($p < 0.05$) reduced when compared to the silica sand with and with out leaf plugs and the dilution sediment (Table 6). Individual survival counts are presented in Appendix Table 12.

After applying Abbot's formula to correct for percent mortality in the silica sand control for both the UV and laboratory light the results are as follows: The 12.5% SQT1 with laboratory light and 12.5% SQT1 with UV light are significantly ($p < 0.05$) different from each other in the respects of survival, whereas, the 12.5 % SQT1 with laboratory light and 12.5% SQT1 with UV light and with leaf plugs are not significantly different. The 25.0 % SQT1 under UV light when compared to 25.0% SQT1 under laboratory light has significantly ($p < 0.05$) reduced survival. The 25% SQT1 with leaf plugs under UV light is significantly ($p < 0.05$) reduced when compared to the 25% SQT1 under laboratory light. However, the 25% SQT1 with leaf plugs had significantly greater survival when compared to the 25 % SQT1 without leaf plugs while both are exposed under UV light. The 50% SQT1 with and with out leaf plugs has significantly ($p < 0.05$) reduced survival when compared to the 50% SQT1 laboratory light exposed.

Mean dry weight per individual ranged from 0.11 ± 0.01 mg to 0.17 ± 0.03 mg in the reference sediment and performance control treatments (Table 6). Average dry weight ranged from 0.11 ±0.01 mg to 0.16 ± 0.03 mg in the treatment sediments (Table 6). Significant ($p < 0.05$) difference was detected in growth in treatments 12.5 % SQT1, 25 % SQT1, 25%SQT 1 with leaf plugs, SQT2, SQT4, and SQT5 (Table 6). Individual growth measurements are presented in Appendix Table 12.

The mean percent survival of the performance control organisms (91.3– 98.8) met test acceptability criterion of 80.0 percent (U.S. EPA, 2000). Currently there are no guidelines for test acceptability for a ten-day test The final mean values for the dry weights of the performance control (0.11-0.17 mg) for *H. azteca* are very similar to the recommend value of 0.15 mg from several 28-d round robin tests (U.S. EPA, 2000). The measured values for the water quality characteristics indicate that the quality of the overlying water with regard to these characteristics was acceptable for tests with this species (U.S. EPA, 2000). Individual water characteristic measurements are presented in Appendix Table 13.

<u>*Pimephales promelas* 7-d test (July 8-15, 2005)</u>. Mean percent survival ranged from 82.5 – 95.0 over the 7 days of exposure for animals exposed in the performance control sediments (silica sand, formulated sediment, and West Bearskin, Table 7). Reference sites SQT9, SQT10, SQT11, and SQT12 also had high mean percent survival (70.0-96.3, Table 7). No significant reduction in survival was detected over the 7 days of exposure. Individual survival counts are presented in Appendix Table 14.

Mean dry weight per individual ranged from 0.58 ± 0.07 mg to 0.75 ± 0.16 mg in the reference sediments and performance control treatments (Table 7). Average dry weight ranged from 0.47 ±0.06 mg to 0.71 ± 0.09 mg in the treatment sediments (Table 7). Significant ($p < 0.05$) decrease was detected in growth in treatment SQT1 relative to the silica sand performance control and the reference sediment SQT10, but not to the other control and reference sediments (Table 7). Individual growth measurements are presented in Appendix Table 14.

The mean percent survival of the performance control organisms (82.5 – 95.0) met test acceptability criterion of 80.0 percent (U.S. EPA, 2000). The final mean values for the dry weights of the performance control (0.58-0.71 mg), and all other treatments for *P. promelas* are greater than the recommended value of 0.25 mg (U.S. EPA, 2000). The measured values for the water quality characteristics indicate that the quality of the overlying water with regard to these characteristics was acceptable for tests with this species (U.S. EPA, 2000). Individual water characteristic measurements are presented in Appendix Table 15.

<u>*Pimephales promelas* 7-d test UV light (27 January 2006 – 2 February 2006)</u>. Mean percent survival ranged from 73.8 – 87.5 over the 7 days of exposure for animals exposed in the performance control sediments (silica sand, formulated sediment, and West Bearskin Table 8). Reference sites SQT9, SQT10, SQT11, and SQT12 also had high mean percent survival (73.8-82.5, Table 8). Treatments SQT7 and SQT1 had

significant ($p < 0.05$) reduction in survival (28.8 ±2.2 and 0.0, respectively) when compared to all of the performance controls and reference sediments (Table 8). Individual survival counts are presented in Appendix Table 16.

The survival data was corrected for percent mortality in the silica sand controls. The comparison was then made between survival of the laboratory light and UV light exposed bioassays. Treatment sites SQT7 and SQT1 exposed to UV light were significantly ($p < 0.05$) reduced when compared to the laboratory light exposed treatments.

Mean dry weight per individual ranged from 0.54 ± 0.09 mg to 0.59 ± 0.16 mg in the reference sediments and performance control treatments (Table 8). Average dry weight ranged from 0.45 ±0.11 mg to 0.63 ± 0.18 mg in the treatment sediments (Table 8). No significant ($p <0.05$) difference was detected in growth in treatments relative to the performance controls and the reference sediments (Table 8). Individual growth measurements are presented in Appendix Table 16.

The mean percent survival (81.3 and 87.5) of the performance control organisms in the silica sand and West Bearskin sediment met test acceptability criterion of 80.0 percent (U.S. EPA, 2000). The formulated sediment survival (73.8) is slightly below the U.S. EPA criterion of 80% (2000).The final mean values for the dry weights of the performance control (0.58-0.59 mg) and all treatments except SQT1 ( ) for *P. promelas* are greater than the recommended value of 0.25 mg (U.S. EPA, 2000). The measured values for the water quality characteristics indicate that the quality of the overlying water with regard to these characteristics was acceptable for tests with this species (U.S. EPA, 2000). Individual water characteristic measurements are presented in Appendix Table 17.

Chironomus dilutus early life stage test (10 February 2006 to 3 March 2006). Mean percent survival for animals exposed in the performance controls of silica sand and West Bearskin were 100.0 and 97.2, respectively (Table 9). Formulated sediment mean percent survival was 30.0 ± 20.0. The reference sediments SQT9, SQT11, SQT13, and SQT14 mean percent survival ranged from 3.0-30.0 (Table 9). Treatment SQT6 had a high mean percent survival of 96.0 (Table 9). The other treatments mean percent survivals ranged from 0.0-13.0 (Table 9). Statistical comparisons were made (Table 9). Individual survival counts are presented in Appendix Table 18.

Mean ash free dry weight was calculated and reported in Table 9. No statistical significance was detected due to the high variability in survival affecting the growth results. Individual growth measurements are presented in Appendix Table 19.

CONCLUSIONS

The Lake Superior Research Institute (LSRI) contracted with URS to evaluate the toxicity of sediments collected from several sites in Ashland Harbor, Ashland Wisconsin. The survival of *H. azteca* in the 29 June 2005 28 day experiment showed no survival in sites SQT1 and 6.3 percent survival in SQT7. These are both significantly reduced when compared to the performance control. There was less than 50 percent survival in two of the reference sediments (SQT10 and SQT12) provided. Data indicates that the low survival was not from experimental methods as the performance controls and other treatment sediment had high survival (> 80.0 %). Observations were made during homogenization of the sediment that a strong odor of decaying organic matter was detected. These stations both had slightly elevated levels of ammonia (Appendix Table 11). Both sediments also had the presence of snail shells noted during the homogenization. A repeat exposure of *H. azteca* to the same reference sediment was conducted to determine if the results were repeatable. The survival was very similar to the previous test. No significant difference was detected in growth in the original 28-d. *H. azteca* test. Due to the poor survival in reference sediments SQT10 and SQT12, new reference sediment was collected by URS staff.

After the collection of the new reference sediment (SQT13 and SQT14), another *H. azteca* 28-d test was conducted. Again, there was no survival in SQT1 and the survival in SQT7 was 17.5% which was significantly reduced when compared to the performance controls and reference sediments. The reference sediments SQT13 and SQT14 had low survival 37.5 and 52.5%, respectively. The test met acceptable performance criteria. Treatment survival results are very similar when compared to the first 28-d *H. azteca*. No differences in growth were detected when compared to the controls.

After examining the survival results of the *H. azteca* tests and the sediment chemistry it was decided by URS that a threshold level of total PAHs and mortality needed to be determined. This was accomplished by diluting SQT1, which had complete mortality, with non-toxic sediment. Table 5 shows that the highest SQT1 dilution (12.5%) had a 97.5% mean survival while the 50% dilution had 15.0 % mean survival. The 50% SQT1 and SQT1 had significant reduction in survival when compared to the performance and reference sediments. Based on the data in Table 5 the threshold value of survival lies somewhere between the 25% and 50% of sediment SQT1.

The same dilution regime as above was used in a bioassay along with UV light exposure. Some of the treatments also contained leaf plugs that provided potential refuge from the UV light (Table 6). Treatments 25% SQT1 with out and with leaf plugs, 50% SQT1 with out and with leaf plugs, 100% SQT1 with out and with leaf plugs, and SQT5 show a significant reduction in survival when compared to the performance controls and reference sediments. The general trend with the dilution series as mentioned above applies here also, as the SQT1 sediment percentage increases, survival decreases. It should also be noted that the survival in treatments 12.5% SQT1, 25% SQT1, 50% SQT1, SQT4 and SQT5 when exposed to UV light is reduced when compared to their non-UV exposed counterparts. It appears that leaf plugs do provide some protection from the UV light. Survival (78.8%) was reduced in 12.5% SQT1 without leaf plugs and was 95% in 12.5% SQT1 with leaf plugs. The same trend held true for the 25% SQT1 concentration. However, the 50% SQT1 concentration with and with out leaf plugs had 0.0 % survival.

There was no significant loss of survival or growth during the seven day exposure of fathead minnows to the sediment. The fish were unaffected by reference sediments SQT10 and SQT12 which had caused low survival in the *H. azteca* tests. However, when the fathead minnows were exposed to UV light and the same treatments as those exposed under standard laboratory lighting a significant reduction in survival was found in SQT7 and SQT1 when compared to the performance controls and reference sediments. No significant difference was detected in growth.

A general trend was observed in the *C. dilutus* early life stage test. Larval organisms are added to exposure beakers within four hours of them crawling out of the egg cases. The survival (97-100%) was high in the silica sand and West Bearskin performance controls. Survival (96.0 %) was also high in treatment SQT6. The rest of the treatments, including reference sediment, had low survival (recovery) (3-23 %). It was observed after several days into the test that treatments SQT7, SQT4, SQT3, and SQT5 and reference sediments SQT9, SQT11. SQT13, and SQT14 had animals that escaped out of the exposure beakers and were contained within the treatment box. It is believed that these larvae avoided the substrate from both Site and reference stations and remained planktonic in nature and were flushed out of the beaker during the renewal.

TABLES

Table 2 Average survival and dry weight of *Hyalella azteca* following 28 days of exposure to sediments from Ashland Harbor, 29 June 2005 to 27 July 2005. Standard deviations are in ( ).

Treatment	Average percent survival	Average dry weight (mg)
Silica Sand	95.0 (7.6)	0.49 (0.25)
Formulated Sediment	80.0 (10.7)	0.46 (0.07)
West Bearskin	95.0 (10.7)	0.24 (0.05)
SQT9	80.0 (16.9)	0.38 (0.08)
SQT10	40.0 (12.0) [abcde]	0.49 (0.07)
SQT11	90.0 (10.7)	0.23 (0.06)[b]
SQT12	48.8 (29.5) [abcde]	0.45 (0.23)
SQT6	91.3 (6.4)	0.28 (0.05)
SQT2	91.3 (15.5)	0.31 (0.06)
SQT7	6.3 (5.2) [abcdefg]	0.40 (0.34)
SQT4	95.0 (5.3)	0.26 (0.04)
SQT3	72.5 (8.9) [ac]	0.42 (0.08)
SQT5	91.3 (8.3)	0.33 (0.04)
SQT1	0.0 (0.0) [abcdefg]	0.00 (0.00)
SQT8	77.5 (17.5)	0.33 (0.06)

[a] Survival significantly reduced relative to the silica sand control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Kruskal-Wallis analysis of variance on ranks.

[b] Survival significantly reduced relative to the formulated sediment control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Kruskal-Wallis analysis of variance on ranks.

[c] Survival significantly reduced relative to the West Bearskin control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Kruskal-Wallis analysis of variance on ranks.

[d] Survival significantly reduced relative to the SQT9 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Kruskal-Wallis analysis of variance on ranks.

[e] Survival significantly reduced relative to the SQT11 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Kruskal-Wallis analysis of variance on ranks.

[f] Survival significantly reduced relative to the SQT10 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[g] Survival significantly reduced relative to the SQT12 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

Table 3. Average survival and dry weight of *Hyalella azteca* following 21 days of exposure to reference sediments from Ashland Harbor, 12 August 2005 to 2 September 2005. Standard deviations are in ( ).

Treatment	Average percent survival
Silica Sand	97.5 (4.6)
SQT10	50.0 (18.5)[acd]
SQT12	76.3 (18.5)
SQT5	81.3 (18.1)

[a] Survival significantly reduced relative to the silica sand control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[c] Survival significantly reduced relative to the SQT12 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[d] Survival significantly reduced relative to the SQT5 sediment by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

Table 4. Average survival and dry weight of *Hyalella azteca* following 28 days of exposure to sediments from Ashland Harbor, 7 October 2005 to 4 November 2005. Standard deviations are in ( ).

Treatment	Average percent survival	Average dry weight (mg)
Silica Sand	87.5 (8.9)	0.48 (0.09)
Formulated Sediment	20.0 (12.0)	0.85 (0.14)
West Bearskin	88.8 (15.5)	0.24 (0.04)
SQT9	65.0 (16.9)	0.37 (0.10)
SQT13	37.5 (21.9)	0.43 (0.09)
SQT11	85.0 (7.6)	0.26 (0.05)
SQT14	52.5 (26.6)	0.34 (0.12)
SQT6	90.0 (10.7)	0.24 (0.05)[a]
SQT2	83.8 (13.0)	0.31 (0.09)
SQT7	17.5 (16.7)[acdefg]	0.41 (0.18)
SQT4	90.0 (14.1)	0.26 (0.04)
SQT3	87.5 (10.4)	0.27 (0.02)
SQT5	81.3 (12.5)	0.26 (0.05)
SQT1	0.0 (0.0)[acdefg]	
SQT8	85.0 (9.3)	0.26 (0.04)

[a] Survival significantly reduced relative to the silica sand control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Dunn's Method of analysis of variance.

[b] Survival significantly reduced relative to the formulated sediment control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Dunn's Method of analysis of variance.

[c] Survival significantly reduced relative to the West Bearskin control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Dunn's Method of analysis of variance.

[d] Survival significantly reduced relative to the SQT9 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Dunn's Method of analysis of variance.

[e] Survival significantly reduced relative to the SQT11 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Dunn's Method analysis of variance.

[f] Survival significantly reduced relative to the SQT13 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses

[g] Survival significantly reduced relative to the SQT14 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses

Table 5. Average survival and dry weight of *Hyalella azteca* following 10 days of exposure to sediments from Ashland Harbor, 3 January 2006 to 13 January 2006. Standard deviations are in ( ).

Treatment	Average percent survival	Average dry weight (mg)
Silica Sand	100 (0.0)	0.15 (0.02)
West Bearskin	97.5 (7.1)	0.11 (0.01)
Dilution Sediment	101.3 (8.3)	0.11 (0.02)
SQT9	97.5 (4.6)	0.18 (0.02)
SQT11	93.8 (7.4)	0.13 (0.01)
12.5% SQT1	97.5 (4.6)	0.12 (0.02)
25 % SQT1	82.5 (34.5)	0.10 (0.01)[d]
50% SQT1	15.0 (10.7)[abcde]	0.12 (0.07)
SQT1	0.0 (0.0)[abcde]	
SQT2	92.5 (7.1)	0.13 (0.02)
SQT4	93.8 (5.2)	0.18 (0.02)
SQT5	92.5 (10.4)	0.18 (0.03)
SQT8	73.8 (32.0)[ac]	0.19 (0.04)

[a] Survival significantly reduced relative to the silica sand control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[b] Survival significantly reduced relative to the West Bearskin control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[c] Survival significantly reduced relative to the dilution sediment control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[d] Survival significantly reduced relative to the SQT9 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by Dunn's Method of analysis of variance.

[e] Survival significantly reduced relative to the SQT11 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

Table 6. Average survival and dry weight of *Hyalella azteca* following 10 days of exposure to sediments from Ashland Harbor and UV light, 3 January 2006 to 13 January 2006. Standard deviations are in ( ).

Treatment	Average percent survival	Average dry weight (mg)
Silica Sand	98.8 (9.9)	0.12 (0.02)
Silica Sand and Leaf Plugs	98.8 (9.9)	0.17 (0.03)
West Bearskin	91.3 (6.4)	0.11 (0.01)
Dilution Sediment	97.5 (4.6)	0.11 (0.01)
SQT9	91.3 (11.3)	0.16 (0.03)
SQT11	78.8 (12.5)	0.12 (0.02)
12.5% SQT1	78.8 (21.0)	0.12 (0.04)[b]
12.5% SQT1and Leaf Plugs	95.0 (7.6)	0.16 (0.02)
25 % SQT1	11.3 (14.6)[abcdef]	0.11 (0.03)[b]
25% SQT1 and Leaf Plugs	55.0 (17.7)[abcdef]	0.12 (0.03)[b]
50% SQT1	0.0 (0.0)[abcdef]	
50% SQT1 and Leaf Plugs	0.0 (0.0)[abcdef]	
SQT1	0.0 (0.0)[abcdef]	
SQT1 and Leaf Plugs	0.0 (0.0)[abcdef]	
SQT2	91.3 (8.3)	0.12 (0.02)[b]
SQT4	71.3 (12.5)[abd]	0.11 (0.02)[be]
SQT5	40.0 (20.0)[abcdef]	0.12 (0.03)[b]
SQT8	86.3 (16.0)[a]	0.16 (0.03)

[a] Survival significantly reduced relative to the silica sand control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[b] Survival significantly reduced relative to the silica sand and leaf plug control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Dunn's Method of analysis of variance.

[c] Survival significantly reduced relative to the West Bearskin control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[d] Survival significantly reduced relative to the dilution sediment control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[e] Survival significantly reduced relative to the SQT9 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses or mean growth significantly reduced by one-way ANOVA and Dunn's Method of analysis of variance.

[f] Survival significantly reduced relative to the SQT11 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

Table 7. Average survival and dry weight of *Pimephales promelas* following 7 days of exposure to sediments from Ashland Harbor, July 8-15, 2005. Standard deviations are in ( ).

Treatment	Average percent survival	Average dry weight (mg)
Silica Sand	95.0 (7.6)	0.71 (0.13)
Formulated Sediment	91.3 (6.4)	0.58 (0.07)
West Bearskin	82.5 (16.7)	0.67 (0.31)
SQT9	70.0(27.3)[abg]	0.67 (0.19)
SQT10	96.3 (5.2)	0.75 (0.16)
SQT11	90.0 (7.6)	0.61 (0.06)
SQT12	93.8 (5.2)	0.63 (0.06)
SQT6	93.8 (7.4)	0.57 (0.13)
SQT2	90.0 (10.7)	0.67 (0.10)
SQT7	90.0 (7.6)	0.54 (0.10)
SQT4	91.3 (8.3)	0.54 (0.06)
SQT3	82.5 (14.9)	0.63 (0.16)
SQT5	93.8 (9.2)	0.71 (0.09)
SQT1	76.3 (13.0)	0.47 (0.06)[ae]
SQT8	93.8 (7.4)	0.68 (0.07)

[a] Survival or growth significantly reduced relative to the silica sand control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[b] Survival significantly reduced relative to the formulated sediment control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[c] Survival significantly reduced relative to the West Bearskin control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[d] Survival significantly reduced relative to the SQT9 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[e] Survival or growth significantly reduced relative to the SQT10 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[f] Survival significantly reduced relative to the SQT11 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[g] Survival significantly reduced relative to the SQT12 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

Table 8. Average survival and dry weight of *Pimephales promelas* exposure to sediments from Ashland Harbor and UV light, 27 January 2006 to 2 February 2006. Standard deviations are in ( ).

Treatment	Average percent survival	Average ash free dry weight (mg)
Silica Sand	81.3 (1.2)	0.54 (0.09)
Formulated Sediment	73.8 (1.9)	0.57 (0.07)
West Bearskin	87.5 (0.9)	0.59 (0.16)
SQT9	82.5 (1.7)	0.68 (0.10)
SQT13	78.8 (1.2)	0.54 (0.15)
SQT11	73.8 (1.2)	0.64 (0.13)
SQT14	81.3 (2.0)	0.67 (0.04)
SQT6	77.5 (1.8)	0.62 (0.09)
SQT2	75.0 (1.9)	0.56 (0.07)
SQT7	38.8 (2.2)[abcdefg]	0.63 (0.18
SQT4	61.3 (1.5)	0.50 (0.11)
SQT3	68.8 (2.9)	0.45 (0.11)
SQT5	60.0 (1.5)	0.58 (0.09)
SQT1	0.0 (0.0)[abcdefg]	
SQT8	71.3 (1.4)	0.61 (0.08)

[a] Survival significantly reduced relative to the silica sand control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[b] Survival significantly reduced relative to the formulated sediment control by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

c Survival significantly reduced relative to the West Bearskin reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[d] Survival significantly reduced relative to the SQT9 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

[e] Survival significantly reduced relative to the SQT13 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

f Survival significantly reduced relative to the SQT11 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

g Survival significantly reduced relative to the SQT14 reference by one-way ANOVA and Tukey's pairwise comparisons of the mean responses.

Table 9. Average survival and ash free dry weight of *Chironomus dilutus* early life stage exposure to sediments from Ashland Harbor, 10 February 2006 to 3 March 2006. Standard deviations are in ( ).

Treatment	Average percent survival	Average ash free dry weight (mg)
Silica Sand	100 (17.7)	0.86 (0.14)
Formulated Sediment	30 (20.0)	1.50 (0.81)
West Bearskin	97 (9.2)	1.23 (0.07)
SQT9	17 (27.8)	2.50 (1.56)
SQT13	23 (28)	2.44 (0.54)
SQT11	3 (7.4)	1.50
SQT14	30 (28.2)	2.58 (0.80)
SQT6	96 (16.0)	1.23 (0.12)
SQT2	0 (0)[abc]	
SQT7	4 (10.7)[abc]	2.90
SQT4	7 (9.9)[ab]	2.50 (0.26)
SQT3	13 (12.0)[ab]	3.37 (0.73)
SQT5	6 (11.7)[abc]	
SQT1	1 (3.5)[abc]	
SQT8	1 (3.5)[abc]	

[a] Survival significantly reduced relative to the silica sand control by one-way ANOVA and Tukey’s pairwise comparisons of the mean responses.

[b] Survival significantly reduced relative to the West Bearskin control by one-way ANOVA and Tukey’s pairwise comparisons of the mean responses.

c Survival significantly reduced relative to the SQT14 reference by one-way ANOVA and Tukey’s pairwise comparisons of the mean responses.

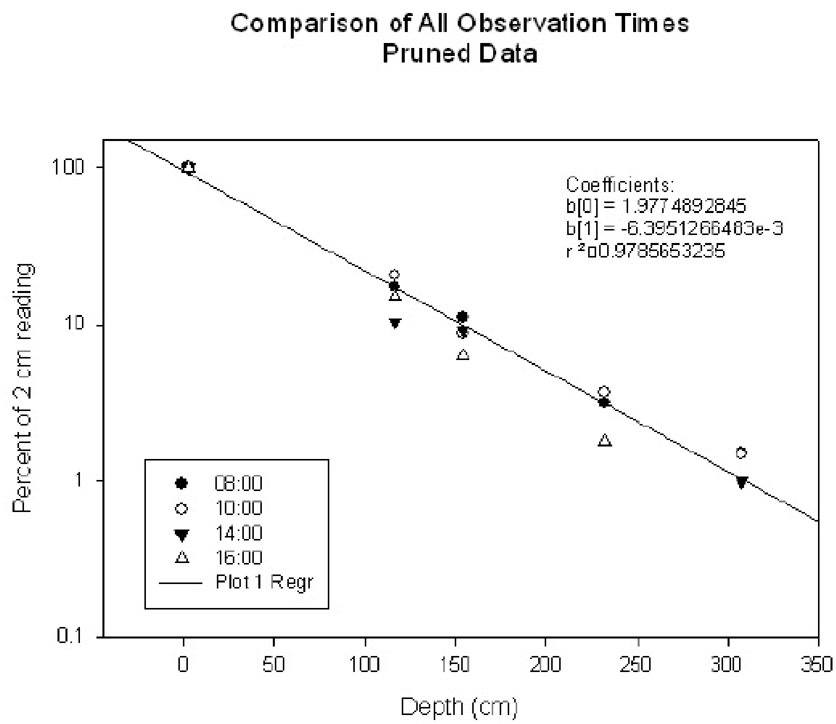
APPENDICES

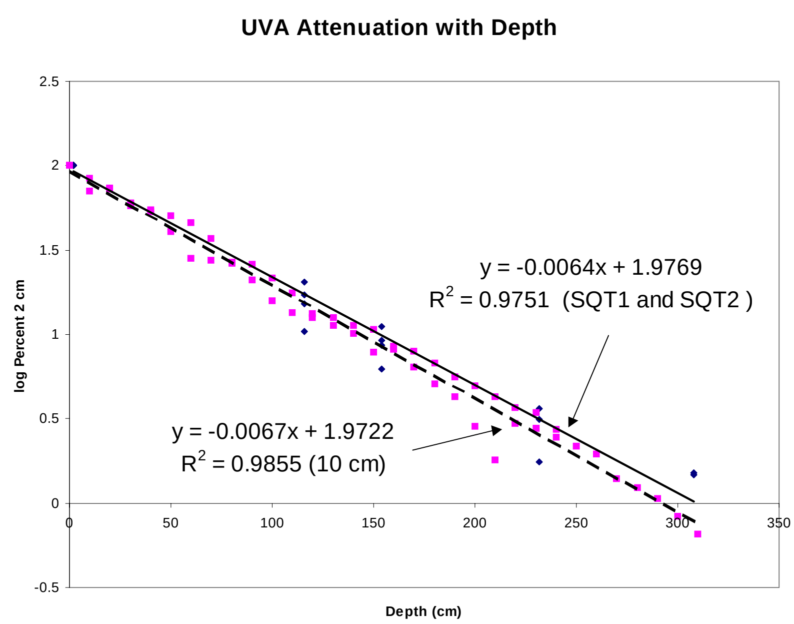
APPENDIX 1

UV Exposure for
Ashland Sediment Tests

UV Exposure for Ashland Sediment Tests

Following your suggestion, here is what we did. First of all we compared your censured attenuation curve (from your 12.15.05 memo) to our data from 10 cm intervals.



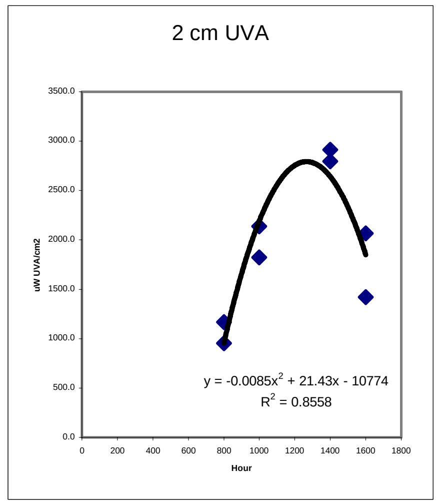


Presumably, the minor differences from your regression of the censured SQT1 and SQT2 you had in your memo likely results from us using Excel. The fact that the rate of attenuation in the 10 cm readings is similar to what you calculated provides some validation of the approach you used.

We then re-visited the data, censured some of the data you discussed and again fitted them to a parabolic curve. Here is what Darrel got.

	Time	2 cm
SQT1	800	1166.8
	1000	1822.8
	1400	2795.0
	1600	1419.3
SQT2	800	954.3
	1000	2136.8
	1400	2914.5
	1600	2066.8

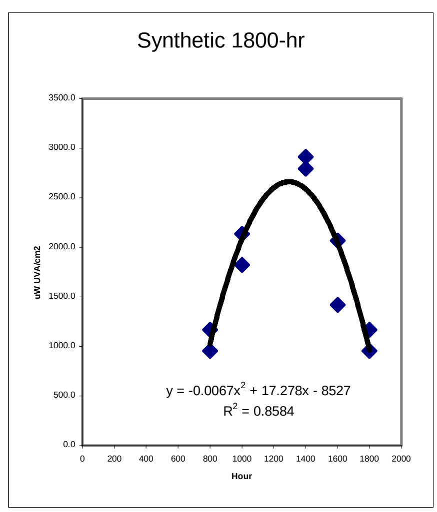
4 data sets only (no 1800 data)



As you suggested we then set the 1800 data equal to the 0800 data (note that we can't be sure the anomalies you point out in the 1800 data are not real since the same results were seen in the cloudy day data. Could this reflect the low angle of the sun?). Nevertheless we did this, fit it to a curve and estimated a mean irradiance at 2cm depth over a 16 hour period.

	Time	2 cm
SQT1	800	1166.8
	1000	1822.8
	1400	2795.0
	1600	1419.3
	1800	1166.8
SQT2	800	954.3
	1000	2136.8
	1400	2914.5
	1600	2066.8
	1800	954.3

with 1800-hr data=0800-hr data



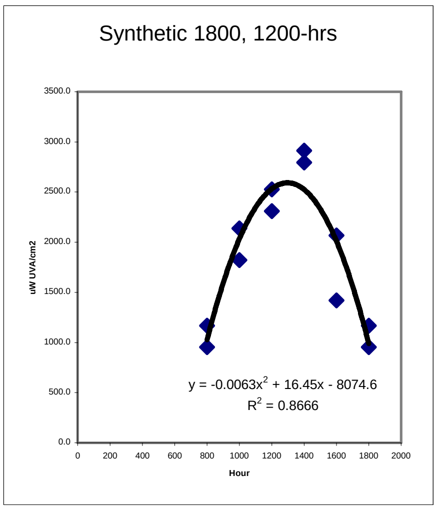
Using the resulting equation, we then estimated UVA over a 16-hour period. Where negative values were predicted, we entered zeros, and calculated the average irradiance.

Hours	Time	uW UVA/cm^2	uW UVA/cm^2
0	600	-572.2	0
2	800	1007.4	1007.4
4	1000	2051	2051
6	1200	2558.6	2558.6
8	1400	2530.2	2530.2
10	1600	1965.8	1965.8
12	1800	865.4	865.4
14	2000	-771	0
16			0
		average=	1372.3

For comparison we also “plugged” an estimated 1200 value using the of the 1000 and 1400 data (assumes a symmetrical curve). This resulted in somewhat greater average irradiance.

	Time	2 cm
SQT1	800	1166.8
	1000	1822.8
	1200	2308.9
	1400	2795.0
	1600	1419.3
SQT2	1800	1166.8
	800	954.3
	1000	2136.8
	1200	2525.6
	1400	2914.5
	1600	2066.8
	1800	954.3

with 1200-hr data=average 1000+1400-hr



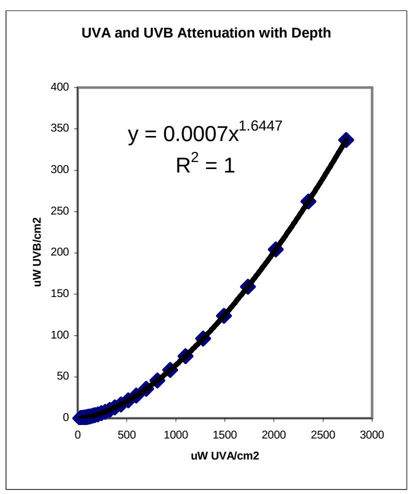
We then recalculated the 16-hr. average irradiance as before.

	uW UVA/cm^2	uW UVA/cm^2
600	-472.6	0
800	1053.4	1053.4
1000	2075.4	2075.4
1200	2593.4	2593.4
1400	2607.4	2607.4
1600	2117.4	2117.4
1800	1123.4	1123.4
2000	-374.6	0
		0
	average=	1446.3

Using this and the attenuation regression equation, the following results for the mid-depth and bottom of SQT1 (the shallowest station) were obtained:

Depth	uW UVA/cm^2		uW UVA/cm^2	
cm	2 cm	% 2 cm	Mid	Bottom
115.8	1446.3	17.2	249	
231.6	1446.3	3.1		45

We also collected UVB data at 10 cm intervals at the Site and, as shown below, we calculated an equation by which we could estimate UVB from UVA light at different depths.



Using this equation, the values for UVB were calculated at the SQT1 mid and bottom depths.

Depth	Mid		Bottom	
cm	uW UVA/cm^2	uW UVB/cm^2	uW UVA/cm^2	uW UVB/cm^2
115.8	249	6		
231.6			45	0.4

These results were then adjusted for Summer Solstice using the 33% higher irradiance expected on that day. This resulted in the following estimates:

Depth	Mid		Bottom	
cm	uW UVA/cm^2	uW UVB/cm^2	uW UVA/cm^2	uW UVB/cm^2
115.8	331	8		
231.6			60	0.5

Following your proposal we then adjusted these "clear sky" estimates for partly cloudy weather using the 75% adjustment factor you proposed.

Depth	Mid		Bottom	
cm	uW UVA/cm^2	uW UVB/cm^2	uW UVA/cm^2	uW UVB/cm^2
115.8	248	6		
231.6			45	0.4

Assuming you agree with what we have done this, I gather from your memo you are proposing that we could conduct the UV bioassays for 10-days with mid depth exposure of 248 μW/cm^2 UVA and 6 μW/cm^2 UVB. The *Hyalella* test will be conducted at 45 μW/cm^2 UVA and 0.4 μW/cm^2 UVB. It would be our intention to use a constant intensity and a 16:8 light dark cycle.

I will discuss the "depth-indexing" once more with Xcel on Thursday before we finalize the UV regime. I will recommend we simulate conditions at Station SQT 1.

APPENDIX 2

PAH Concentrations in *L. variegatus* From Ashland Sediment Bioaccumulation Study

PAH Concentrations in *Lumbriculus variegatus* from Ashland Sediment Bioaccumulation Study

Compound	SQT9-1	SQT9-2	SQT9-3	SQT9-4	SQT10-1	SQT10-2	SQT10-3	SQT10-4	SQT11-1&2	SQT11-3&4
1-Methylnaphthalene	5.6	<4.3	4.1	3.4	3.1	3.2	3.5	<3.4	<4.3	<4.0
1-Methylphenanthrene	19	12	15	20	<5.8	<7.4	<7.4	<9.2	<12	<11
2,3,5-Trimethylnaphthalene	<8.6	<8.1	<5.4	<6.1	<4.1	<5.2	<5.3	<6.5	<8.2	<7.7
2,6-Dimethylnaphthalene	<17	<16	<10	<12	<8.0	<10	<10	<13	<16	<15
2-Methylnaphthalene	10	<4.5	5.7	5.5	6.5	6.2	6.9	<3.6	7.3	5.0
Acenaphthene	9.3	<6.9	6.2	5.4	5.9	6.6	7.2	<5.5	7.8	<6.5
Acenaphthylene	<14	<13	<8.9	<9.9	<6.8	<8.6	<8.7	<11	<13	<13
Anthracene	42	<13	<8.4	<9.4	<6.4	<8.1	<8.2	<10	<13	<12
Benzo(a)anthracene	17	<15	<10	<11	<7.8	<9.9	<10	<12	<15	<15
Benzo(a)pyrene	<18	<17	<12	<13	<8.8	<11	<11	<14	<17	<16
Benzo(b)fluoranthene	<15	<14	<9.3	<10	7.2	<8.9	<9.0	<11	<14	<13
Benzo(e)pyrene	<13	<12	<8.3	<9.3	7.2	<8.0	<8.1	<10	<13	<12
Benzo(ghi)perylene	<14	<14	<9.1	<10	7.6	<8.8	<8.9	<11	<14	<13
Benzo(k)fluoranthene	<12	<11	80	41	7.5	<7.2	<7.2	<8.9	17	59
Chrysene	<13	<13	<8.4	<9.5	11	9.9	9.4	<10	<13	12
Dibenz(a,h)anthracene	<14	<13	<8.6	<9.6	<6.6	<8.3	<8.4	<10	<13	<12
Fluoranthene	39	<12	10	10	24	21	24	<9.8	33	31
Fluorene	13	<7.9	5.4	<5.9	<4.0	<5.1	<5.1	<6.3	8.6	<7.4
Indeno(1,2,3-cd)pyrene	<14	<13	<8.7	<9.7	<6.6	<8.4	<8.5	<10	<13	<12
Naphthalene	23	<5.2	14	19	16	17	19	5.8	17	13
Perylene	31	<24	59	24	<12	<15	<15	<19	37	36
Phenanthrene	110	60	62	66	79	75	82	<9.1	100	71
Pyrene	30	<14	<9.2	<10	20	17	18	<11	23	30
% Lipids	1.74	1.65	1.42	1.74	1.92	1.63	1.56	0.05	0.35	1.95

PAH Concentrations in *Lumbriculus variegatus* from Ashland Sediment Bioaccumulation Study

Compound	SQT12-1	SQT12-2	SQT12-3	SQT12-4	SQT2-1	SQT2-2	SQT2-3	SQT2-4	SQT4-1	SQT4-2&4	SQT4-3
1-Methylnaphthalene	<3.1	<4.0	3.6	2.8	8	9.3	<6.1	4.1	<4.5	4.1	4.4
1-Methylphenanthrene	<8.4	<11	<8.1	<6.8	19	17	<16	26	41	44	57
2,3,5-Trimethylnaphthalene	<5.9	<7.6	<5.8	<4.8	<11	<12	<12	<7.5	<8.5	6.1	12
2,6-Dimethylnaphthalene	<12	<15	<11	<9.4	<21	<23	<22	<15	<17	<11	<11
2-Methylnaphthalene	6.0	6.2	6.4	5.8	9.1	8.8	<6.4	7.4	8.4	8.3	7.1
Acenaphthene	6.6	<6.4	7.0	5.6	<8.9	<9.9	<9.8	7.7	<7.2	11	8.0
Acenaphthylene	<9.7	<12	13	<7.9	<17	<19	<19	<12	17	65	52
Anthracene	<9.2	<12	<9.0	<7.5	<16	<18	<18	<12	20	33	41
Benzo(a)anthracene	12	<14	<11	9.7	51	47	31	58	310	440	450
Benzo(a)pyrene	<13	<16	<12	<10	36	38	<25	46	<18	380	380
Benzo(b)fluoranthene	14	<13	<9.9	13	30	27	<20	34	170	260	290
Benzo(e)pyrene	14	<12	13	11	41	37	23	44	190	250	260
Benzo(ghi)perylene	<10	<13	<9.7	<8.1	32	29	<19	30	62	96	96
Benzo(k)fluoranthene	12	26	95	8.3	66	130	33	47	260	310	300
Chrysene	20	15	16	16	61	52	38	67	330	400	410
Dibenz(a,h)anthracene	<9.4	<12	<9.2	<7.7	<17	<19	<18	<12	14	20	20
Fluoranthene	32	22	21	21	67	61	41	72	290	350	400
Fluorene	8.8	<7.3	8.8	<4.7	<10	<11	<11	10	<8.3	13	8.4
Indeno(1,2,3-cd)pyrene	<9.5	<12	<9.2	<7.8	<17	<19	<19	<12	44	65	66
Naphthalene	15	16	15	14	22	23	18	18	20	16	15
Perylene	28	73	61	<14	<31	<34	<34	30	<25	<17	50
Phenanthrene	89	100	76	76	120	110	65	79	110	120	130
Pyrene	24	13	13	14	77	89	72	130	410	640	710
% Lipids	1.46	1.66	1.61	1.59	2.23	1.62	2.25	2.09	1.15	1.86	2.17

PAH Concentrations in *Lumbriculus variegatus* from Ashland Sediment Bioaccumulation Study

Compound	SQT3-1	SQT3-2	SQT3-3&4	SQT5-1	SQT5-2&3&4	SQT8-1&2	SQT8-3&4	SQT6-1	SQT6-2&4	SQT6-3
1-Methylnaphthalene	<5.6	<5.7	<4.1	5.5	5.9	19	9.5	<4.3	<4.2	<5.1
1-Methylphenanthrene	68	67	59	230	160	13	15	<11	<11	<14
2,3,5-Trimethylnaphthalene	14	<11	10	81	46	9.3	11	<8.1	<8.0	<9.6
2,6-Dimethylnaphthalene	<21	<21	<15	34	18	21	18	<16	<16	<19
2-Methylnaphthalene	8.4	14	6.9	13	12	35	15	4.6	5.0	6.7
Acenaphthene	<9.0	<9.1	<6.5	28	16	28	29	<6.8	<6.8	<8.2
Acenaphthylene	59	54	51	200	150	71	99	<13	<13	19
Anthracene	48	53	42	230	140	<14	15	<13	<13	<15
Benzo(a)anthracene	500	520	500	1500	1300	34	37	66	71	84
Benzo(a)pyrene	460	480	470	1300	190	<19	24	72	81	100
Benzo(b)fluoranthene	310	290	320	840	710	<15	18	52	55	67
Benzo(e)pyrene	310	300	290	770	640	20	24	62	68	80
Benzo(ghi)perylene	130	120	120	350	310	<15	16	25	28	33
Benzo(k)fluoranthene	380	360	340	970	810	35	100	64	71	110
Chrysene	460	470	450	1200	960	35	40	80	84	97
Dibenz(a,h)anthracene	29	26	25	98	92	<14	<12	<13	<13	<15
Fluoranthene	480	500	460	1500	1100	55	65	58	60	71
Fluorene	<10	11	<7.5	51	30	16	25	<7.8	<7.8	10
Indeno(1,2,3-cd)pyrene	91	87	84	290	260	<14	<12	<13	15	17
Naphthalene	19	24	15	22	19	43	27	13	14	17
Perylene	70	60	51	190	160	<25	<22	31	97	<28
Phenanthrene	130	120	120	560	350	120	150	76	84	96
Pyrene	810	870	790	2600	1900	80	92	110	110	130
% Lipids	0.54	1.55	1.24	1.50	2.32	1.84	2.24	1.36	0.88	1.55

PAH Concentrations in *Lumbriculus variegatus* from Ashland Sediment Bioaccumulation Study

Compound	FORM-1	FORM-2	FORM-3	FORM-4	W. Bear-1	W. Bear-2&3	W.Bear-4	Initial	Initial Duplicate
1-Methylnaphthalene	4.2	3.4	5.0	2.7	<4.8	4.4	<4.3	3.6	2.6
1-Methylphenanthrene	<7.1	<7.1	<7.8	<7.0	<13	<10	<11	2.8	2.9
2,3,5-Trimethylnaphthalene	<5.0	<5.0	<5.6	<5.0	<9.2	<7.4	<8.1	2.7	2.5
2,6-Dimethylnaphthalene	<9.7	<9.7	<11	<9.6	<18	<14	<16	1.7	1.6
2-Methylnaphthalene	8.1	6.7	7.2	5.5	<5.1	6.4	<4.5	6.7	5.3
Acenaphthene	9.4	7.3	6.9	5.9	<7.8	<6.2	<6.9	6.1	5.6
Acenaphthylene	9.2	<8.2	9.8	<8.1	<15	<12	<13	<1.1	<1.3
Anthracene	<7.8	<7.8	37	<7.7	<14	<11	<13	4.3	3.2
Benzo(a)anthracene	<9.5	<9.5	<11	<9.4	<17	<14	<15	1.7	1.5
Benzo(a)pyrene	<11	<11	<12	<11	<20	<16	<17	<1.4	<1.7
Benzo(b)fluoranthene	<8.6	<8.6	<9.5	<8.5	<16	<13	<14	<1.1	<1.3
Benzo(e)pyrene	<7.7	<7.7	<8.5	<7.6	<14	<11	<12	1.8	1.6
Benzo(ghi)perylene	<8.4	<8.4	<9.3	<8.3	<15	<12	<14	1.7	1.5
Benzo(k)fluoranthene	89	<6.9	<7.6	<6.8	<13	<10	42	<0.91	<1.1
Chrysene	<7.8	<7.8	<8.7	<7.7	<14	<11	<13	3.4	3.1
Dibenz(a,h)anthracene	<8.0	<8.0	<8.8	<7.9	<15	<12	<13	<1.1	<1.2
Fluoranthene	32	18	25	15	<14	<11	<12	8.7	9.2
Fluorene	42	17	6.9	16	<8.9	<7.1	9.6	4.2	3.2
Indeno(1,2,3-cd)pyrene	<8.0	<8.0	<8.9	<7.9	<15	<12	<13	<1.1	<1.2
Naphthalene	21	17	23	14	16	17	9.5	15	11
Perylene	<15	<15	<16	16	<27	<21	<24	<1.9	<2.2
Phenanthrene	100	98	83	69	56	72	57	64	65
Pyrene	13	<8.5	11	<8.4	<16	<13	<14	7.9	7.7
% Lipids	1.95	1.57	2.11	2.59	1.32	1.68	1.03	2.45	2.43

APPENDIX 3

Pace Analytical Report
PAH Water Only Equilibrium Study

Pace Analytical Services, Inc.

Analytical Report Number: 862425

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J - 48 HR

Matrix Type : WATER
Collection Date : 08/04/05
Report Date : 08/23/05
Lab Sample Number : 862425-001

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/11/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.8	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.1	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.0	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene		5.5	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862425

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J DUP - 48 HR

Matrix Type : WATER
Collection Date : 08/04/05
Report Date : 08/23/05
Lab Sample Number : 862425-002

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/11/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.9	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene		4.7	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862425

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - 48 HR

Matrix Type : WATER
Collection Date : 08/04/05
Report Date : 08/23/05
Lab Sample Number : 862425-003

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/11/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene		6.7	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862425

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O DUP - 48 HR

Matrix Type : WATER
Collection Date : 08/04/05
Report Date : 08/23/05
Lab Sample Number : 862425-004

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/11/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene		5.7	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862425

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J - DAY 4

Matrix Type : WATER
Collection Date : 08/06/05
Report Date : 08/23/05
Lab Sample Number : 862425-005

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/11/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene		2.0	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.1	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.0	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene		5.8	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862425

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J DUP - DAY 4

Matrix Type : WATER
Collection Date : 08/06/05
Report Date : 08/23/05
Lab Sample Number : 862425-006

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/11/05

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	< 1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	2.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	2.8	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	< 1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	< 1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	2.2	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	2.8	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	1.9	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	2.7	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene	7.1	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	< 1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	4.2	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	2.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862425

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - DAY 4

Matrix Type : WATER
Collection Date : 08/06/05
Report Date : 08/23/05
Lab Sample Number : 862425-007

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/11/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene		5.7	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862425

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O DUP - DAY 4

Matrix Type : WATER
Collection Date : 08/06/05
Report Date : 08/23/05
Lab Sample Number : 862425-008

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/11/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.2	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.2	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.0	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Naphthalene		7.0	1.7	1	ug/L	B&	08/14/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/14/05	SW846 3510C	8270C-SIM
Phenanthrene		1.7	1.7	1	ug/L	&*	08/14/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862259

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J - 0HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-001

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	8.3	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	2.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	8.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	2.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene	6.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	3.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	13	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862259

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J DUP - 0HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-002

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene		7.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene		8.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		5.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		3.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		13	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - 0HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-003

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		3.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862259

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O DUP - 0HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-004

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		2.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene		2.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		5.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		3.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J - 2HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-005

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene		3.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene		5.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		3.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		7.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J DUP - 2HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-006

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene		4.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene		6.4	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		8.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		4.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		8.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - 2HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-007

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		2.3	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O DUP - 2HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-008

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		5.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

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1241 Bellevue Street
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920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J - 4HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-009

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene		3.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.3	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		5.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

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Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J DUP - 4HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-010

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene		7.4	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene		1.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		3.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene		6.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		3.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		11	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

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Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - 4HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-011

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		5.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

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Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O DUP - 4 HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-012

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		7.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

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Green Bay, WI 54302
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Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J - 8HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-013

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	2.4	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	2.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	4.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene	6.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	7.4	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862259

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J DUP - 8HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-014

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene		6.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		3.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene		6.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		11	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862259

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client :	LAKE SUPERIOR RESEARCH INSTITUTE	**Matrix Type :**	WATER
Project Name :	ASHLAND - PAH EQUILIBRIUM	**Collection Date :**	08/02/05
Project Number :		**Report Date :**	08/23/05
Field ID :	O - 8HR	**Lab Sample Number :**	862259-015

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	1.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene	4.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	< 1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
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920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O DUP - 8HR

Matrix Type : WATER
Collection Date : 08/02/05
Report Date : 08/23/05
Lab Sample Number : 862259-016

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		3.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene		3.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.4	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		3.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J - 24HR

Matrix Type : WATER
Collection Date : 08/03/05
Report Date : 08/23/05
Lab Sample Number : 862259-017

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		5.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		2.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : J DUP - 24HR

Matrix Type : WATER
Collection Date : 08/03/05
Report Date : 08/23/05
Lab Sample Number : 862259-018

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene		1.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.9	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		5.0	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene		3.6	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862259

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - 24HR

Matrix Type : WATER
Collection Date : 08/03/05
Report Date : 08/23/05
Lab Sample Number : 862259-019

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.4	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.3	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.3	1.7	1	ug/L	&N	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		3.5	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 862259

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - 24HRMS

Matrix Type : WATER
Collection Date : 08/03/05
Report Date : 08/23/05
Lab Sample Number : 862259-020

SEMIVOLATILES - SPECIAL LIST - SIM **Prep Date:** 08/09/05

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	45	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	51	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	53	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	46	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	49	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	46	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	48	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Anthracene	62	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	67	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	72	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	68	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	56	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	60	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	59	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Chrysene	55	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	60	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	72	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Fluorene	56	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	58	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Naphthalene	48	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Perylene	56	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Phenanthrene	60	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM
Pyrene	72	1.7	1	ug/L		08/13/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O - 24HRMSD

Matrix Type : WATER
Collection Date : 08/03/05
Report Date : 08/23/05
Lab Sample Number : 862259-021

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte	Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	38	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	51	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	44	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	38	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	41	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Acenaphthene	38	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Acenaphthylene	38	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Anthracene	57	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	65	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	75	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	71	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	58	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	62	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	61	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Chrysene	57	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	65	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluoranthene	73	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Fluorene	46	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	62	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Naphthalene	42	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Perylene	58	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Phenanthrene	56	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM
Pyrene	72	1.7	1	ug/L		08/14/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 862259

Client : LAKE SUPERIOR RESEARCH INSTITUTE
Project Name : ASHLAND - PAH EQUILIBRIUM
Project Number :
Field ID : O DUP - 24HR

Matrix Type : WATER
Collection Date : 08/03/05
Report Date : 08/23/05
Lab Sample Number : 862259-022

SEMIVOLATILES - SPECIAL LIST - SIM

Prep Date: 08/09/05

Analyte		Result	EQL	Dilution	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
1-Methylphenanthrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,3,5-Trimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2,6-Dimethylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Anthracene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		2.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(e)pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Chrysene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.2	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluoranthene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Fluorene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		2.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Naphthalene		6.1	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Perylene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Phenanthrene		2.8	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM
Pyrene	<	1.7	1.7	1	ug/L	&	08/13/05	SW846 3510C	8270C-SIM

APPENDIX 4

Survival and Growth of *H. azteca* Following 28-d of Exposure to Ashland Harbor Sediments, 29 June 2005 to 27 July 2005

Appendix Table 4. Survival and Growth of *H. azteca* following 28-d of Exposure to Ashland Harbor Sediments, 29 June 2005 to 27 July 2005.

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Total Dry wt (mg)	Individual Dry Wt. (mg)	Average Dry Wt (mg)	Standard Deviation
A	Silica Sand	1	9			2.7	0.30		
A	Silica Sand	2	11			6.0	0.55		
A	Silica Sand	3	9			3.7	0.41		
A	Silica Sand	4	9			4.1	0.46		
A	Silica Sand	5	10			3.6	0.36		
A	Silica Sand	6	10			4.1	0.41		
A	Silica Sand	7	9			9.8	1.09		
A	Silica Sand	8	9	95.0	7.6	3.0	0.33	0.49	0.25
B	Form. Sediment	1	7			2.9	0.41		
B	Form. Sediment	2	9			3.9	0.43		
B	Form. Sediment	3	9			4.1	0.46		
B	Form. Sediment	4	8			4.5	0.56		
B	Form. Sediment	5	8			3.1	0.39		
B	Form. Sediment	6	8			4.2	0.53		
B	Form. Sediment	7	6			*			
B	Form. Sediment	8	9	80.0	10.7	*		0.46	0.07
C	W. Bearskin	1	10			2.8	0.28		
C	W. Bearskin	2	9			2.2	0.24		
C	W. Bearskin	3	10			2.1	0.21		
C	W. Bearskin	4	10			2.3	0.23		
C	W. Bearskin	5	10			2.2	0.22		
C	W. Bearskin	6	7			2.2	0.31		
C	W. Bearskin	7	10			1.5	0.15		
C	W. Bearskin	8	10	95.0	10.7	2.9	0.29	0.24	0.05
D	SQT9	1	7			3.2	0.46		
D	SQT9	2	5			2.7	0.54		
D	SQT9	3	8			2.6	0.33		
D	SQT9	4	10			3.3	0.33		
D	SQT9	5	7			2.6	0.37		
D	SQT9	6	8			2.5	0.31		
D	SQT9	7	9			3.7	0.41		
D	SQT9	8	10	80.0	16.9	3.2	0.32	0.38	0.08
E	SQT10	1	5			2.5	0.50		
E	SQT10	2	3			1.6	0.53		
E	SQT10	3	3			1.6	0.53		
E	SQT10	4	4			2.1	0.53		
E	SQT10	5	5			1.9	0.38		
E	SQT10	6	6			2.4	0.40		
E	SQT10	7	3			1.4	0.47		
E	SQT10	8	3	40.0	12.0	1.7	0.57	0.49	0.07
F	SQT11	1	10			2.2	0.22		
F	SQT11	2	7			1.9	0.27		
F	SQT11	3	9			1.7	0.19		
F	SQT11	4	9			1.9	0.21		
F	SQT11	5	10			1.4	0.14		
F	SQT11	6	8			2.8	0.35		
F	SQT11	7	9			2.1	0.23		
F	SQT11	8	10	90.0	10.7	2.2	0.22	0.23	0.06
G	SQT12	1	5			2.9	0.58		
G	SQT12	2	0			0.0	0.00		
G	SQT12	3	8			3.0	0.38		
G	SQT12	4	6			2.1	0.35		
G	SQT12	5	5			2.6	0.52		
G	SQT12	6	8			3.6	0.45		
G	SQT12	7	1			0.8	0.80		
G	SQT12	8	6	48.8	29.5	3.1	0.52	0.45	0.23

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Total Dry wt (mg)	Individual Dry Wt. (mg)	Average Dry Wt (mg)	Standard Deviation
H	SQT6	1	10			2.3	0.23		
H	SQT6	2	9			2.3	0.26		
H	SQT6	3	9			3.0	0.33		
H	SQT6	4	8			1.8	0.23		
H	SQT6	5	9			2.1	0.23		
H	SQT6	6	9			2.8	0.31		
H	SQT6	7	9			3.0	0.33		
H	SQT6	8	10	91.3	6.4	2.8	0.28	0.28	0.05
I	SQT2	1	9			2.5	0.28		
I	SQT2	2	9			2.0	0.22		
I	SQT2	3	8			2.8	0.35		
I	SQT2	4	10			3.6	0.36		
I	SQT2	5	10			3.1	0.31		
I	SQT2	6	6			2.2	0.37		
I	SQT2	7	11			2.5	0.23		
I	SQT2	8	10	91.3	15.5	3.8	0.38	0.31	0.06
J	SQT7	1	0			0.0	0.00		
J	SQT7	2	0			0.0	0.00		
J	SQT7	3	1			0.7	0.70		
J	SQT7	4	0			0.0	0.00		
J	SQT7	5	1			0.6	0.60		
J	SQT7	6	1			0.7	0.70		
J	SQT7	7	1			0.5	0.50		
J	SQT7	8	1	6.3	5.2	0.7	0.70	0.40	0.34
K	SQT4	1	9			2.6	0.29		
K	SQT4	2	10			2.2	0.22		
K	SQT4	3	9			2.0	0.22		
K	SQT4	4	10			2.4	0.24		
K	SQT4	5	10			2.7	0.27		
K	SQT4	6	9			2.9	0.32		
K	SQT4	7	9			2.1	0.23		
K	SQT4	8	10	95.0	5.3	2.5	0.25	0.26	0.04
L	SQT3	1	7			3.0	0.43		
L	SQT3	2	8			2.4	0.30		
L	SQT3	3	8			2.6	0.33		
L	SQT3	4	8			3.3	0.41		
L	SQT3	5	6			3.1	0.52		
L	SQT3	6	6			3.1	0.52		
L	SQT3	7	7			3.0	0.43		
L	SQT3	8	8	72.5	8.9	3.6	0.45	0.42	0.08
M	SQT5	1	9			3.5	0.39		
M	SQT5	2	10			3.4	0.34		
M	SQT5	3	9			3.1	0.34		
M	SQT5	4	9			3.2	0.36		
M	SQT5	5	8			2.8	0.35		
M	SQT5	6	8			2.7	0.34		
M	SQT5	7	10			2.8	0.28		
M	SQT5	8	10	91.3	8.3	2.7	0.27	0.33	0.04
N	SQT1	1	0			0.0	0.00		
N	SQT1	2	0			0.0	0.00		
N	SQT1	3	0			0.0	0.00		
N	SQT1	4	0			0.0	0.00		
N	SQT1	5	0			0.0	0.00		
N	SQT1	6	0			0.0	0.00		
N	SQT1	7	0			0.0	0.00		
N	SQT1	8	0	0.0	0.0	0.0	0.00	0.00	0.00

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Total Dry wt (mg)	Individual Dry Wt. (mg)	Average Dry Wt (mg)	Standard Deviation
O	SQT8	1	9			3.2	0.36		
O	SQT8	2	8			2.9	0.36		
O	SQT8	3	10			2.6	0.26		
O	SQT8	4	8			3.6	0.45		
O	SQT8	5	7			2.2	0.31		
O	SQT8	6	8			2.1	0.26		
O	SQT8	7	8			2.7	0.34		
O	SQT8	8	4	77.5	17.5	1.3	0.33	0.33	0.06

* Lab accident. Organisms lost in handling pan.

APPENDIX 5

Water Chemistry Parameters of *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.
Temperature (° C)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	1	23.7	23.9	23.9	23.6	23.5	23.3	23.4	23.7	23.7	23.6	23.4	23.7	23.6	23.6	23.5
29-Jun-05	0	7:50	2	23.7	23.8	24.0	23.5	23.7	23.5	23.4	23.9	23.8	23.6	23.4	23.7	23.8	23.8	23.5
29-Jun-05	0	7:50	3	23.7	23.9	23.9	23.8	23.5	23.5	23.3	23.9	23.7	23.5	23.8	23.5	23.7	23.8	23.5
29-Jun-05	0	7:50	4	23.8	23.9	23.9	23.9	23.6	23.4	23.4	23.9	23.8	23.8	23.3	23.7	23.8	23.8	23.4
29-Jun-05	0	7:50	5	23.6	24.0	23.9	23.8	23.7	23.4	23.5	23.5	23.7	23.8	23.5	23.7	23.6	23.7	23.5
29-Jun-05	0	7:50	6	23.7	24.0	23.8	23.8	23.7	23.1	23.3	23.9	23.6	23.7	23.1	23.6	23.8	23.8	23.6
29-Jun-05	0	7:50	7	23.7	23.9	23.8	23.2	23.6	23.3	23.4	23.9	23.6	23.7	23.4	23.6	23.7	23.8	23.4
29-Jun-05	0	7:50	8	23.7	23.9	23.9	23.7	23.6	23.4	23.5	23.8	23.6	23.8	23.2	23.8	23.7	23.8	23.5
29-Jun-05	0	4:20	1	23.9	23.7	23.6	23.6	23.6	23.4	23.4	23.6	23.5	23.6	23.3	23.6	23.7	23.5	23.5
29-Jun-05	0	4:20	4	23.8	23.7	23.8	23.8	23.6	23.4	23.5	23.6	23.6	23.6	23.4	23.7	23.5	23.4	23.4
30-Jun-05	1	7:00	4	23.6	23.4	23.7	23.5	23.3	23.3	23.4	23.3	23.5	23.4	23.2	23.3	23.1	23.3	23.4
30-Jun-05	1	7:00	6	23.5	23.4	23.7	23.5	23.4	23.3	23.3	23.4	23.2	23.4	23.2	23.4	23.0	23.3	23.4
30-Jun-05	1	15:45	4	24.0	23.8	23.7	23.8	23.8	23.7	23.8	23.8	23.6	23.6	23.7	23.8	23.8	23.9	23.5
30-Jun-05	1	15:45	8	23.8	23.8	23.8	23.8	23.8	23.7	23.7	23.9	23.4	23.7	23.7	23.8	23.8	23.9	23.2
1-Jul-05	2	8:00	4	23.1	23.7	23.7	23.7	23.1	23.5	23.0	23.7	23.6	23.5	22.8	23.5	23.5	23.7	23.3
1-Jul-05	2	8:00	5	23.1	23.9	23.8	23.8	23.2	23.6	23.0	23.7	23.4	23.5	22.9	23.5	23.5	23.8	23.3
1-Jul-05	2	15:15	2	23.2	23.9	23.9	23.7	23.1	23.0	23.0	23.6	23.4	23.6	23.0	23.6	23.6	23.9	23.5
1-Jul-05	2	15:15	4	23.2	23.9	23.8	23.9	23.1	23.0	23.1	23.6	23.5	23.5	23.0	23.5	23.6	23.8	23.6
2-Jul-05	3	8:15	4	23.2	23.8	23.7	23.4	22.8	22.8	22.9	23.4	23.0	23.4	22.8	23.6	23.5	23.6	23.2
2-Jul-05	3	8:15	7	23.2	23.9	23.7	23.8	22.9	22.9	22.9	23.6	23.1	23.5	22.9	23.6	23.6	23.6	23.1
2-Jul-05	3	16:30	3	23.4	22.9	23.9	22.7	23.3	23.2	23.1	23.0	23.4	23.9	23.1	23.8	22.9	22.8	23.6
2-Jul-05	3	16:30	4	23.4	22.9	24.0	22.9	23.4	23.2	23.2	22.9	23.8	23.8	23.1	23.9	22.9	22.9	23.8
3-Jul-05	4	8:10	1	23.5	22.5	24.0	22.1	23.3	23.2	23.3	22.1	23.7	23.1	23.2	23.8	22.7	22.7	23.6
3-Jul-05	4	8:10	4	23.4	22.5	23.9	22.6	23.3	23.2	23.3	22.5	23.7	23.8	23.2	23.9	22.8	22.8	23.7
3-Jul-05	4	16:00	3	24.2	25.1	24.3	24.9	23.0	24.0	23.8	24.8	24.2	24.3	24.0	24.2	24.8	24.8	24.1
3-Jul-05	4	16:00	4	24.1	25.0	24.4	25.0	24.1	24.0	23.9	24.8	24.2	24.3	23.5	24.2	24.8	24.8	24.2
4-Jul-05	5	8:00	4	22.9	21.7	23.7	21.7	22.8	22.8	22.7	21.7	23.1	23.7	22.7	23.6	22.2	21.8	23.4
4-Jul-05	5	8:00	6	22.9	21.8	23.7	21.8	22.8	22.8	22.7	21.6	23.6	23.7	22.7	23.7	22.1	21.9	23.7
4-Jul-05	5	16:15	4	23.5	24.6	23.9	24.6	23.4	23.2	23.2	24.6	23.7	23.8	23.2	23.8	24.6	24.4	23.7
4-Jul-05	5	16:15	8	23.4	24.4	23.9	24.6	23.4	23.3	23.2	24.6	23.8	23.8	23.2	23.9	24.6	24.5	23.7
5-Jul-06	6	6:30	4	23.0	22.8	23.2	21.7	22.8	22.6	22.2	21.5	23.4	23.4	22.5	23.3	21.6	21.4	23.3
5-Jul-06	6	6:30	5	22.6	21.7	23.3	21.6	22.7	22.7	22.7	21.6	23.3	23.4	22.3	23.2	21.6	21.4	23.4
5-Jul-06	6	14:30	2	23.0	23.4	23.6	23.2	22.8	22.7	22.7	23.5	23.4	23.4	22.7	23.4	23.5	23.0	23.3
5-Jul-06	6	14:30	4	22.9	23.4	23.5	23.3	22.8	22.8	22.8	23.4	23.5	23.4	22.7	23.3	23.6	23.1	23.4
6-Jul-05	7	7:20	4	22.6	23.0	22.7	22.9	22.3	22.6	22.7	23.3	23.1	22.9	22.1	23.1	23.2	23.0	23.1
6-Jul-05	7	7:20	7	22.5	22.7	22.5	23.1	22.4	22.4	22.9	23.1	23.1	22.9	22.3	23.0	23.3	23.1	23.1
6-Jul-05	7	15:30	3	23.1	23.6	23.3	23.7	23.1	23.0	23.2	23.7	23.1	23.3	22.8	23.2	23.5	23.5	23.3
6-Jul-05	7	15:30	4	23.1	23.6	23.3	23.7	23.2	23.0	23.1	23.6	23.3	23.4	23.0	23.2	23.6	23.6	23.3
7-Jul-05	8	6:30	4	23.0	23.3	23.4	23.1	22.6	22.7	22.8	23.2	22.4	23.3	22.8	23.2	23.0	22.9	23.0
7-Jul-05	8	6:30	6	23.0	23.2	22.4	23.1	22.8	22.7	22.7	22.4	23.2	22.9	23.2	23.4	23.1	23.0	23.2
7-Jul-05	8	15:15	4	23.0	23.0	23.5	23.1	22.6	22.9	22.8	23.0	23.6	23.2	22.7	23.3	23.1	22.9	23.3
7-Jul-05	8	15:15	8	22.9	23.0	23.4	23.5	22.7	22.7	22.6	23.1	23.3	23.4	22.7	23.3	23.1	22.8	23.4
8-Jul-08	9	6:45	4	23.0	23.2	23.5	23.0	22.7	22.7	22.9	22.9	23.3	23.4	22.7	23.1	23.0	23.0	23.3
8-Jul-08	9	6:45	7	22.8	23.1	23.3	23.2	22.9	22.5	22.6	22.7	23.3	23.5	22.9	23.2	22.9	23.2	23.0
8-Jul-08	9	15:15	1	22.9	23.1	23.6	23.1	23.0	22.9	22.9	23.2	23.2	23.4	22.8	23.4	23.2	22.9	23.4
8-Jul-08	9	15:15	4	23.1	23.1	23.6	23.1	23.1	23.0	22.8	23.2	23.4	23.5	22.8	23.4	23.2	22.8	23.3
9-Jul-05	10	8:00	4	23.1	22.9	23.0	23.2	22.7	22.6	23.0	22.8	23.3	23.3	22.9	23.3	23.2	23.2	23.2
9-Jul-05	10	8:00	5	23.2	22.9	23.1	23.2	22.7	22.5	23.0	22.8	23.3	23.2	22.9	23.0	23.2	23.2	23.3
9-Jul-05	10	17:30	2	23.4	23.3	23.6	23.4	23.2	23.3	23.3	23.4	23.4	23.7	23.4	23.6	23.4	23.4	23.6
9-Jul-05	10	17:30	4	23.4	23.3	23.6	23.3	23.3	23.3	23.4	23.4	23.6	23.6	23.4	23.6	23.4	23.4	23.6
10-Jul-05	11	8:00	4	23.3	23.5	23.6	23.6	23.2	23.1	23.2	23.3	23.3	23.3	23.1	23.4	23.3	23.4	23.3
10-Jul-05	11	8:00	7	23.3	23.5	23.6	23.5	22.9	23.2	23.1	23.3	23.3	23.3	23.1	23.4	23.3	23.4	23.3
10-Jul-05	11	18:20	3	23.7	23.8	23.8	23.7	23.7	23.6	23.6	23.9	23.9	23.9	23.7	23.8	23.9	23.9	23.7
10-Jul-05	11	18:20	4	23.7	23.8	23.8	23.8	23.8	23.7	23.7	23.9	24.0	23.9	23.7	23.9	23.9	23.9	23.8

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
11-Jul-05	12	6:00	1	23.3	23.2	23.5	23.3	23.2	23.2	23.2	23.4	23.4	23.6	23.1	23.4	23.5	23.4	23.3
11-Jul-05	12	6:00	4	23.3	23.3	23.5	23.4	23.3	23.3	23.4	23.5	23.4	23.8	23.3	23.6	23.4	23.4	23.4
11-Jul-05	12	15:15	4	23.8	23.7	24.0	23.6	23.8	23.6	23.5	23.8	24.0	24.1	23.5	24.0	24.0	23.8	24.1
11-Jul-05	12	15:15	5	23.7	23.7	24.1	23.7	23.7	23.5	23.5	23.8	24.0	24.2	23.5	24.0	24.0	23.9	24.2
12-Jul-05	13	8:00	4	23.1	23.2	23.5	23.4	23.1	23.4	23.4	23.4	23.6	23.6	23.0	23.7	23.5	23.3	23.7
12-Jul-05	13	8:00	6	23.1	23.1	23.4	23.6	23.0	23.4	23.3	23.2	23.6	23.6	23.0	23.5	23.4	22.9	23.7
12-Jul-05	13	15:00	4	23.4	23.8	24.5	23.9	23.8	23.7	23.6	23.9	24.5	24.5	23.7	24.4	23.9	23.9	24.6
12-Jul-05	13	15:00	8	23.8	23.8	24.5	23.9	23.8	23.7	23.6	23.9	24.5	24.5	23.7	24.5	23.9	23.9	24.6
13-Jul-05	14	8:30	4	24.4	24.6	24.9	24.6	24.4	24.2	24.1	24.6	24.8	24.9	24.2	24.8	24.7	24.5	25.0
13-Jul-05	14	8:30	5	24.4	24.7	24.9	24.7	24.4	24.2	24.1	24.7	24.8	24.9	24.2	24.7	24.7	24.5	25.0
13-Jul-05	14	14:50	2	23.4	23.6	24.0	23.6	23.7	23.4	23.4	23.7	24.1	24.0	23.5	24.0	23.8	23.7	24.1
13-Jul-05	14	14:50	4	23.5	23.6	23.4	23.6	23.7	23.4	23.4	23.7	24.1	24.0	23.4	24.0	23.8	23.6	24.1
14-Jul-05	15	8:00	4	23.5	23.5	23.6	23.5	23.5	23.3	23.3	23.5	23.6	23.6	23.3	23.6	23.6	23.5	23.7
14-Jul-05	15	8:00	7	23.5	23.6	23.7	23.5	23.5	23.3	23.3	23.5	23.7	23.7	23.3	23.6	23.6	23.4	23.7
14-Jul-05	15	15:00	3	23.0	23.5	23.7	23.3	23.0	22.9	22.8	23.6	23.8	23.8	22.9	23.6	23.7	23.4	23.8
14-Jul-05	15	15:00	4	23.0	23.5	23.7	23.5	23.0	22.8	22.8	23.6	23.7	23.8	22.9	23.7	23.7	23.5	23.8
15-Jul-05	16	6:30	1	22.5	22.8	23.3	22.6	22.3	22.0	22.0	22.7	23.2	23.2	22.0	22.5	22.8	22.4	23.1
15-Jul-05	16	6:30	4	22.5	22.8	23.3	22.7	22.4	22.0	22.0	22.8	23.2	23.2	22.0	23.0	22.7	22.4	23.0
15-Jul-05	16	16:00	4	22.9	23.0	23.5	22.9	22.8	22.7	22.5	22.9	23.5	23.5	22.8	23.2	22.9	22.9	23.5
15-Jul-05	16	16:00	8	22.8	23.1	23.0	22.9	22.8	22.8	22.5	23.0	23.6	23.4	22.7	23.3	22.8	22.9	23.5
16-Jul-05	17	5:30	4	22.9	23.1	23.1	23.0	22.9	22.9	22.7	22.7	23.1	23.3	22.7	23.2	22.9	22.8	23.3
16-Jul-05	17	5:30	6	23.0	22.9	23.0	23.1	22.8	22.7	22.7	22.8	23.1	23.1	22.8	23.3	22.8	22.7	23.4
16-Jul-05	17	14:45	4	22.9	23.3	23.5	23.1	22.8	22.8	22.9	22.8	23.5	23.6	23.4	23.4	23.3	23.2	23.6
16-Jul-05	17	14:45	8	22.8	23.2	23.4	23.0	22.7	22.9	22.8	22.9	23.4	23.4	23.3	23.3	23.4	23.3	23.5
17-Jul-05	18	9:45	4	22.8	23.1	23.4	23.1	22.9	22.7	22.6	23.1	23.5	23.5	22.8	23.3	23.1	23.0	23.5
17-Jul-05	18	9:45	5	22.8	23.1	23.4	23.1	22.8	22.8	22.6	23.1	23.5	23.5	22.8	23.3	23.1	23.0	23.5
17-Jul-05	18	15:00	2	23.3	23.5	23.5	23.5	23.3	23.4	23.3	23.3	23.5	23.6	23.2	23.4	23.6	23.4	23.4
17-Jul-05	18	15:00	4	23.1	23.4	23.5	23.5	23.2	23.3	23.4	23.4	23.4	23.6	23.1	23.5	23.5	23.5	23.5
18-Jul-05	19	7:00	4	23.1	22.4	23.2	22.4	22.9	23.0	22.8	22.4	23.2	23.2	23.1	23.1	22.5	22.3	23.2
18-Jul-05	19	7:00	7	23.3	22.4	23.3	22.4	22.8	23.0	22.7	22.5	23.2	23.3	23.1	23.0	22.4	22.3	23.3
18-Jul-05	19	16:00	3	23.2	23.1	23.1	23.1	23.2	23.4	23.3	23.0	23.2	23.3	23.4	23.0	23.0	23.1	23.1
18-Jul-05	19	16:00	4	23.3	23.1	23.1	23.2	23.2	23.3	23.4	23.0	23.3	23.3	23.4	23.2	23.0	23.2	23.1
19-Jul-05	20	7:30	1	21.3	21.6	21.9	21.6	21.3	21.4	21.3	21.6	22.0	21.9	21.5	21.7	21.7	21.7	21.9
19-Jul-05	20	7:30	4	21.3	21.6	21.8	21.7	21.3	21.4	21.3	21.7	22.0	21.9	21.5	21.8	21.7	21.7	21.9
19-Jul-05	20	15:20	2	22.1	22.2	22.2	22.4	22.0	22.1	22.0	22.3	22.3	22.3	22.1	22.1	22.3	22.4	22.3
19-Jul-05	20	15:20	4	22.1	22.2	22.2	22.4	22.0	22.1	22.0	22.3	22.3	22.3	22.2	22.2	22.3	22.4	22.3
20-Jul-05	21	6:30	4	23.3	23.4	23.4	23.6	23.4	23.5	23.3	23.4	23.4	23.4	23.3	23.2	23.5	23.5	23.3
20-Jul-05	21	6:30	6	23.3	23.5	23.4	23.6	23.2	23.4	23.3	23.4	23.4	23.5	23.4	23.3	23.5	23.5	23.3
20-Jul-05	21	16:00	4	23.7	23.8	23.7	23.8	23.4	23.4	23.3	23.6	23.8	23.5	23.5	23.4	23.6	23.7	23.7
20-Jul-05	21	16:00	8	23.6	23.8	23.7	23.8	23.5	23.4	23.3	23.7	23.7	23.7	23.5	23.4	23.6	23.7	23.7
21-Jul-05	22	8:00	4	22.6	22.9	22.9	23.0	22.3	22.3	22.8	22.7	22.9	22.9	22.4	22.9	22.6	22.5	23.1
21-Jul-05	22	8:00	5	22.5	22.9	23.0	22.9	22.4	22.3	22.3	22.8	23.1	23.1	21.9	23.1	22.7	22.9	23.1
21-Jul-05	22	15:30	2	22.9	22.6	23.3	22.7	22.9	22.0	22.8	22.7	23.2	23.3	22.9	23.0	22.7	22.7	23.1
21-Jul-05	22	15:30	4	22.9	22.5	23.3	22.7	22.9	23.0	22.8	22.6	23.0	23.3	22.9	23.1	22.7	22.7	23.2
22-Jul-05	23	7:30	4	23.4	23.7	23.6	23.7	23.4	23.5	23.4	23.7	23.6	23.6	23.5	23.5	23.8	23.7	23.4
22-Jul-05	23	7:30	7	23.4	23.7	23.5	23.8	23.4	23.5	23.4	23.8	23.5	23.7	23.6	23.5	23.8	23.7	23.5
22-Jul-05	23	14:30	3	23.4	23.4	23.6	23.3	23.3	23.4	23.4	23.6	23.6	23.6	23.4	23.4	23.7	23.4	23.5
22-Jul-05	23	14:30	4	23.4	23.4	23.6	23.5	23.3	23.5	23.4	23.6	23.6	23.6	23.5	23.4	23.7	23.5	23.6
23-Jul-05	24	8:00	1	23.1	23.2	23.3	23.3	23.4	23.2	23.1	23.0	23.4	23.4	23.2	23.3	23.1	23.2	23.0
23-Jul-05	24	8:00	4	23.2	23.3	23.4	23.1	23.2	23.2	23.1	23.2	23.3	23.4	23.1	23.2	23.1	23.2	23.3
23-Jul-05	24	15:15	4	23.4	23.4	23.6	23.5	23.4	23.5	23.3	23.6	23.6	23.7	23.4	23.5	23.6	23.5	23.7
23-Jul-05	24	15:15	6	23.5	23.5	23.6	23.6	23.4	23.5	23.3	23.6	23.6	23.7	23.4	23.5	23.6	23.5	23.7
24-Jul-05	25	8:15	4	23.2	23.1	23.3	23.4	23.2	23.3	23.2	23.3	23.3	23.3	23.3	23.2	23.3	23.1	23.3
24-Jul-05	25	8:15	6	23.3	23.2	23.3	23.5	23.3	23.3	23.2	23.3	23.2	23.3	23.3	23.2	23.3	23.4	23.3
24-Jul-05	25	15:20	4	23.5	23.5	23.6	23.7	23.4	23.4	23.4	23.6	23.7	23.7	23.4	23.5	23.6	23.4	23.7
24-Jul-05	25	15:20	8	23.5	23.5	23.6	23.7	23.5	23.4	23.4	23.7	23.7	23.7	23.4	23.6	23.6	23.5	23.7

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
25-Jul-05	26	8:00	4	23.4	23.4	23.6	23.5	23.4	23.4	23.3	23.5	23.4	23.6	23.3	23.4	23.4	23.3	23.5
25-Jul-05	26	8:00	5	23.5	23.4	23.6	23.5	23.4	23.4	23.3	23.5	23.4	23.6	23.3	23.4	23.4	23.3	23.5
25-Jul-05	26	16:00	2	23.5	23.6	23.6	23.6	23.4	23.6	23.5	23.7	23.6	23.6	23.5	23.5	23.5	23.6	23.7
25-Jul-05	26	16:00	4	23.6	23.5	23.7	23.7	23.4	23.6	23.5	23.6	23.5	23.6	23.5	23.5	23.5	23.6	23.7
26-Jul-05	27	8:30	4	23.6	22.8	23.7	23.7	23.5	23.5	23.3	23.6	23.6	23.6	23.4	23.6	23.5	23.5	23.6
26-Jul-05	27	8:30	7	23.7	23.7	23.7	23.6	23.4	23.4	23.3	23.6	23.5	23.6	23.4	23.3	23.5	23.6	23.4
26-Jul-05	27	15:45	3	23.7	23.9	23.7	23.7	23.6	23.9	23.7	23.7	23.5	23.8	23.8	23.5	23.4	23.6	23.4
26-Jul-05	27	15:45	4	23.9	23.8	23.8	23.8	23.7	23.9	23.7	23.7	23.7	23.8	23.8	23.5	23.4	23.7	23.5
27-Jul-05	28	6:00	1	22.8	22.9	23.0	23.1	23.0	23.1	22.9	22.9	23.0	23.0	22.9	22.8	22.8	22.9	22.9
27-Jul-05	28	6:00	2	22.9	23.0	23.1	23.0	23.1	23.0	22.9	22.9	23.0	23.1	23.0	22.9	22.8	22.9	22.9
27-Jul-05	28	6:00	3	23.0	23.0	23.1	23.0	23.1	23.1	22.9	23.0	22.9	23.0	23.0	22.8	22.8	22.9	22.9
27-Jul-05	28	6:00	4	23.0	23.0	23.1	23.1	23.1	23.1	22.9	23.0	23.0	23.1	23.0	22.8	22.9	23.0	22.9
27-Jul-05	28	6:00	5	23.0	23.0	23.0	23.0	23.0	23.0	22.9	23.0	22.9	23.1	23.0	22.7	22.8	23.0	22.9
27-Jul-05	28	6:00	6	22.9	23.0	23.0	23.0	23.0	23.1	22.9	23.0	23.0	23.0	23.0	22.8	22.9	23.0	22.9
27-Jul-05	28	6:00	7	23.0	23.0	22.9	23.0	22.9	23.0	22.9	23.0	22.9	23.1	23.0	22.8	22.8	23.0	22.9
27-Jul-05	28	6:00	8	23.0	23.0	22.8	23.0	23.0	23.0	22.9	22.9	22.8	23.1	23.0	22.8	22.9	22.9	22.7
			Average	**23.2**	**23.3**	**23.5**	**23.3**	**23.2**	**23.1**	**23.1**	**23.3**	**23.4**	**23.5**	**23.1**	**23.4**	**23.3**	**23.3**	**23.4**
			Minimum	21.3	21.6	21.8	21.6	21.3	21.4	21.3	21.5	22.0	21.9	21.5	21.7	21.6	21.4	21.9
			Maximum	24.4	25.1	24.9	25.0	24.4	24.2	24.1	24.8	24.8	24.9	24.2	24.8	24.8	24.8	25.0

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	1	6.9	6.6	6.8	6.6	2.6	6.6	5.5	7.0	5.8	7.6	6.3	7.5	7.1	7.4	4.3
29-Jun-05	0	7:50	2	6.9	6.8	6.8	6.7	6.6	7.3	6.6	7.2	6.9	6.7	7.3	7.5	7.3	5.9	4.5
29-Jun-05	0	7:50	3	6.7	6.8	5.8	7.0	2.8	7.0	5.2	7.1	7.0	6.2	6.4	7.8	7.4	5.6	3.3
29-Jun-05	0	7:50	4	6.8	6.8	6.5	7.3	3.9	7.2	7.0	7.2	7.2	5.7	7.2	7.9	7.3	6.9	3.9
29-Jun-05	0	7:50	5	7.0	6.8	6.3	6.8	6.1	6.6	6.9	7.1	7.1	7.3	7.5	7.8	7.5	7.6	5.2
29-Jun-05	0	7:50	6	6.7	6.9	6.0	5.5	6.3	6.6	6.6	6.6	6.8	7.3	5.6	7.9	5.9	7.6	6.6
29-Jun-05	0	7:50	7	7.0	6.8	6.8	5.6	6.3	6.9	6.4	6.7	7.0	7.3	7.0	8.0	7.4	7.2	3.6
29-Jun-05	0	7:50	8	6.9	6.9	6.6	6.3	5.9	6.1	7.0	6.3	7.0	7.3	6.8	8.1	7.7	7.5	4.0
29-Jun-05	0	4:20	1	6.9	7.0	6.9	5.7	4.6	5.8	7.9	7.2	5.4	7.1	4.6	5.8	6.2	6.8	5.2
29-Jun-05	0	4:20	4	7.4	7.0	6.9	6.0	4.6	7.8	8.0	8.1	4.1	6.2	8.0	5.8	8.0	5.2	4.2
30-Jun-05	1	7:00	4	6.8	6.9	7.3	6.8	6.7	6.9	7.7	7.8	5.1	7.8	7.5	5.4	7.7	5.2	4.3
30-Jun-05	1	7:00	6	6.7	7.1	7.4	7.4	6.8	5.7	7.1	7.6	5.4	7.6	6.0	6.0	6.6	6.7	7.4
30-Jun-05	1	15:45	4	6.9	6.0	6.6	5.0	5.5	6.4	7.2	6.6	7.2	6.5	7.4	6.3	6.8	6.7	6.2
30-Jun-05	1	15:45	8	7.1	6.6	6.6	6.9	6.6	6.8	7.1	6.4	3.9	6.8	6.0	6.8	6.4	7.0	4.6
1-Jul-05	2	8:00	4	7.5	7.3	7.3	5.1	5.3	6.8	6.9	7.6	7.4	7.4	7.5	7.7	7.4	7.2	6.2
1-Jul-05	2	0:00	5	7.3	7.2	7.2	6.2	6.3	6.6	6.9	7.6	7.3	7.1	7.5	6.7	7.4	6.1	7.3
1-Jul-05	2	15:15	2	6.1	6.5	5.2	4.8	4.7	6.6	7.0	7.4	7.1	7.4	6.6	6.7	6.0	4.7	4.1
1-Jul-05	2	15:15	4	7.0	5.9	6.0	7.2	5.2	6.7	7.3	7.0	6.3	7.0	7.1	5.9	6.5	6.1	4.2
2-Jul-05	3	8:15	4	6.9	6.0	6.0	6.8	7.1	7.2	7.3	7.0	6.8	6.7	7.2	6.6	7.3	5.7	7.3
2-Jul-05	3	8:15	7	6.8	6.7	7.2	5.7	4.1	7.2	7.2	7.3	7.2	7.3	6.5	7.0	7.5	6.6	5.3
2-Jul-05	3	16:30	3	7.0	6.9	6.9	6.6	5.6	7.1	6.4	6.1	4.8	5.5	7.3	5.8	7.1	7.1	6.7
2-Jul-05	3	16:30	4	7.0	7.1	6.6	6.8	6.0	7.2	7.3	7.2	7.3	6.5	7.3	6.6	6.8	6.5	5.2
3-Jul-05	4	8:10	1	6.9	5.6	6.9	6.1	2.5	6.6	6.9	6.6	6.4	6.3	6.3	6.5	6.2	6.2	6.2
3-Jul-05	4	8:10	4	6.9	6.1	6.5	5.4	6.5	6.6	7.0	6.8	7.1	5.4	6.9	5.9	6.4	6.8	6.1
3-Jul-05	4	16:00	3	6.5	5.5	5.1	5.2	4.2	6.3	5.9	6.8	5.0	5.7	6.7	4.8	6.6	6.6	6.7
3-Jul-05	4	16:00	4	6.4	6.6	4.9	4.7	6.6	6.5	6.9	7.0	6.2	6.3	6.4	5.0	6.2	6.7	5.7
4-Jul-05	5	8:00	4	6.8	6.9	6.8	6.8	6.5	7.2	7.3	7.3	7.3	7.3	7.2	7.0	7.3	7.2	6.1
4-Jul-05	5	8:00	6	6.7	6.7	7.1	7.3	6.4	6.8	6.7	7.3	6.6	7.3	6.9	4.9	5.2	7.4	7.3
4-Jul-05	5	16:15	4	6.9	7.0	6.0	7.1	7.4	6.2	7.6	7.5	6.2	7.0	7.2	6.5	7.2	7.2	5.4
4-Jul-05	5	16:15	8	7.3	6.9	6.1	7.3	6.9	6.9	7.4	6.4	7.2	6.9	7.1	6.6	7.0	6.6	3.4
5-Jul-06	6	6:30	4	7.7	7.1	7.2	6.9	7.2	7.3	7.4	7.2	7.3	6.6	6.9	6.1	7.3	7.5	5.8
5-Jul-06	6	6:30	5	7.7	6.5	6.6	7.2	7.1	6.6	7.6	7.2	5.9	6.5	7.2	3.0	4.7	6.9	6.9
5-Jul-06	6	14:30	2	6.6	5.9	5.6	7.3	7.0	7.5	7.6	7.7	7.3	6.5	7.7	6.9	6.2	6.1	5.7
5-Jul-06	6	14:30	4	7.7	6.6	6.7	7.5	7.2	6.5	7.5	7.7	7.6	7.0	7.5	7.0	6.5	6.6	5.9
6-Jul-05	7	7:20	4	7.8	6.7	7.1	7.2	6.3	7.4	6.9	7.4	7.9	6.9	7.0	6.0	6.1	7.2	6.2
6-Jul-05	7	7:20	7	6.9	6.5	6.5	6.6	7.6	7.1	7.1	7.6	6.9	7.5	6.7	6.8	7.1	6.4	7.0
6-Jul-05	7	15:30	3	6.9	7.3	6.0	7.5	6.4	7.7	5.6	7.6	6.1	7.7	6.7	6.9	7.7	7.3	6.9
6-Jul-05	7	15:30	4	7.1	6.9	5.4	7.4	6.8	7.6	7.7	7.7	7.6	7.9	6.9	7.2	7.2	7.3	7.0
7-Jul-05	8	6:30	4	7.3	6.4	6.6	7.1	6.3	6.5	7.5	7.3	6.7	7.2	7.3	7.0	7.1	6.0	7.0
7-Jul-05	8	6:30	6	7.5	6.3	6.5	6.4	5.9	7.5	7.0	7.0	6.4	6.9	7.1	7.2	6.4	6.0	7.1
7-Jul-05	8	15:15	4	7.1	6.7	6.5	4.9	6.8	7.3	6.8	4.7	2.3	6.6	7.3	7.6	6.5	7.5	6.7
7-Jul-05	8	15:15	8	7.4	6.6	7.2	7.3	6.5	7.8	7.4	7.4	6.3	7.3	7.4	6.6	7.6	7.4	7.7
8-Jul-08	9	6:45	4	6.4	6.6	6.9	7.0	6.4	7.2	6.7	7.1	7.4	7.2	7.6	6.9	7.1	6.4	6.6
8-Jul-08	9	6:45	7	6.7	6.5	7.2	6.6	6.7	6.9	7.1	6.8	7.4	7.0	7.4	6.7	6.9	7.2	6.9
8-Jul-08	9	15:15	1	6.6	6.9	6.6	5.7	6.8	7.2	7.2	6.9	4.5	5.3	6.3	5.0	6.3	6.4	7.1
8-Jul-08	9	15:15	4	7.6	7.0	6.2	6.3	6.9	7.1	7.0	7.2	7.3	5.0	6.8	6.5	6.7	6.7	6.9
9-Jul-05	10	8:00	4	6.2	5.9	6.9	6.0	4.9	6.3	6.8	6.9	6.3	6.4	5.6	6.6	6.8	5.8	6.1
9-Jul-05	10	8:00	5	6.1	5.8	5.9	6.3	5.0	6.2	6.8	6.2	5.6	5.4	5.9	5.4	5.8	5.3	6.4
9-Jul-05	10	17:30	2	6.6	6.5	6.2	3.5	6.5	6.6	6.7	5.9	6.6	6.2	6.1	6.4	6.1	5.9	6.3
9-Jul-05	10	17:30	4	6.6	5.9	6.6	3.6	6.5	6.3	6.8	6.4	6.6	5.6	6.6	6.5	4.9	5.8	5.7
10-Jul-05	11	8:00	4	6.4	5.8	6.4	5.9	5.0	6.3	6.2	6.2	6.3	5.2	6.4	5.8	5.3	5.3	6.2
10-Jul-05	11	8:00	7	5.9	4.4	6.0	6.2	4.4	5.9	5.0	6.2	6.2	5.9	6.1	5.5	5.9	6.1	6.6
10-Jul-05	11	18:20	3	6.7	6.0	5.0	6.7	4.9	6.2	6.6	6.5	4.2	4.8	5.4	5.9	5.8	5.0	5.0
10-Jul-05	11	18:20	4	6.5	6.5	6.4	6.6	6.5	6.3	6.6	6.6	6.4	5.1	5.4	6.3	4.9	5.4	5.6

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
11-Jul-05	12	6:00	1	6.4	4.4	5.5	6.1	6.1	5.0	6.4	6.0	4.7	5.4	5.9	4.1	5.3	4.7	5.9
11-Jul-05	12	6:00	4	6.7	5.9	6.6	6.6	6.4	6.1	6.9	6.4	6.7	5.2	6.1	5.9	5.0	5.1	6.1
11-Jul-05	12	15:15	4	6.4	5.8	6.3	6.5	4.4	5.4	6.7	6.6	5.6	5.0	6.6	4.4	5.3	5.1	5.5
11-Jul-05	12	15:15	5	6.0	5.4	6.3	6.6	4.8	6.6	5.6	6.3	5.4	4.8	5.5	3.3	4.2	4.6	5.5
12-Jul-05	13	8:00	4	6.3	6.4	6.3	6.1	5.1	5.6	6.4	6.4	6.9	6.0	6.9	5.8	6.4	6.7	4.7
12-Jul-05	13	8:00	6	5.9	6.0	6.0	6.4	5.3	5.9	5.7	6.8	6.3	6.3	6.5	6.5	6.4	5.3	6.4
12-Jul-05	13	15:00	4	6.4	5.6	4.9	4.8	6.1	6.2	6.2	5.9	6.0	5.1	6.3	5.3	6.3	6.2	4.3
12-Jul-05	13	15:00	8	6.3	5.5	6.2	6.0	6.1	6.1	5.6	5.6	4.5	5.7	6.2	6.0	5.9	3.9	5.9
13-Jul-05	14	8:30	4	6.6	5.8	6.5	5.7	5.5	6.4	6.4	6.0	6.2	6.3	6.3	6.1	6.4	6.4	4.9
13-Jul-05	14	8:30	5	6.3	5.9	6.1	6.3	5.2	6.0	6.4	6.1	5.2	6.1	6.0	4.8	5.2	5.7	5.2
13-Jul-05	14	14:50	2	6.7	6.2	6.3	5.8	6.0	6.4	6.3	6.3	6.1	6.4	6.5	6.0	6.1	6.2	5.5
13-Jul-05	14	14:50	4	6.6	6.6	6.4	5.5	5.9	6.2	6.4	6.1	6.3	6.1	5.9	5.1	6.3	6.3	5.9
14-Jul-05	15	8:00	4	6.4	6.1	6.2	5.9	4.8	6.1	5.0	6.4	6.3	6.1	6.4	6.0	6.2	6.3	5.2
14-Jul-05	15	8:00	7	6.2	4.2	6.2	5.9	6.2	6.4	6.5	6.5	6.1	6.3	6.5	6.1	6.0	5.6	6.0
14-Jul-05	15	15:00	3	6.7	5.1	6.2	4.6	5.0	6.3	6.4	6.3	3.9	5.3	6.0	4.6	6.2	5.9	6.1
14-Jul-05	15	15:00	4	6.6	5.2	6.0	4.2	6.1	6.3	6.3	6.1	6.2	5.9	6.1	5.0	6.1	6.2	5.0
15-Jul-05	16	6:30	1	6.2	3.3	5.1	3.0	3.7	5.8	6.6	6.7	5.2	6.5	6.6	6.0	6.2	6.5	6.8
15-Jul-05	16	6:30	4	6.8	6.1	5.8	4.4	5.1	6.6	6.4	6.8	6.5	6.4	5.8	6.0	6.4	6.8	6.6
15-Jul-05	16	16:00	4	6.6	6.1	6.3	6.7	5.5	6.3	6.8	7.0	6.5	6.7	6.4	6.2	7.0	6.6	6.4
15-Jul-05	16	16:00	8	6.7	6.4	4.9	6.6	6.4	6.4	6.0	7.1	4.2	6.8	6.5	6.0	6.7	6.2	6.6
16-Jul-05	17	5:30	4	6.4	4.2	5.8	4.8	5.3	5.2	6.1	6.4	6.3	6.1	6.2	5.4	6.4	6.6	6.2
16-Jul-05	17	5:30	6	6.0	5.7	6.2	4.1	5.6	6.2	6.3	5.9	6.4	6.9	6.6	6.1	6.7	5.4	6.7
16-Jul-05	17	14:45	4	6.1	5.0	6.1	6.3	4.2	6.3	6.4	6.6	6.6	5.6	5.4	5.4	4.1	5.4	5.6
16-Jul-05	17	14:45	8	6.4	6.1	5.7	5.4	5.7	6.4	5.8	7.3	5.1	6.2	5.9	5.9	6.3	5.7	5.9
17-Jul-05	18	9:45	4	6.4	3.4	6.4	6.3	6.0	6.1	6.5	6.7	6.3	6.0	6.1	4.3	6.5	6.1	6.1
17-Jul-05	18	9:45	5	6.4	2.4	6.1	6.4	5.6	6.1	6.6	6.5	4.4	6.2	5.8	5.9	6.1	5.6	6.5
17-Jul-05	18	15:00	2	6.6	3.9	6.2	5.9	3.7	5.0	6.0	6.6	6.0	5.9	6.2	5.7	5.3	5.9	5.4
17-Jul-05	18	15:00	4	6.1	5.8	6.1	6.1	5.3	5.4	6.4	6.4	6.4	6.0	6.0	4.9	6.4	6.3	6.1
18-Jul-05	19	7:00	4	6.1	6.3	6.3	5.9	5.4	5.7	6.1	6.2	6.3	5.9	5.3	5.1	6.1	6.1	5.7
18-Jul-05	19	7:00	7	6.3	5.2	5.9	6.3	5.7	5.7	5.7	5.9	5.7	6.1	5.9	5.5	5.6	6.2	6.3
18-Jul-05	19	16:00	3	6.2	5.8	6.2	5.8	4.6	6.0	6.0	6.1	5.4	5.0	5.5	4.4	6.0	4.4	5.7
18-Jul-05	19	16:00	4	6.1	5.2	6.2	6.0	4.9	5.9	5.8	6.0	6.3	5.9	5.6	5.6	5.3	5.6	5.5
19-Jul-05	20	7:30	1	6.4	5.1	6.5	6.4	5.6	6.0	6.1	6.4	5.1	6.5	6.2	5.3	5.8	6.1	6.6
19-Jul-05	20	7:30	4	6.3	6.0	6.4	6.0	5.5	6.0	6.2	6.3	6.4	6.3	6.6	5.7	6.3	6.0	6.1
19-Jul-05	20	15:20	2	6.9	5.4	6.2	6.0	3.9	5.2	5.8	6.2	6.0	5.9	6.1	6.2	5.5	5.7	4.5
19-Jul-05	20	15:20	4	6.3	6.0	6.2	6.1	4.1	5.2	6.2	6.2	4.8	5.1	5.4	5.8	5.8	6.0	4.5
20-Jul-05	21	6:30	4	6.7	5.0	6.3	6.1	4.1	5.9	6.1	6.1	6.1	5.9	5.7	5.7	5.9	5.3	4.0
20-Jul-05	21	6:30	6	6.3	5.9	6.2	6.1	5.7	5.9	4.7	6.1	5.1	6.0	5.8	5.3	5.4	5.2	5.7
20-Jul-05	21	16:00	4	6.6	5.0	6.9	7.1	6.0	6.3	7.0	7.2	5.1	5.9	6.9	6.5	6.3	6.2	5.2
20-Jul-05	21	16:00	8	7.2	7.0	6.8	6.9	7.3	6.8	7.2	7.0	6.5	7.2	7.3	6.7	6.7	4.3	7.0
21-Jul-05	22	8:00	4	7.7	4.5	7.0	5.4	7.3	7.2	7.2	8.0	7.4	7.5	6.8	7.7	7.9	7.6	7.3
21-Jul-05	22	8:00	5	7.5	5.6	6.9	6.8	7.7	7.2	6.9	7.9	6.0	6.8	8.0	7.6	7.6	7.0	7.7
21-Jul-05	22	15:30	2	8.1	4.5	7.3	7.4	6.0	4.8	7.1	7.1	7.2	6.6	6.5	7.5	5.6	6.1	5.5
21-Jul-05	22	15:30	4	7.7	5.2	7.5	7.4	6.6	6.3	7.1	7.1	5.0	5.6	6.7	7.2	7.0	5.9	6.1
22-Jul-05	23	7:30	4	7.7	1.9	6.6	7.0	7.1	7.0	6.7	7.5	6.9	7.2	7.1	7.0	7.2	6.0	5.4
22-Jul-05	23	7:30	7	7.4	2.5	7.2	6.9	5.7	7.1	6.5	7.4	6.9	7.0	6.7	7.1	7.2	4.8	7.2
22-Jul-05	23	14:30	3	8.0	4.5	7.0	6.7	5.9	6.8	7.0	7.5	4.7	7.5	7.3	4.8	7.0	4.1	7.4
22-Jul-05	23	14:30	4	7.8	5.2	6.0	7.3	7.3	7.2	7.4	7.3	5.8	7.0	6.8	7.2	7.4	6.1	5.6
23-Jul-05	24	8:00	1	7.8	1.9	7.5	6.9	6.6	5.9	6.0	7.7	7.4	7.5	7.5	5.3	6.1	7.3	7.0
23-Jul-05	24	8:00	4	8.0	6.5	7.4	7.4	6.2	7.4	7.7	7.3	7.8	7.9	6.8	7.3	7.1	7.0	6.3
23-Jul-05	24	15:15	4	7.8	6.9	7.4	7.7	6.4	6.7	7.5	7.6	7.5	7.2	7.0	7.4	7.4	6.5	6.1
23-Jul-05	24	15:15	6	7.8	4.6	7.4	7.6	6.1	7.1	6.9	7.7	5.6	7.3	7.5	7.0	7.4	7.2	7.4
24-Jul-05	25	8:15	4	7.8	7.8	7.9	7.1	6.2	7.0	7.2	7.6	7.4	6.3	7.1	7.4	7.0	7.5	6.6
24-Jul-05	25	8:15	6	7.9	6.8	7.5	7.5	6.3	7.0	6.8	7.8	6.4	7.6	7.6	7.0	7.5	7.1	7.6
24-Jul-05	25	15:20	4	8.2	5.2	7.4	5.7	6.4	7.1	7.3	7.6	7.3	6.9	7.2	7.1	7.2	7.2	5.5
24-Jul-05	25	15:20	8	8.0	7.2	7.1	7.2	6.8	7.2	7.0	7.3	4.6	6.8	7.3	6.3	7.2	4.6	7.3

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
25-Jul-05	26	8:00	4	8.0	5.5	7.3	7.1	7.0	6.6	7.3	7.4	7.3	7.1	7.3	3.7	7.4	7.2	6.1
25-Jul-05	26	8:00	5	7.7	5.8	7.4	7.1	7.2	6.3	7.2	7.4	6.1	6.8	7.2	6.6	7.0	6.4	7.4
25-Jul-05	26	16:00	2	8.3	6.2	7.5	6.2	5.1	4.3	6.7	7.3	6.8	6.3	5.5	6.9	6.3	7.1	6.3
25-Jul-05	26	16:00	4	8.5	4.5	7.2	5.7	4.5	6.0	7.1	7.2	7.0	7.1	4.9	6.8	7.0	6.9	6.0
26-Jul-05	27	8:30	4	8.2	3.8	7.5	6.7	6.1	7.0	7.7	8.0	7.9	7.8	7.2	6.6	8.0	8.0	7.2
26-Jul-05	27	8:30	7	7.2	5.3	7.7	7.1	5.1	7.7	7.7	7.9	7.4	7.8	7.7	8.1	8.2	7.4	7.5
26-Jul-05	27	15:45	3	7.5	4.9	7.6	7.3	3.9	7.0	7.2	7.6	5.9	7.3	7.5	6.6	7.2	7.3	5.8
26-Jul-05	27	15:45	4	9.2	5.0	7.3	7.3	4.9	5.9	6.9	7.3	7.2	7.7	6.7	6.8	7.2	7.3	6.0
27-Jul-05	28	6:00	1	7.6	3.5	7.5	7.1	6.3	5.3	7.2	7.7	6.2	6.7	6.6	6.5	7.2	7.7	7.5
27-Jul-05	28	6:00	2	6.1	7.0	7.5	6.9	6.7	5.6	6.7	7.6	7.0	7.1	6.8	6.8	6.9	7.8	7.2
27-Jul-05	28	6:00	3	7.4	6.1	7.5	7.1	6.1	7.2	7.4	7.5	6.4	7.3	7.0	6.8	7.2	7.0	6.9
27-Jul-05	28	6:00	4	7.1	6.9	7.4	7.3	6.9	7.1	7.5	7.6	7.3	7.5	6.7	7.2	7.4	7.2	7.2
27-Jul-05	28	6:00	5	7.3	5.7	7.3	6.9	7.3	6.2	7.5	7.4	6.3	7.5	7.0	7.5	7.5	6.5	6.1
27-Jul-05	28	6:00	6	7.3	6.8	7.4	7.0	6.7	6.5	7.2	7.6	6.6	7.7	7.2	7.3	7.4	7.2	7.3
27-Jul-05	28	6:00	7	7.4	4.0	7.3	6.9	6.0	6.7	7.4	7.9	7.1	7.6	6.8	7.5	7.7	6.3	7.4
27-Jul-05	28	6:00	8	7.3	6.6	7.5	7.0	7.0	5.9	7.5	7.9	6.0	7.6	6.9	7.5	7.5	6.0	7.5
			Average	**7.0**	**5.9**	**6.6**	**6.3**	**5.8**	**6.5**	**6.7**	**6.9**	**6.3**	**6.6**	**6.6**	**6.3**	**6.6**	**6.3**	**6.0**
			Minimum	5.9	1.9	4.9	3.0	2.5	4.3	4.7	4.7	2.3	4.8	4.6	3.0	4.1	3.9	3.3
			Maximum	9.2	7.8	7.9	7.7	7.7	7.8	8.0	8.1	7.9	7.9	8.0	8.1	8.2	8.0	7.7

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.

pH

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	1	8.00	7.57	7.79	7.50	6.96	7.57	7.58	7.85	7.70	7.97	7.08	7.67	7.43	7.70	7.00
29-Jun-05	0	7:50	4	8.10	7.75	7.95	7.90	6.79	7.73	7.93	7.97	7.88	7.48	7.53	7.97	7.95	7.62	6.88
29-Jun-05	0	7:50	5	8.10	7.98	7.70	7.93	7.43	7.63	7.77	7.93	7.76	7.90	7.89	8.00	7.55	7.88	7.19
29-Jun-05	0	7:50	8	8.10	7.90	7.83	7.25	7.53	7.40	7.96	8.01	7.68	7.93	7.24	8.02	7.89	7.93	6.94
2-Jul-05	3	8:15	4	7.71	7.50	7.54	7.34	7.85	7.66	7.93	7.78	7.60	7.56	7.84	7.64	7.77	7.45	7.50
2-Jul-05	3	8:15	7	7.68	7.82	7.73	7.84	7.21	7.73	7.92	7.80	7.71	7.85	7.72	7.90	7.88	7.65	7.83
5-Jul-06	6	6:30	4	7.92	7.88	7.84	7.77	7.68	7.77	7.98	7.84	7.95	8.01	7.93	7.58	7.91	7.84	7.60
5-Jul-06	6	6:30	5	7.85	7.68	7.70	7.68	7.89	7.80	7.90	7.89	7.49	7.91	7.91	7.17	7.41	7.90	7.71
7-Jul-05	8	6:30	4	8.45	7.77	7.77	7.61	7.68	7.80	7.90	7.78	7.83	7.83	7.87	7.58	7.89	7.87	7.69
7-Jul-05	8	6:30	6	8.01	7.84	7.83	7.73	7.85	7.81	7.80	7.82	7.52	7.82	7.68	7.75	7.60	7.92	7.95
9-Jul-05	10	8:00	4	7.97	8.01	7.78	7.63	7.59	7.89	8.04	7.94	7.98	7.92	7.60	7.85	7.80	7.70	7.86
9-Jul-05	10	8:00	5	8.06	7.90	7.92	7.87	7.35	7.76	8.01	8.01	7.61	7.66	7.68	7.45	7.67	7.65	7.94
12-Jul-05	13	8:00	4	8.21	7.84	7.96	7.97	7.84	7.86	7.96	7.96	7.98	8.06	7.98	7.85	8.03	7.96	7.51
12-Jul-05	13	8:00	6	8.13	7.92	7.86	7.94	7.85	7.81	8.05	7.96	7.99	8.01	8.01	7.98	7.85	7.73	7.58
14-Jul-05	15	8:00	4	8.06	7.92	7.88	7.74	7.59	7.70	7.66	8.06	7.98	8.09	8.00	8.08	8.10	8.08	7.67
14-Jul-05	15	8:00	7	8.07	6.81	7.99	7.80	7.97	7.84	8.02	8.07	7.72	8.08	7.68	8.11	8.01	7.81	8.04
16-Jul-05	17	5:30	4	8.00	8.06	7.62	7.62	7.51	7.56	7.60	7.97	7.92	7.92	8.06	8.00	8.12	8.06	7.51
16-Jul-05	17	5:30	6	8.10	7.81	7.59	7.67	7.82	7.81	7.57	7.99	7.72	7.97	8.04	7.99	8.06	7.93	7.62
19-Jul-05	20	7:30	1	8.09	7.58	8.00	7.84	7.84	7.74	8.07	8.09	7.59	7.92	8.10	7.76	7.95	7.98	8.03
19-Jul-05	20	7:30	4	8.10	7.57	8.09	7.82	7.75	7.70	8.07	8.11	7.98	8.14	8.06	7.82	8.10	7.99	7.95
21-Jul-05	22	8:00	4	8.09	6.80	7.94	7.30	7.79	7.59	7.99	8.10	7.97	8.06	7.80	7.92	7.96	7.93	7.66
21-Jul-05	22	8:00	5	8.11	6.97	7.96	6.76	7.93	7.61	7.86	8.11	7.81	8.00	8.02	7.50	7.88	7.89	7.92
23-Jul-05	24	8:00	1	8.11	6.92	8.05	7.98	7.72	7.18	7.76	8.20	7.63	8.17	8.03	7.55	7.63	7.68	7.84
23-Jul-05	24	8:00	4	8.17	8.12	7.78	8.00	7.93	7.64	8.08	8.18	8.07	8.08	7.92	7.99	8.08	7.86	7.50
27-Jul-05	28	6:00	1	8.50	6.96	8.02	8.00	7.66	7.22	7.97	8.21	6.99	8.17	8.00	7.86	8.07	8.06	7.83
27-Jul-05	28	6:00	4	8.12	7.71	8.06	8.00	7.83	7.60	8.03	8.20	7.96	8.12	7.83	8.05	8.16	7.95	7.84
27-Jul-05	28	6:00	5	8.14	7.27	8.08	7.90	7.85	7.67	8.05	8.13	7.51	8.00	7.80	7.99	8.05	7.84	8.08
27-Jul-05	28	6:00	8	8.15	7.76	8.10	7.92	7.90	7.48	8.09	8.22	7.43	8.07	7.92	8.14	8.08		8.08
			Average	**8.08**	**7.63**	**7.87**	**7.73**	**7.66**	**7.66**	**7.91**	**8.01**	**7.75**	**7.95**	**7.83**	**7.83**	**7.89**	**7.85**	**7.67**
			Minimum	7.68	6.80	7.54	6.76	6.79	7.18	7.57	7.78	6.99	7.48	7.08	7.17	7.41	7.45	6.88
			Maximum	8.50	8.12	8.10	8.00	7.97	7.89	8.09	8.22	8.07	8.17	8.10	8.14	8.16	8.08	8.08

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	1	163	161	138	133	188	133	143	139	129	139	138	139	131	141	122
29-Jun-05	0	7:50	8	150	148	135	134	144	135	143	138	131	138	133	140	134	139	124
5-Jul-05	6	6:30	4	130	142	126	126	138	124	134	129	131	132	130	135	127	128	130
5-Jul-05	6	6:30	5	130	144	127	126	136	124	132	128	130	130	129	143	129	127	129
12-Jul-05	13	8:00	4	112	127	111	112	119	105	118	116	113	113	115	117	117	117	117
12-Jul-05	13	8:00	6	113	126	111	112	121	105	123	115	112	112	115	117	117	117	116
19-Jul-05	20	7:30	1	159	183	160	166	156	137	153	155	146	152	151	158	154	153	147
19-Jul-05	20	7:30	4	154	197	155	148	156	137	153	155	147	152	152	157	154	153	147
27-Jul-05	28	6:00	1	138	172	130	130	131	116	130	133	129	130	134	133	130	127	129
27-Jul-05	28	6:00	8	130	152	129	131	130	120	130	133	130	130	132	133	130	128	128
			Average	**137.9**	**155.1**	**132.3**	**131.9**	**141.9**	**123.4**	**136.0**	**134.2**	**129.9**	**132.9**	**132.8**	**137.2**	**132.4**	**132.9**	**129.0**
			Minimum	112	126	111	112	119	105	118	115	112	112	115	117	117	117	116
			Maximum	163	197	160	166	188	137	153	155	147	152	152	158	154	153	147

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.
Ammonia (ppm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	1	<0.063	<0.063	0.112	<0.063	0.788	<0.063	0.208	0.101	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
29-Jun-05	0	7:50	8	<0.063	<0.063	0.107	<0.063	0.201	<0.063	0.137	0.084	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
27-Jul-05	28	6:00	1	<0.063	<0.063	<0.063	<0.063	0.066	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
27-Jul-05	28	6:00	8	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063		<0.063
			Average	**<0.063**	**<0.063**	**0.073**	**<0.063**	**0.272**	**<0.063**	**0.102**	**<0.063**	**<0.063**	**<0.063**	**<0.063**	**<0.063**	**<0.063**	**<0.063**	**<0.063**
			Minimum	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
			Maximum	<0.063	<0.063	0.112	<0.063	0.788	<0.063	0.208	0.101	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.
DOC (ppm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	1	3.7	4.7	5.5	5.2		6.1	5.6	3.5	9.2	4.8	10.8	6.3	7.1	6.2	13.4
29-Jun-05	0	7:50	8	3.5	7.6	3.6		5.6	6.0	4.2	4.0	7.6	4.8	10.3	5.4	6.4	5.1	11.8
27-Jul-05	28	6:00	1	4.4	10.9	1.8	2.2	2.1	2.7	1.8	2.6	2.1	1.9	1.9	2.3	2.0	2.1	2.0
27-Jul-05	28	6:00	8	1.9	11.1	1.8	1.9	1.7	1.9	1.8	1.9	2.1	1.8	1.8	4.9	2.0	2.0	2.0
			Average	**3.4**	**8.6**	**3.2**	**3.1**	**3.1**	**4.2**	**3.4**	**3.0**	**5.3**	**3.3**	**6.2**	**4.7**	**4.4**	**3.9**	**7.3**
			Minimum	1.9	4.7	1.8	1.9	1.7	1.9	1.8	1.9	2.1	1.8	1.8	2.3	2.0	2.0	2.0
			Maximum	4.4	11.1	5.5	5.2	5.6	6.1	5.6	4.0	9.2	4.8	10.8	6.3	7.1	6.2	13.4

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	3	38.8	51.2	51.6	55.2	60.0	52.8	53.2	50.8	55.6	62.4	54.8	53.6	54.0	54.0	56.8
29-Jun-05	0	7:50	7	54.4	50.0	52.4	52.8	63.2	50.8	53.2	50.8	56.4	53.6	56.8	53.2	53.6	52.0	57.6
27-Jul-05	28	6:00	3	48.0	61.2	48.0	46.8	48.8	44.4	48.0	50.8	48.8	47.6	49.2	51.2	50.4	50.0	48.0
27-Jul-05	28	6:00	7	47.6	67.6	47.2	48.8	48.8	44.8	48.4	49.6	48.8	50.0	50.4	52.8	51.2	48.8	49.6
			Average	**47.2**	**57.5**	**49.8**	**50.9**	**55.2**	**48.2**	**50.7**	**50.5**	**52.4**	**53.4**	**52.8**	**52.7**	**52.3**	**51.2**	**53.0**
			Minimum	38.8	50.0	47.2	46.8	48.8	44.4	48.0	49.6	48.8	47.6	49.2	51.2	50.4	48.8	48.0
			Maximum	54.4	67.6	52.4	55.2	63.2	52.8	53.2	50.8	56.4	62.4	56.8	53.6	54.0	54.0	57.6

Appendix Table 5. Water Chemistry Parameters fo *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 29 June 2005 to 27 July 2005.
Alkalinity (mg/L as CaCO3)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
29-Jun-05	0	7:50	2	51.2	50.0	46.8	50.8	52.8	47.6	48.0	48.4	50.8	45.6	47.6	50.0	51.2	51.6	51.2
29-Jun-05	0	7:50	6	49.6	46.4	48.8	44.4	51.6	48.0	51.2	48.8	48.8	53.2	53.2	49.2	48.4	50.0	47.2
27-Jul-05	28	6:00	2	53.2	64.4	50.8	50.8	54.4	46.8	53.6	55.2	52.4	51.6	55.6	54.4	56.4	53.6	51.6
27-Jul-05	28	6:00	6	53.6	64.8	50.8	50.8	52.4	49.2	52.4	54.0	52.8	52.4	53.6	53.6	54.8	53.2	51.6
			Average	**51.9**	**56.4**	**49.3**	**49.2**	**52.8**	**47.9**	**51.3**	**51.6**	**51.2**	**50.7**	**52.5**	**51.8**	**52.7**	**52.1**	**50.4**
			Minimum	49.6	46.4	46.8	44.4	51.6	46.8	48.0	48.4	48.8	45.6	47.6	49.2	48.4	50.0	47.2
			Maximum	53.6	64.8	50.8	50.8	54.4	49.2	53.6	55.2	52.8	53.2	55.6	54.4	56.4	53.6	51.6

APPENDIX 6

Survival and Growth of *H. azteca* following 21-d of Exposure to Ashland Harbor Reference Sediments, 12 August 2005 to 2 September 2005

Appendix Table 6. Survival and Growth of *H. azteca* following 21-d od Exposure to Ashland Harbor Reference Sediments, 12 August 2005 to 2 September 2005.

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Devivation
A	Silica Sand	1	9		
A	Silica Sand	2	10		
A	Silica Sand	3	10		
A	Silica Sand	4	10		
A	Silica Sand	5	10		
A	Silica Sand	6	10		
A	Silica Sand	7	9		
A	Silica Sand	8	10	97.5	4.6
E	SQT10	1	3		
E	SQT10	2	8		
E	SQT10	3	5		
E	SQT10	4	6		
E	SQT10	5	3		
E	SQT10	6	4		
E	SQT10	7	4		
E	SQT10	8	7	50.0	18.5
G	SQT12	1	6		
G	SQT12	2	7		
G	SQT12	3	10		
G	SQT12	4	7		
G	SQT12	5	9		
G	SQT12	6	5		
G	SQT12	7	7		
G	SQT12	8	10	76.3	18.5
M	SQT5	1	9		
M	SQT5	2	5		
M	SQT5	3	10		
M	SQT5	4	6		
M	SQT5	5	8		
M	SQT5	6	10		
M	SQT5	7	8		
M	SQT5	8	9	81.3	18.1

APPENDIX 7

Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 August 2005 to 2 September 2005

Appendix Table 7. Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 August 2005 to 2 September 2005.
Temperature (° C)

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
12-Aug-05	0	6:35	1	23.4	23.5	23.3	23.7
12-Aug-05	0	6:35	2	23.4	23.4	23.2	23.7
12-Aug-05	0	6:35	3	23.4	23.4	23.3	23.7
12-Aug-05	0	6:35	4	23.4	23.4	23.3	23.8
12-Aug-05	0	6:35	5	23.4	23.3	23.4	23.7
12-Aug-05	0	6:35	6	23.4	23.4	23.3	23.8
12-Aug-05	0	6:35	7	23.4	23.2	23.3	23.7
12-Aug-05	0	6:35	8	23.4	23.4	23.4	23.7
12-Aug-05	0	14:15	1	23.1	23.4	22.9	23.4
12-Aug-05	0	14:15	4	23.1	23.5	23.0	23.5
13-Aug-05	1	9:00	4	22.3	22.2	22.3	23.4
13-Aug-05	1	9:00	6	22.3	22.2	22.2	23.3
13-Aug-05	1	16:15	4	22.1	22.5	22.5	23.5
13-Aug-05	1	16:15	8	22.3	22.4	22.3	23.5
14-Aug-05	2	8:00	4	20.5	20.6	20.4	21.5
14-Aug-05	2	8:00	5	20.5	20.6	20.5	21.5
14-Aug-05	2	15:15	2	21.4	21.4	21.5	22.2
14-Aug-05	2	15:15	4	21.3	21.5	21.4	22.3
15-Aug-05	3	8:15	4	22.5	22.4	22.4	23.0
15-Aug-05	3	8:15	7	22.4	22.5	22.4	23.0
15-Aug-05	3	15:00	3	23.1	23.2	22.9	23.3
15-Aug-05	3	15:00	4	23.1	23.3	22.9	23.3
16-Aug-05	4	7:20	1	22.9	23.0	22.5	23.3
16-Aug-05	4	7:20	4	22.8	23.0	22.9	23.3
16-Aug-05	4	15:45	3	23.4	23.4	23.2	23.5
16-Aug-05	4	15:45	4	23.3	23.5	23.2	23.5
17-Aug-06	5	8:10	4	23.0	23.1	23.1	23.5
17-Aug-06	5	8:10	6	23.1	23.2	23.1	23.5
17-Aug-06	5	15:00	4	23.4	23.6	23.4	23.8
17-Aug-06	5	15:00	8	23.5	23.6	23.2	23.8
18-Aug-05	6	7:20	4	23.0	23.0	23.3	23.3
18-Aug-05	6	7:20	5	23.2	23.0	23.2	23.2
18-Aug-05	6	15:45	2	22.6	22.6	22.5	23.2
18-Aug-05	6	15:45	4	22.6	22.7	22.5	23.2

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
19-Aug-05	7	8:00	4	22.8	22.8	22.7	23.3
19-Aug-05	7	8:00	7	22.7	22.8	22.5	23.2
19-Aug-05	7	15:30	3	23.4	23.4	23.2	23.6
19-Aug-05	7	15:30	4	23.4	23.4	23.2	23.6
20-Aug-05	8	8:30	4	22.5	22.6	22.4	23.1
20-Aug-05	8	8:30	6	22.5	22.6	22.4	23.1
20-Aug-05	8	15:00	4	22.9	22.9	22.8	23.2
20-Aug-05	8	15:00	8	22.8	23.0	22.7	23.3
21-Aug-05	9	8:45	4	22.4	22.4	22.2	23.0
21-Aug-05	9	8:45	7	22.4	22.5	22.3	23.1
21-Aug-05	9	15:30	1	22.5	22.8	22.5	23.3
21-Aug-05	9	15:30	4	22.6	22.7	22.5	23.3
22-Aug-05	10	8:00	4	22.5	22.6	22.4	22.9
22-Aug-05	10	8:00	5	22.5	22.5	22.4	23.0
22-Aug-05	10	14:45	2	23.3	23.3	23.1	23.3
22-Aug-05	10	14:45	4	23.3	23.3	23.1	23.3
23-Aug-05	11	8:00	4	23.0	23.0	23.0	23.0
23-Aug-05	11	8:00	7	23.1	23.2	22.8	23.1
23-Aug-05	11	14:45	3	23.5	23.5	23.4	23.3
23-Aug-05	11	14:45	4	23.5	23.5	23.2	23.4
24-Aug-05	12	8:30	1	23.2	23.4	23.3	23.2
24-Aug-05	12	8:30	4	23.2	23.4	23.3	23.2
24-Aug-05	12	15:15	4	23.0	23.2	23.0	23.5
24-Aug-05	12	15:15	5	22.9	23.2	23.0	23.5
25-Aug-05	13	8:15	4	23.0	22.8	22.9	23.3
25-Aug-05	13	8:15	6	22.9	22.9	23.1	23.2
25-Aug-05	13	15:15	4	23.3	23.2	23.0	23.2
25-Aug-05	13	15:15	7	23.3	23.0	23.0	23.3
26-Aug-05	14	8:20	4	22.9	23.1	23.0	23.4
26-Aug-05	14	8:20	5	23.0	23.1	23.0	23.4
26-Aug-05	14	15:00	2	23.2	23.1	23.2	23.4
26-Aug-05	14	15:00	4	23.1	23.0	23.0	23.3
27-Aug-05	15	9:15	4	22.6	22.3	22.2	22.7
27-Aug-05	15	9:15	7	22.2	22.4	22.3	22.7
27-Aug-05	15	15:00	3	22.5	22.7	22.4	22.9
27-Aug-05	15	15:00	4	22.6	22.7	22.5	22.8

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
28-Aug-05	16	9:00	1	22.5	22.7	22.2	22.9
28-Aug-05	16	9:00	4	22.5	22.6	22.3	22.9
28-Aug-05	16	15:30	4	22.8	22.9	22.6	23.1
28-Aug-05	16	15:30	7	22.8	22.9	22.6	23.1
29-Aug-05	17	8:00	4	22.7	22.7	22.7	22.7
29-Aug-05	17	8:00	6	22.9	22.9	22.9	22.7
29-Aug-05	17	15:20	4	23.3	23.2	23.3	23.2
29-Aug-05	17	15:20	8	23.3	23.2	23.3	23.1
30-Aug-05	18	8:00	4	22.9	22.9	22.8	22.7
30-Aug-05	18	8:00	5	22.9	22.9	22.8	22.8
30-Aug-05	18	15:00	2	21.0	21.0	20.8	21.4
30-Aug-05	18	15:00	4	21.0	21.0	20.9	21.4
31-Aug-05	19	9:15	4	22.4	22.9	22.4	22.9
31-Aug-05	19	9:15	7	22.4	22.5	22.4	22.9
31-Aug-05	19	15:00	3	22.9	22.9	22.8	23.2
31-Aug-05	19	15:00	4	22.9	22.4	22.8	23.2
1-Sep-05	20	7:00	1	22.7	22.9	22.4	22.9
1-Sep-05	20	7:00	4	22.5	23.0	22.5	23.2
1-Sep-05	20	15:00	1	22.8	22.9	22.8	23.2
1-Sep-05	20	15:00	4	22.9	22.9	22.8	23.2
2-Sep-05	21	7:45	1	22.5	22.6	22.5	23.0
2-Sep-05	21	7:45	2	22.6	22.6	22.5	23.0
2-Sep-05	21	7:45	3	22.6	22.6	22.5	23.0
2-Sep-05	21	7:45	4	22.5	22.6	22.5	23.0
2-Sep-05	21	7:45	5	22.5	22.6	22.6	23.0
2-Sep-05	21	7:45	6	22.5	22.7	22.6	23.0
2-Sep-05	21	7:45	7	22.5	22.7	22.6	23.0
2-Sep-05	21	7:45	8	22.5	22.7	22.2	23.0
			Average	**22.8**	**22.8**	**22.7**	**23.1**
			Minimum	20.5	20.6	20.4	21.4
			Maximum	23.5	23.6	23.4	23.8

Appendix Table 7. Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 August 2005 to 2 September 2005.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
12-Aug-05	0	6:35	1	7.2	3.0	6.9	6.8
12-Aug-05	0	6:35	2	7.0	4.2	4.9	2.8
12-Aug-05	0	6:35	3	7.2	6.3	6.8	6.7
12-Aug-05	0	6:35	4	7.2	7.2	5.4	6.1
12-Aug-05	0	6:35	5	7.3	4.3	4.7	6.8
12-Aug-05	0	6:35	6	7.4	6.1	3.0	6.5
12-Aug-05	0	6:35	7	7.1	4.3	4.4	4.3
12-Aug-05	0	6:35	8	7.2	4.4	6.7	4.0
12-Aug-05	0	14:15	1	6.9	3.7	6.3	6.0
12-Aug-05	0	14:15	4	6.8	5.6	5.4	6.0
13-Aug-05	1	9:00	4	7.5	7.3	6.1	6.2
13-Aug-05	1	9:00	6	7.6	7.4	5.0	6.6
13-Aug-05	1	16:15	4	7.2	5.9	5.8	6.4
13-Aug-05	1	16:15	8	7.0	4.9	6.4	4.4
14-Aug-05	2	8:00	4	7.7	5.4	7.1	5.5
14-Aug-05	2	8:00	5	7.7	2.5	7.0	4.8
14-Aug-05	2	15:15	2	6.9	3.4	5.1	4.0
14-Aug-05	2	15:15	4	7.1	5.8	6.4	6.5
15-Aug-05	3	8:15	4	7.5	4.8	7.0	6.8
15-Aug-05	3	8:15	7	7.4	5.5	7.1	6.9
15-Aug-05	3	15:00	3	7.5	5.1	6.8	6.1
15-Aug-05	3	15:00	4	7.5	6.1	7.0	6.8
16-Aug-05	4	7:20	1	7.4	4.4	5.9	7.5
16-Aug-05	4	7:20	4	7.5	6.4	6.7	7.6
16-Aug-05	4	15:45	3	7.0	4.2	6.9	7.4
16-Aug-05	4	15:45	4	6.6	4.1	7.0	5.6
17-Aug-06	5	8:10	4	7.5	5.0	6.7	5.9
17-Aug-06	5	8:10	6	7.3	4.6	6.7	6.2
17-Aug-06	5	15:00	4	6.8	5.8	7.1	5.5
17-Aug-06	5	15:00	8	6.9	3.8	5.8	4.9
18-Aug-05	6	7:20	4	6.9	5.9	7.4	5.2
18-Aug-05	6	7:20	5	7.4	4.6	6.6	5.9
18-Aug-05	6	15:45	2	7.4	9.4	7.7	7.0
18-Aug-05	6	15:45	4	7.6	6.9	7.4	6.3

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
19-Aug-05	7	8:00	4	7.4	2.1	7.4	5.7
19-Aug-05	7	8:00	7	7.4	5.5	7.5	5.8
19-Aug-05	7	15:30	3	7.2	7.0	7.3	5.5
19-Aug-05	7	15:30	4	7.2	7.2	7.2	5.9
20-Aug-05	8	8:30	4	7.8	7.3	7.8	7.3
20-Aug-05	8	8:30	6	7.3	5.6	7.8	7.0
20-Aug-05	8	15:00	4	7.8	7.6	7.9	6.7
20-Aug-05	8	15:00	8	7.8	6.6	7.5	6.0
21-Aug-05	9	8:45	4	7.6	6.9	7.4	7.3
21-Aug-05	9	8:45	7	7.9	7.1	7.1	7.1
21-Aug-05	9	15:30	1	8.0	6.4	8.2	5.0
21-Aug-05	9	15:30	4	8.2	7.6	8.3	6.7
22-Aug-05	10	8:00	4	7.8	7.1	7.8	7.9
22-Aug-05	10	8:00	5	7.8	6.8	8.1	7.6
22-Aug-05	10	14:45	2	7.3	6.8	6.8	6.9
22-Aug-05	10	14:45	4	7.1	6.0	6.7	7.0
23-Aug-05	11	8:00	4	6.8	6.4	7.2	7.1
23-Aug-05	11	8:00	7	7.4	6.9	6.6	7.3
23-Aug-05	11	14:45	3	7.5	5.3	7.2	8.0
23-Aug-05	11	14:45	4	7.4	5.3	7.1	7.4
24-Aug-05	12	8:30	1	7.5	7.2	6.6	7.0
24-Aug-05	12	8:30	4	7.7	4.8	7.0	7.2
24-Aug-05	12	15:15	4	7.6	7.7	7.3	6.1
24-Aug-05	12	15:15	5	7.5	4.0	7.0	5.3
25-Aug-05	13	8:15	4	7.4	6.9	7.6	6.6
25-Aug-05	13	8:15	6	7.0	6.9	7.9	7.4
25-Aug-05	13	15:15	4	7.2	7.4	7.6	6.3
25-Aug-05	13	15:15	7	6.9	7.2	7.2	6.7
26-Aug-05	14	8:20	4	7.6	6.1	7.1	5.6
26-Aug-05	14	8:20	5	7.6	4.3	6.2	5.2
26-Aug-05	14	15:00	2	7.6	6.9	7.4	6.9
26-Aug-05	14	15:00	4	7.4	7.1	7.3	6.1
27-Aug-05	15	9:15	4	7.0	6.3	8.0	5.9
27-Aug-05	15	9:15	7	6.9	8.0	8.1	6.5
27-Aug-05	15	15:00	3	7.6	6.0	7.8	7.1
27-Aug-05	15	15:00	4	7.4	4.1	7.3	7.1

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
28-Aug-05	16	9:00	1	7.4	5.5	7.3	7.4
28-Aug-05	16	9:00	4	7.6	5.6	7.4	6.8
28-Aug-05	16	15:30	4	8.1	7.0	7.3	6.9
28-Aug-05	16	15:30	7	8.0	6.7	6.7	5.6
29-Aug-05	17	8:00	4	7.5	6.7	6.7	6.2
29-Aug-05	17	8:00	6	7.4	7.6	8.0	7.1
29-Aug-05	17	15:20	4	7.6	5.3	7.0	5.7
29-Aug-05	17	15:20	8	7.8	6.0	6.5	4.8
30-Aug-05	18	8:00	4	8.2	6.1	8.0	7.3
30-Aug-05	18	8:00	5	7.7	4.4	7.7	6.7
30-Aug-05	18	15:00	2	8.7	7.4	7.7	7.6
30-Aug-05	18	15:00	4	8.4	6.1	7.7	7.7
31-Aug-05	19	9:15	4	8.0	6.9	7.8	6.6
31-Aug-05	19	9:15	7	7.8	7.4	7.6	7.3
31-Aug-05	19	15:00	3	7.5	7.1	7.1	6.1
31-Aug-05	19	15:00	4	7.7	6.2	6.7	5.4
1-Sep-05	20	7:00	1	7.2	6.9	7.4	6.9
1-Sep-05	20	7:00	4	7.6	7.2	6.1	6.0
1-Sep-05	20	15:00	1	8.4	9.7	6.2	7.8
1-Sep-05	20	15:00	4	8.4	6.9	6.7	7.6
2-Sep-05	21	7:45	1	8.1	6.0	7.4	7.4
2-Sep-05	21	7:45	2	7.8	3.7	7.0	6.9
2-Sep-05	21	7:45	3	7.8	5.4	7.4	7.3
2-Sep-05	21	7:45	4	8.0	7.3	7.2	6.9
2-Sep-05	21	7:45	5	7.8	6.6	7.6	7.0
2-Sep-05	21	7:45	6	8.1	7.4	7.0	7.4
2-Sep-05	21	7:45	7	7.7	7.0	7.2	7.6
2-Sep-05	21	7:45	8	7.9	7.4	7.6	6.2
			Average	**7.5**	**6.0**	**7.0**	**6.4**
			Minimum	6.6	2.1	3.0	2.8
			Maximum	8.7	9.7	8.3	8.0

Appendix Table 7. Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 August 2005 to 2 September 2005.
pH

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
12-Aug-05	0	6:35	1	8.12	7.54	7.93	7.91
12-Aug-05	0	6:35	4	8.11	7.85	7.90	7.88
12-Aug-05	0	6:35	5	8.12	7.45	7.88	7.88
12-Aug-05	0	6:35	8	8.16	7.35	7.97	7.20
15-Aug-05	3	8:00	4	8.10	7.67	8.03	7.99
15-Aug-05	3	8:00	7	8.13	8.10	7.97	7.97
18-Aug-05	6	7:20	4	8.10	7.50	8.06	7.96
18-Aug-05	6	7:20	5	8.19	7.46	8.11	7.97
20-Aug-05	8	8:30	4	8.17	8.03	8.04	7.87
20-Aug-05	8	8:30	6	8.16	7.83	8.04	7.86
22-Aug-05	10	8:00	4	8.06	7.90	8.02	8.01
22-Aug-05	10	8:00	5	8.08	7.60	8.12	8.01
25-Aug-05	13	8:15	4	8.01	7.96	8.00	7.96
25-Aug-05	13	8:15	6	8.03	7.81	8.04	8.00
27-Aug-05	15	9:15	4	8.20	7.73	8.07	7.64
27-Aug-05	15	9:15	7	*	7.99	8.02	7.73
29-Aug-05	17	8:00	4	8.31	7.32	8.12	7.96
29-Aug-05	17	8:00	6	8.22	7.16	8.00	7.81
1-Sep-05	20	7:00	1	8.06	8.00	8.27	7.91
1-Sep-05	20	7:00	4	8.12	7.97	8.19	7.97
2-Sep-05	21	7:45	1	8.27	7.73	8.06	8.09
2-Sep-05	21	7:45	4	8.24	7.98	7.97	7.95
2-Sep-05	21	7:45	5	8.27	7.95	8.08	8.10
2-Sep-05	21	7:45	8	8.24	7.96	8.10	8.03
			Average	**8.15**	**7.74**	**8.04**	**7.90**
			Minimum	8.01	7.16	7.88	7.20
			Maximum	8.31	8.10	8.27	8.10

* Data point not recorded

Appendix Table 7. Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 August 2005 to 2 September 2005.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
12-Aug-05	0	6:35	1	122	144	125	129
12-Aug-05	0	6:35	8	122	157	125	140
18-Aug-05	6	7:20	4	113	126	119	115
18-Aug-05	6	7:20	5	114	128	118	116
25-Aug-05	13	8:15	4	111	132	115	116
25-Aug-05	13	8:15	6	113	126	117	112
1-Sep-05	20	7:00	1	117	117	112	117
1-Sep-05	20	7:00	4	114	117	113	117
2-Sep-05	21	7:45	1	128	131	132	130
2-Sep-05	21	7:45	8	128	133	129	130
			Average	**118**	**131**	**120**	**122**
			Minimum	111	117	112	112
			Maximum	128	157	132	140

Appendix Table 7. Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 Aug
nmonia (ppm)

Date	Day	Rep	Silica Sand	SQT10	SQT12	SQT5
12-Aug-05	0	1	0.077	0.884	0.486	<0.063
12-Aug-05	0	8	0.073	2.608	0.399	<0.063
13-Aug-05	1	1	0.102	1.804	0.691	<0.063
13-Aug-05	1	8	0.102	1.041	0.726	<0.063
14-Aug-05	2	1	1.95	1.343	0.801	<0.063
14-Aug-05	2	8	0.125	0.126	0.726	0.141
15-Aug-05	3	1	0.147	2.534	0.686	<0.063
15-Aug-05	3	8	0.158	1.531	0.694	<0.063
16-Aug-05	4	1	0.217	3.432	0.677	0.102
16-Aug-05	4	8	0.223	2.831	0.967	0.135
17-Aug-05	5	1	0.376	1.837	0.731	0.103
17-Aug-05	5	8	0.318	1.632	0.752	0.101
18-Aug-05	6	1	0.261	1.786	0.764	0.127
18-Aug-05	6	8	0.260	1.346	0.780	0.104
19-Aug-05	7	1	0.234	1.868	0.681	0.071
19-Aug-05	7	8	0.215	1.461	0.668	0.064
20-Aug-05	8	1	0.200	1.594	0.781	0.069
20-Aug-05	8	8	0.205	1.327	0.617	<0.063
21-Aug-05	9	1	0.174	1.311	0.578	<0.063
21-Aug-05	9	8	0.171	1.039	0.612	<0.063
22-Aug-05	10	1	0.166	1.295	0.491	0.085
22-Aug-05	10	8	0.169	1.022	0.513	<0.063
23-Aug-05	11	1	0.203	0.841	0.515	<0.063
23-Aug-05	11	8	0.222	0.958	0.503	0.068
24-Aug-05	12	1	0.188	0.912	0.535	0.076
24-Aug-05	12	8	0.208	0.868	0.59	0.088
25-Aug-05	13	1	0.169	0.696	0.321	0.126
25-Aug-05	13	8	0.184	0.866	0.265	<0.063
26-Aug-05	14	1	0.118	0.539	0.169	<0.063
26-Aug-05	14	8	0.127	0.621	0.278	0.068
29-Aug-05	17	1	0.091	0.38	0.078	<0.063
29-Aug-05	17	8	0.088	0.305	0.105	<0.063
31-Aug-05	19	1	0.121	0.242	<0.063	<0.063
31-Aug-05	19	8	0.099	0.236	0.103	<0.063
2-Sep-05	21	1	<0.063	0.235	<0.063	<0.063
2-Sep-05	21	8	<0.063	0.139	<0.063	<0.063
		Average	**0.217**	**1.21**	**0.511**	**<0.063**
		Minimum	<0.063	0.126	<0.063	<0.063
		Maximum	1.95	3.432	0.967	0.141

Appendix Table 7. Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 August 2005 to 2 September 2005.
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
12-Aug-05	0	6:35	3	47.2	51.2	48	53.2
12-Aug-05	0	6:35	7	No sample	53.2	50.4	59.2
2-Sep-05	28	7:45	3	49.6	51.6	46.4	48
2-Sep-05	28	7:45	7	46.4	49.6	48.4	47.6
			Average	**47.7**	**51.4**	**48.3**	**52.0**
			Minimum	46.4	49.6	46.4	47.6
			Maximum	49.6	53.2	50.4	59.2

Appendix Table 7. Water Chemistry Parameters for *H. azteca* Exposed to Sediments from Ashland Harbor, 12 August 2005 to 2 September 2005.
Alkalinity (mg/L as CaCO3)

Date	Day	Time	Rep	Silica Sand	SQT10	SQT12	SQT5
12-Aug-05	0	6:35	2	54	63.2	62.4	60
12-Aug-05	0	6:35	6	42	58.4	68.4	58
2-Sep-05	28	7:45	2	53.2	58	52.8	56.8
2-Sep-05	28	7:45	6	54.4	54.8	53.2	54
			Average	**50.9**	**58.6**	**59.2**	**57.2**
			Minimum	42.0	54.8	52.8	54.0
			Maximum	54.4	63.2	68.4	60.0

APPENDIX 8

Survival and Growth of *H. azteca* following 28-d of Exposure to Ashland Harbor Sediments, 7 October 2005 to 11 November 2005

Appendix Table 8. Survival and Growth of *H.azteca* following 28-d of Exposure to Ashland Harbor Sediments, 7 October 2005 to 4 November 2005.

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Number Weighed	Total Dry Wt (mg)	Individual Dry Wt (mg)	Average Dry Wt (mg)	Standard Deviation
A	Silica Sand	1	9			9	4.3	0.48		
A	Silica Sand	2	10			10	4.1	0.41		
A	Silica Sand	3	10			10	4.9	0.49		
A	Silica Sand	4	9			9	3.3	0.37		
A	Silica Sand	5	8			8	4.3	0.54		
A	Silica Sand	6	8			8	5.3	0.66		
A	Silica Sand	7	8			7	3.3	0.47		
A	Silica Sand	8	8	87.5	8.9	8	3.6	0.45	0.48	0.09
B	Form. Sediment	1	2			2	1.4	0.70		
B	Form. Sediment	2	0			0				
B	Form. Sediment	3	2			2	1.9	0.95		
B	Form. Sediment	4	1			1	0.9	0.90		
B	Form. Sediment	5	2			2	1.4	0.70		
B	Form. Sediment	6	2			2	2.2	1.10		
B	Form. Sediment	7	4			4	3.2	0.80		
B	Form. Sediment	8	3	20.0	12.0	3	2.4	0.80	0.85	0.14
C	W. Bearskin	1	9			8	1.7	0.21		
C	W. Bearskin	2	6			6	1.9	0.32		
C	W. Bearskin	3	10			10	1.9	0.19		
C	W. Bearskin	4	10			10	1.9	0.19		
C	W. Bearskin	5	7			7	2	0.29		
C	W. Bearskin	6	9			9	2.2	0.24		
C	W. Bearskin	7	10			9	2.2	0.24		
C	W. Bearskin	8	10	88.8	15.5	10	2.4	0.24	0.24	0.04
D	SQT9	1	9			9	2	0.22		
D	SQT9	2	5			5	1.9	0.38		
D	SQT9	3	5			5	1.7	0.34		
D	SQT9	4	8			8	2.4	0.30		
D	SQT9	5	5			5	2.7	0.54		
D	SQT9	6	5			5	2.3	0.46		
D	SQT9	7	8			8	2.8	0.35		
D	SQT9	8	7	65.0	16.9	7	2.3	0.33	0.37	0.10
E	SQT13	1	6			6	1.9	0.32		
E	SQT13	2	5			5	1.9	0.38		
E	SQT13	3	5			5	2.1	0.42		
E	SQT13	4	2			2	0.8	0.40		
E	SQT13	5	0			0				
E	SQT13	6	6			6	2.8	0.47		
E	SQT13	7	4			4	1.8	0.45		
E	SQT13	8	2	37.5	21.9	2	1.2	0.60	0.43	0.09
F	SQT11	1	8			8	2.3	0.29		
F	SQT11	2	8			8	2.2	0.28		
F	SQT11	3	9			9	1.7	0.19		
F	SQT11	4	10			10	1.8	0.18		
F	SQT11	5	9			9	2.3	0.26		
F	SQT11	6	8			8	2.7	0.34		
F	SQT11	7	8			8	2.3	0.29		
F	SQT11	8	8	85.0	7.6	8	1.9	0.24	0.26	0.05
G	SQT14	1	8			8	2.2	0.28		
G	SQT14	2	5			5	2	0.40		
G	SQT14	3	10			10	2.9	0.29		
G	SQT14	4	3			3	1.7	0.57		
G	SQT14	5	2			2	0.8	0.40		
G	SQT14	6	4			4	1.2	0.30		
G	SQT14	7	6			6	2.1	0.35		
G	SQT14	8	4	52.5	26.6	4	0.7	0.18	0.34	0.12

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Number Weighed	Total Dry Wt (mg)	Individual Dry Wt (mg)	Average Dry Wt (mg)	Standard Deviation
H	SQT6	1	8			8	1.5	0.19		
H	SQT6	2	9			9	1.9	0.21		
H	SQT6	3	10			10	2	0.20		
H	SQT6	4	9			9	1.9	0.21		
H	SQT6	5	9			9	2.7	0.30		
H	SQT6	6	10			10	2.4	0.24		
H	SQT6	7	7			7	2.3	0.33		
H	SQT6	8	10	90.0	10.7	8	1.8	0.23	0.24	0.05
I	SQT2	1	7			7	3.4	0.49		
I	SQT2	2	9			9	2.1	0.23		
I	SQT2	3	7			8	2.5	0.31		
I	SQT2	4	10			9	2.9	0.32		
I	SQT2	5	9			9	2.1	0.23		
I	SQT2	6	8			8	3.1	0.39		
I	SQT2	7	10			10	2.1	0.21		
I	SQT2	8	7	83.8	13.0	7	1.8	0.26	0.31	0.09
J	SQT7	1	2			2	1.2	0.60		
J	SQT7	2	2			2	0.9	0.45		
J	SQT7	3	0			0				
J	SQT7	4	0			0				
J	SQT7	5	4			4	1	0.25		
J	SQT7	6	2			2	1.1	0.55		
J	SQT7	7	0			0				
J	SQT7	8	4	17.5	16.7	4	0.8	0.20	0.41	0.18
K	SQT4	1	10			10	2.1	0.21		
K	SQT4	2	8			8	2.2	0.28		
K	SQT4	3	6			6	1.3	0.22		
K	SQT4	4	10			10	2.6	0.26		
K	SQT4	5	9			9	2.2	0.24		
K	SQT4	6	9			9	2.7	0.30		
K	SQT4	7	10			10	2.4	0.24		
K	SQT4	8	10	90.0	14.1	10	3.1	0.31	0.26	0.04
L	SQT3	1	8			8	2.3	0.29		
L	SQT3	2	8			8	2.3	0.29		
L	SQT3	3	9			9	2.2	0.24		
L	SQT3	4	9			10	2.6	0.26		
L	SQT3	5	9			9	2.4	0.27		
L	SQT3	6	10			10	2.3	0.23		
L	SQT3	7	10			10	2.5	0.25		
L	SQT3	8	7	87.5	10.4	6	1.8	0.30	0.27	0.02
M	SQT5	1	8			8	1.5	0.19		
M	SQT5	2	8			8	2.3	0.29		
M	SQT5	3	7			7	1.8	0.26		
M	SQT5	4	9			9	2.3	0.26		
M	SQT5	5	8			8	1.9	0.24		
M	SQT5	6	9			8	2.2	0.28		
M	SQT5	7	10			10	2.4	0.24		
M	SQT5	8	6	81.3	12.5	6	2.1	0.35	0.26	0.05
N	SQT 1	1	0			0				
N	SQT 1	2	0			0				
N	SQT 1	3	0			0				
N	SQT 1	4	0			0				
N	SQT 1	5	0			0				
N	SQT 1	6	0			0				
N	SQT 1	7	0			0				
N	SQT 1	8	0	0.0	0.0	0				

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Number Weighed	Total Dry Wt (mg)	Individual Dry Wt (mg)	Average Dry Wt (mg)	Standard Deviation
O	SQT8	1	8			8	1.9	0.24		
O	SQT8	2	10			10	2.9	0.29		
O	SQT8	3	9			9	2.3	0.26		
O	SQT8	4	8			8	2.1	0.26		
O	SQT8	5	9			9	3.1	0.34		
O	SQT8	6	7			7	1.7	0.24		
O	SQT8	7	8			8	1.8	0.23		
O	SQT8	8	9	85.0	9.3	9	2.2	0.24	0.26	0.04

APPENDIX 9

Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 11 November 2005

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.
Temperature (° C)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	1	23.0	23.0	23.1	22.8	22.8	22.8	23.1	22.8	22.7	22.9	22.9	22.9	22.4	22.9	22.4
7-Oct-05	0	7:00	2	23.1	23.2	23.1	22.8	22.8	22.7	23.0	23.0	22.9	23.0	22.8	23.0	22.7	23.0	22.7
7-Oct-05	0	7:00	3	23.1	23.0	23.2	23.0	22.9	22.9	22.9	23.1	22.7	22.8	22.8	22.9	22.5	23.0	22.5
7-Oct-05	0	7:00	4	23.1	23.1	23.1	23.1	22.9	22.9	22.9	23.2	22.9	22.8	22.9	22.9	22.6	23.1	22.7
7-Oct-05	0	7:00	5	23.0	23.1	23.0	22.9	22.9	22.9	22.9	22.9	22.8	22.8	23.0	22.9	22.5	22.8	22.9
7-Oct-05	0	7:00	6	23.0	23.1	23.0	23.0	23.0	22.9	22.9	22.8	22.8	22.8	23.1	22.9	22.6	22.8	22.9
7-Oct-05	0	7:00	7	23.1	23.1	23.0	22.8	22.9	22.8	23.0	22.8	22.7	22.8	22.9	22.8	22.6	23.0	22.6
7-Oct-05	0	7:00	8	23.0	23.1	23.0	23.0	22.9	22.8	22.8	22.7	22.6	22.8	23.0	22.9	22.6	22.8	22.7
7-Oct-05	0	15:30	1	23.2	23.3	23.3	23.2	23.2	23.1	23.3	23.4	23.2	23.3	23.3	23.2	23.0	23.2	23.0
7-Oct-05	0	15:30	4	23.2	23.3	23.4	23.3	23.3	23.2	23.2	23.4	23.3	23.3	23.2	23.3	23.2	23.3	23.1
8-Oct-05	1	9:30	4	22.0	22.5	22.2	22.4	22.0	21.9	21.9	22.4	22.4	22.3	22.0	22.1	22.2	22.3	22.4
8-Oct-05	1	9:30	6	22.0	22.4	22.2	22.4	22.1	21.9	21.9	22.4	22.4	22.3	22.0	22.5	22.4	22.0	22.4
8-Oct-05	1	16:15	4	22.2	22.4	22.3	22.6	22.2	22.2	22.1	22.6	22.6	22.4	22.4	22.5	22.3	22.1	22.6
8-Oct-05	1	16:15	8	22.3	22.4	22.4	22.6	22.3	22.0	21.8	22.6	22.6	22.4	22.3	22.5	22.1	22.1	22.5
9-Oct-05	2	9:30	4	22.3	22.4	22.5	22.4	22.4	22.3	22.1	22.4	22.4	22.4	22.3	22.5	22.3	22.3	22.4
9-Oct-05	2	9:30	5	22.4	22.3	22.4	22.3	22.4	22.2	22.3	22.3	22.3	22.3	22.4	22.4	22.4	22.4	22.4
9-Oct-05	2	17:30	2	22.2	22.4	22.6	22.5	22.6	22.3	22.2	22.1	22.2	22.5	22.1	22.3	22.0	22.6	22.4
9-Oct-05	2	17:30	4	22.3	22.6	22.6	22.4	22.4	22.1	22.3	22.4	22.4	22.6	22.3	22.4	22.4	22.4	22.4
10-Oct-05	3	9:00	4	22.0	22.2	22.4	22.4	22.0	21.8	22.0	22.2	22.2	22.1	21.8	22.0	22.0	22.2	22.2
10-Oct-05	3	9:00	7	22.0	22.5	22.6	22.1	21.8	22.0	21.9	22.1	22.1	22.0	21.9	22.0	22.0	22.1	22.1
10-Oct-05	3	15:30	3	22.3	23.4	22.6	22.5	22.2	22.2	22.2	22.6	22.5	22.6	22.3	22.4	22.4	22.5	22.4
10-Oct-05	3	15:30	4	22.3	22.5	22.6	22.5	22.2	22.2	22.2	22.6	22.6	22.6	22.3	22.6	22.1	22.5	22.5
11-Oct-05	4	8:40	1	22.3	22.4	22.6	22.4	22.0	22.1	22.1	22.4	22.5	22.4	22.2	22.6	22.3	22.4	22.4
11-Oct-05	4	8:40	4	22.3	22.5	22.5	22.6	22.1	22.0	22.2	22.4	22.5	22.5	22.1	22.5	22.4	22.4	22.4
11-Oct-05	4	15:00	3	22.7	22.7	22.8	22.7	22.6	22.6	22.7	22.8	22.5	22.5	22.6	22.7	22.4	22.7	22.4
11-Oct-05	4	15:00	4	22.8	22.7	22.8	22.7	22.6	22.6	22.7	22.8	22.6	22.5	22.7	22.7	22.7	22.7	22.6
12-Oct-05	5	9:30	4	22.7	22.6	22.7	22.7	22.6	22.5	22.6	22.7	22.6	22.6	22.6	22.6	22.5	22.6	22.6
12-Oct-05	5	9:30	6	22.8	22.7	22.7	22.7	22.7	22.5	22.7	22.6	22.6	22.5	22.6	22.5	22.4	22.6	22.6
12-Oct-05	5	15:45	4	22.8	22.7	22.8	22.8	22.7	22.7	22.7	22.8	22.7	22.6	22.6	22.7	22.6	22.7	22.5
12-Oct-05	5	15:45	8	22.8	22.8	22.8	22.7	22.7	22.6	22.6	22.8	22.7	22.6	22.7	22.7	22.5	22.7	22.6
13-Oct-05	6	8:40	4	22.7	22.6	22.7	22.6	22.5	22.5	22.6	22.8	22.8	22.6	22.7	22.6	22.7	22.7	22.5
13-Oct-05	6	8:40	5	22.7	22.7	22.7	22.6	22.5	22.5	22.5	22.8	22.7	22.6	22.7	22.6	22.4	22.7	22.2
13-Oct-05	6	15:20	2	22.9	22.9	22.9	22.8	22.8	22.8	22.9	22.9	23.0	22.9	22.9	22.9	22.8	22.9	22.9
13-Oct-05	6	15:20	4	22.9	22.9	22.8	22.9	22.9	22.8	22.9	22.9	23.0	22.9	22.8	22.9	22.8	22.9	22.9
14-Oct-05	7	8:15	4	22.6	22.5	22.8	22.6	22.6	22.5	22.6	22.8	22.8	22.7	22.6	22.8	22.6	22.6	22.6
14-Oct-05	7	8:15	7	22.7	22.7	22.8	22.7	22.6	22.6	22.6	22.8	22.8	22.8	22.7	22.8	22.6	22.6	22.6
14-Oct-05	7	15:15	3	22.9	22.8	22.9	22.9	22.8	22.7	22.8	22.8	22.8	22.6	22.8	23.0	22.7	22.8	22.8
14-Oct-05	7	15:15	4	23.0	22.8	22.9	22.9	22.8	22.8	22.8	22.9	22.8	22.7	22.8	22.9	22.8	22.9	22.9
15-Oct-05	8	8:15	4	22.4	22.6	22.7	22.5	22.4	22.4	22.4	22.6	22.5	22.5	22.4	22.6	22.4	22.4	22.4
15-Oct-05	8	8:15	6	22.8	22.6	22.6	22.5	22.4	22.2	22.4	22.6	22.5	22.5	22.5	22.6	22.3	22.0	22.4
15-Oct-05	8	15:30	4	22.7	22.6	22.6	22.7	22.5	22.5	22.6	22.6	22.7	22.6	22.4	22.5	22.5	22.6	22.7
15-Oct-05	8	15:30	8	22.7	22.6	22.7	22.7	22.5	22.4	22.5	22.7	22.6	22.6	22.5	22.6	22.6	22.7	22.8
16-Oct-05	9	9:30	4	22.5	22.5	22.5	22.6	22.3	22.3	22.3	22.5	22.5	22.4	22.3	22.4	22.4	22.6	22.5
16-Oct-05	9	9:30	7	22.6	22.6	22.5	22.5	22.5	22.3	22.4	22.5	22.5	22.4	22.4	22.5	22.4	22.6	22.4
16-Oct-05	9	17:30	1	22.9	22.5	22.5	22.6	22.9	22.8	22.8	22.5	22.5	22.7	22.7	22.6	22.5	22.6	22.6
16-Oct-05	9	17:30	4	22.9	22.5	22.6	22.4	22.8	22.8	22.7	22.6	22.6	22.7	23.0	22.6	22.6	22.7	22.6
17-Oct-05	10	8:00	4	22.9	22.4	22.6	22.6	22.8	22.4	22.9	22.6	22.6	22.4	22.9	22.6	22.4	22.7	22.5
17-Oct-05	10	8:00	5	22.9	22.6	22.7	22.5	22.8	22.6	23.0	22.4	22.5	22.3	22.8	22.5	22.4	22.5	22.5
17-Oct-05	10	15:50	2	22.5	22.6	22.6	22.5	22.6	22.7	22.6	22.7	22.6	22.5	22.6	22.6	22.5	22.7	22.3
17-Oct-05	10	15:50	4	22.5	22.6	22.6	22.6	22.6	22.5	22.7	22.6	22.5	22.4	22.6	22.6	22.5	22.7	22.3
18-Oct-05	11	8:30	4	22.6	22.4	22.7	22.6	22.5	22.3	22.3	22.2	22.5	22.5	22.5	22.5	22.3	22.6	22.1
18-Oct-05	11	8:30	7	22.5	22.4	22.6	22.4	22.5	22.3	22.5	22.3	22.3	22.5	22.5	22.5	22.0	22.4	22.6
18-Oct-05	11	15:20	3	22.7	22.8	22.7	22.7	22.7	22.4	22.6	22.8	22.6	22.6	22.7	22.6	22.5	22.5	22.5
18-Oct-05	11	15:20	4	22.7	22.7	22.7	22.7	22.5	22.6	22.7	22.7	22.7	22.6	22.7	22.7	22.5	22.6	22.5
19-Oct-05	12	8:15	1	22.6	22.4	22.5	22.3	22.3	22.2	22.3	22.4	22.3	22.4	22.2	22.4	22.4	22.4	22.3
19-Oct-05	12	8:15	4	22.6	22.3	22.6	22.4	22.3	22.3	22.3	22.4	22.5	22.4	22.3	22.5	22.3	22.4	22.5
19-Oct-05	12	15:20	4	22.7	22.6	22.6	22.7	22.6	22.6	22.6	22.7	22.7	22.4	22.6	22.6	22.5	22.7	22.3
19-Oct-05	12	15:20	5	22.7	22.6	22.6	22.6	22.6	22.5	22.6	22.6	22.6	22.4	22.7	22.5	22.3	22.5	22.5
20-Oct-05	13	8:15	4	22.6	22.4	22.5	22.4	22.2	22.3	22.3	22.3	22.3	22.3	22.2	22.3	22.2	22.3	22.3
20-Oct-05	13	8:15	6	22.6	22.3	22.5	22.4	22.2	22.2	22.4	22.4	22.3	22.3	22.2	22.3	22.4	22.2	22.3
20-Oct-05	13	15:25	4	22.8	22.7	22.7	22.7	22.6	22.6	22.6	22.7	22.6	22.5	22.5	22.6	22.5	22.6	22.4
20-Oct-05	13	15:25	8	22.8	22.7	22.6	22.8	22.6	22.6	22.6	22.7	22.5	22.5	22.6	22.6	22.3	22.6	22.4
21-Oct-05	14	8:15	4	22.5	22.4	22.5	22.4	22.4	22.2	22.4	22.3	22.4	22.4	22.5	22.4	22.2	22.2	22.3
21-Oct-05	14	8:15	5	22.6	22.4	22.6	22.4	22.4	22.2	22.4	22.3	22.4	22.4	22.5	22.4	22.2	22.3	22.3
21-Oct-05	14	15:15	2	22.7	22.5	22.5	22.4	22.4	22.4	22.4	22.4	22.3	22.2	22.4	22.5	22.2	22.3	22.3
21-Oct-05	14	15:15	4	22.6	22.5	22.6	22.4	22.4	22.4	22.4	22.4	22.3	22.2	22.4	22.4	22.2	22.2	22.3
22-Oct-05	15	9:00	4	22.3	22.2	22.3	22.2	22.1	22.0	22.1	22.2	22.1	22.0	22.1	22.4	22.1	22.6	21.9
22-Oct-05	15	9:00	7	22.3	22.1	22.4	22.1	22.2	22.1	22.1	22.2	22.1	22.1	22.2	22.1	21.9	21.9	22.1
22-Oct-05	15	18:00	3	22.3	22.2	22.4	22.3	22.2	22.2	22.3	22.3	22.2	22.0	22.3	22.1	21.8	22.1	21.9
22-Oct-05	15	18:00	4	22.4	22.2	22.4	22.2	22.2	22.3	22.4	22.3	22.3	22.1	22.3	21.9	22.0	22.1	22.0
23-Oct-05	16	9:00	1	22.2	22.2	22.4	22.1	22.1	21.9	21.9	22.1	22.1	22.2	22.0	22.2	22.1	22.1	22.0
23-Oct-05	16	9:00	4	22.1	22.3	22.5	22.2	22.1	21.9	22.0	22.1	22.3	22.1	22.1	22.2	22.1	22.2	22.1

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
24-Oct-05	17	8:15	4	22.3	22.1	22.4	22.3	22.0	22.1	22.1	22.2	22.1	22.1	21.9	21.9	22.0	21.7	22.0
24-Oct-05	17	8:15	6	22.2	22.1	22.2	22.3	22.0	21.9	22.0	22.2	22.2	22.1	21.9	22.1	22.0	21.9	22.0
24-Oct-05	17	16:25	4	22.7	22.7	22.9	22.8	22.5	22.5	22.5	22.7	22.9	22.6	22.5	22.8	22.6	22.8	22.6
24-Oct-05	17	16:25	8	22.7	22.7	22.9	22.7	22.5	22.6	22.5	22.7	22.7	22.7	22.7	22.8	22.6	22.8	22.6
25-Oct-05	18	6:00	4	22.4	22.5	22.7	22.7	22.4	22.4	22.4	22.5	22.7	22.7	22.3	22.6	22.4	22.4	22.4
25-Oct-05	18	6:00	5	22.6	22.5	22.6	22.7	22.5	22.4	22.3	22.5	22.7	22.6	22.4	22.6	22.3	22.4	22.5
25-Oct-05	18	15:00	2	22.4	22.5	22.5	22.4	22.5	22.5	22.3	22.4	22.5	22.5	22.5	22.4	22.5	22.4	22.4
25-Oct-05	18	15:00	4	22.5	22.6	22.5	22.5	22.4	22.5	22.5	22.5	22.5	22.5	22.4	22.5	22.3	22.5	22.4
26-Oct-05	19	8:00	4	22.4	22.3	22.4	22.2	22.0	22.0	22.2	22.4	22.3	22.2	22.2	22.3	22.3	22.1	22.2
26-Oct-05	19	8:00	7	22.4	22.3	22.5	22.3	22.1	22.0	22.2	22.5	22.3	22.3	22.3	22.4	22.3	22.2	22.3
26-Oct-05	19	15:30	3	22.4	22.4	22.5	23.5	22.3	22.3	22.3	22.4	22.5	22.5	22.5	22.5	22.4	22.7	22.4
26-Oct-05	19	15:30	4	22.5	22.6	22.6	22.6	22.4	22.3	22.3	22.6	22.7	22.4	22.5	22.6	22.5	22.7	22.6
27-Oct-05	20	8:00	1	22.3	22.4	22.5	22.5	22.3	22.3	22.3	22.4	22.3	22.1	22.3	22.3	22.2	22.3	22.4
27-Oct-05	20	8:00	4	22.4	22.5	22.5	22.4	22.4	22.2	22.1	22.4	22.4	22.2	22.1	22.4	22.3	22.2	22.2
27-Oct-05	20	15:00	2	22.4	22.4	22.5	22.6	22.5	22.2	22.4	22.5	22.5	22.4	22.4	22.3	22.4	22.5	22.4
27-Oct-05	20	15:00	4	22.5	22.4	22.6	22.6	22.4	22.2	22.5	22.6	22.5	22.2	22.3	22.5	22.5	22.8	22.4
28-Oct-05	21	8:00	4	22.4	22.6	22.5	22.4	22.4	22.4	22.1	22.4	22.4	22.0	22.2	22.3	22.3	22.4	22.4
28-Oct-05	21	8:00	6	22.5	22.4	22.5	22.4	22.3	22.4	22.0	22.4	22.3	22.4	22.2	22.1	22.2	22.3	22.3
28-Oct-05	21	14:30	4	22.4	22.4	22.4	22.5	22.4	22.3	22.3	22.1	22.4	22.2	22.1	22.4	22.2	22.2	22.2
28-Oct-05	21	14:30	8	22.4	22.3	22.4	22.5	22.3	22.1	22.2	22.6	22.3	22.3	22.2	22.2	22.2	22.4	22.1
29-Oct-05	22	8:30	4	22.9	22.9	23.0	22.9	22.6	22.7	22.6	22.8	22.9	22.7	22.7	22.8	22.6	22.8	22.7
29-Oct-05	22	8:30	5	23.0	23.0	23.0	22.9	22.8	22.7	22.6	22.8	22.7	22.8	22.5	22.6	22.6	22.6	22.8
29-Oct-05	22	17:00	2	22.5	22.6	22.6	22.6	22.4	22.3	22.1	22.5	22.5	22.4	22.4	22.6	22.4	22.5	22.3
29-Oct-05	22	17:00	4	22.6	22.6	22.6	22.5	22.4	22.3	22.2	22.6	22.6	22.4	22.4	22.5	22.4	22.5	22.5
30-Oct-05	23	7:00	4	22.3	22.4	22.4	22.4	22.3	22.2	22.3	22.5	22.5	22.3	22.3	22.5	22.4	22.4	22.5
30-Oct-05	23	7:00	7	22.3	22.4	22.4	22.5	22.3	22.1	22.3	22.4	22.5	22.3	22.2	22.5	22.5	22.4	22.6
30-Oct-05	23	18:00	3	22.5	22.4	22.7	22.5	22.4	22.2	22.5	22.6	22.5	22.4	22.5	22.5	22.4	22.5	22.5
30-Oct-05	23	18:00	4	22.5	22.6	22.6	22.5	22.5	22.4	22.5	22.6	22.6	22.5	22.4	22.5	22.4	22.6	22.6
31-Oct-05	24	7:00	1	22.4	22.4	22.5	22.5	22.3	22.1	22.2	22.5	22.5	22.3	22.3	22.2	22.4	22.3	22.3
31-Oct-05	24	7:00	4	22.4	22.4	22.6	22.6	22.3	22.2	22.3	22.6	22.5	22.4	22.2	22.3	22.4	22.4	22.5
31-Oct-05	24	15:30	4	22.4	22.4	22.4	22.3	22.2	22.3	22.2	22.6	22.6	22.5	22.2	22.4	22.5	22.4	22.6
31-Oct-05	24	15:30	6	22.4	22.4	22.4	22.2	22.3	22.3	22.1	22.7	22.6	22.6	22.3	22.6	22.4	22.5	22.6
1-Nov-05	25	8:30	4	22.2	22.2	22.4	22.2	21.8	21.7	21.9	22.1	22.2	22.0	21.5	22.0	22.0	22.0	22.3
1-Nov-05	25	8:30	6	22.1	22.3	22.3	22.2	22.0	21.7	21.9	22.2	22.1	22.0	21.8	22.2	22.0	22.0	22.3
1-Nov-05	25	16:20	4	22.5	22.4	22.5	22.5	22.4	22.2	22.3	22.4	22.6	22.3	22.2	22.3	22.3	22.3	22.2
1-Nov-05	25	16:20	8	22.5	22.5	22.6	22.5	22.3	22.2	22.1	22.6	22.4	22.3	22.3	22.4	22.4	22.3	22.3
2-Nov-05	26	8:15	4	22.3	20.1	22.2	20.0	22.0	22.0	22.0	20.0	22.1	22.0	22.0	21.9	20.0	20.0	21.7
2-Nov-05	26	8:15	5	22.3	20.1	22.3	20.1	22.1	22.1	22.1	20.0	22.0	22.2	22.0	22.0	20.0	20.0	22.0
2-Nov-05	26	15:00	2	22.6	22.5	22.7	22.3	22.6	22.4	22.3	22.5	22.3	22.4	22.4	22.6	22.6	22.4	22.5
2-Nov-05	26	15:00	4	22.6	22.3	22.7	22.4	22.6	22.4	22.5	22.5	22.5	22.4	22.5	22.6	22.6	22.4	22.5
3-Nov-05	27	8:15	4	22.3	22.8	22.3	22.7	22.2	22.1	22.1	23.0	22.3	22.3	22.1	22.0	22.7	22.5	22.0
3-Nov-05	27	8:15	7	22.2	22.8	22.2	22.7	22.2	22.0	22.1	22.9	22.3	22.3	22.1	22.2	22.5	22.6	21.3
3-Nov-05	27	15:00	3	22.4	23.1	22.6	23.1	22.4	22.3	22.2	23.2	22.4	22.4	22.2	22.4	23.0	23.0	22.5
3-Nov-05	27	15:00	4	22.5	23.1	22.6	23.1	22.4	22.3	22.3	23.2	22.6	22.4	22.3	22.6	22.9	22.9	22.5
4-Nov-05	28	7:10	1	22.1	22.4	22.0	22.4	22.1	21.8	21.8	22.6	22.0	22.1	21.9	22.0	22.6	22.7	22.2
4-Nov-05	28	7:10	2	22.3	22.7	22.6	22.6	22.0	21.9	21.8	22.7	22.0	22.2	22.0	33.1	22.6	22.7	22.2
4-Nov-05	28	7:10	3	22.1	22.7	22.0	22.4	22.0	21.9	22.8	22.7	22.0	22.0	22.0	22.1	22.7	22.7	22.1
4-Nov-05	28	7:10	4	22.1	22.7	22.2	22.6	22.0	21.9	21.9	22.7	22.1	22.1	22.0	22.0	22.6	22.8	22.1
4-Nov-05	28	7:10	5	22.2	22.5	22.1	22.6	22.0	21.9	21.9	22.7	22.0	22.1	22.0	22.0	22.6	22.6	22.2
4-Nov-05	28	7:10	6	22.2	22.6	22.0	22.6	22.0	21.9	21.9	22.8	22.0	22.1	22.0	22.1	22.6	22.6	22.1
4-Nov-05	28	7:10	7	22.2	22.5	22.1	22.6	21.9	21.8	21.9	22.8	22.1	22.2	22.0	22.1	22.6	22.6	21.9
4-Nov-05	28	7:10	8	22.1	22.5	22.1	22.7	21.9	21.8	21.9	22.8	22.0	22.2	22.0	22.1	22.6	22.6	22.0
			Average	**22.5**	**22.5**	**22.6**	**22.5**	**22.4**	**22.3**	**22.4**	**22.5**	**22.5**	**22.4**	**22.4**	**22.6**	**22.4**	**22.5**	**22.4**
			Minimum	22.0	20.1	22.0	20.0	21.8	21.7	21.8	20.0	22.0	22.0	21.5	21.9	20.0	20.0	21.3
			Maximum	23.2	23.4	23.4	23.5	23.3	23.2	23.3	23.4	23.3	23.3	23.3	33.1	23.2	23.3	23.1

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	1	7.1	7.0	7.0	3.3	5.9	3.2	6.1	5.3	3.6	4.7	6.0	5.7	4.4	6.6	5.0
7-Oct-05	0	7:00	2	6.9	7.0	6.9	2.5	5.0	4.9	5.1	6.9	6.3	6.6	2.8	4.2	3.1	4.6	4.8
7-Oct-05	0	7:00	3	7.2	7.0	6.8	7.2	5.8	5.1	7.0	7.1	3.6	4.9	4.5	6.0	3.5	5.4	5.1
7-Oct-05	0	7:00	4	7.1	7.3	5.6	5.2	7.5	5.4	4.6	5.0	3.4	4.6	6.2	4.7	3.1	4.0	6.5
7-Oct-05	0	7:00	5	7.1	7.1	5.7	3.3	7.1	6.9	6.6	4.7	4.6	4.0	4.6	5.9	5.8	2.6	4.6
7-Oct-05	0	7:00	6	7.4	6.6	5.0	7.1	4.7	4.1	5.6	4.4	3.9	2.7	6.4	4.7	3.4	3.9	7.2
7-Oct-05	0	7:00	7	7.2	7.1	6.6	3.2	5.4	6.3		4.7	6.0	4.9	7.1	5.1	6.0	4.0	5.9
7-Oct-05	0	7:00	8	7.2	6.8	6.6	6.8	5.1	5.5	5.2	4.8	4.9	4.4	7.1	5.5	4.0	4.6	5.4
7-Oct-05	0	15:30	1	7.5	6.9	6.8	6.7	5.3	3.5	7.8	7.7	4.0	6.2	7.9	6.5	7.0	7.1	5.4
7-Oct-05	0	15:30	4	7.5	7.1	7.4	7.0	4.1	7.2	3.8	7.8	4.7	7.4	7.8	6.5	4.7	7.1	7.1
8-Oct-05	1	9:30	4	7.6	7.6	8.4	7.5	5.4	8.0	4.6	8.2	6.7	7.1	7.7	8.4	6.3	6.9	8.0
8-Oct-05	1	9:30	6	8.0	6.7	7.0	7.6	4.8	8.2	5.3	7.8	6.4	7.1	7.5	7.3	5.2	6.6	8.0
8-Oct-05	1	16:15	4	7.1	7.5	8.3	7.7	5.2	7.2	4.0	7.4	7.0	7.4	8.1	8.2	8.1	4.8	6.7
8-Oct-05	1	16:15	8	7.3	6.9	6.2	7.6	5.3	7.1	3.9	6.6	6.9	7.5	8.1	8.1	7.3	2.4	6.8
9-Oct-05	2	9:30	4	6.9	6.8	6.9	5.7	6.1	7.0	6.3	7.1	4.8	6.3	7.6	6.9	5.9	5.4	6.9
9-Oct-05	2	9:30	5	6.7	7.4	6.3	6.6	5.9	6.9	6.9	6.4	5.6	7.0	7.4	7.0	6.1	6.2	7.6
9-Oct-05	2	17:30	2	6.3	5.6	6.6	5.9	6.6	6.7	6.6	6.4	5.9	5.3	5.0	5.7	4.9	5.9	5.9
9-Oct-05	2	17:30	4	7.2	7.2	7.1	5.9	6.4	7.0	6.1	7.4	4.0	6.6	7.1	7.3	6.3	6.2	6.8
10-Oct-05	3	9:00	4	7.6	6.8	7.0	6.9	6.0	7.0	6.1	7.2	4.7	6.7	7.0	6.2	6.3	6.1	6.6
10-Oct-05	3	9:00	7	7.7	6.3	7.1	6.3	6.2	6.3	6.0	6.6	5.6	5.2	6.1	5.6	6.6	6.7	7.0
10-Oct-05	3	15:30	3	7.0	6.4	7.0	7.4	5.6	7.1	7.0	6.9	6.0	6.9	6.8	6.7	6.6	5.4	6.2
10-Oct-05	3	15:30	4	7.1	7.0	6.9	7.1	5.0	7.0	6.9	6.8	6.4	7.3	6.7	5.8	6.8	4.8	6.8
11-Oct-05	4	8:40	1	7.7	6.5	7.3	7.4	4.6	7.3	6.5	7.3	6.1	7.9	7.3	7.7	7.0	7.3	8.3
11-Oct-05	4	8:40	4	7.9	7.8	7.9	8.0	4.3	7.8	6.2	7.8	6.7	8.2	8.0	6.4	7.1	6.5	7.6
11-Oct-05	4	15:00	3	7.4	7.1	7.4	8.0	6.2	7.9	7.9	7.3	6.9	6.9	7.4	7.0	6.6	7.4	7.0
11-Oct-05	4	15:00	4	7.1	6.6	7.7	7.8	6.9	7.8	7.6	7.3	5.8	7.8	7.7	6.9	7.3	7.1	7.8
12-Oct-05	5	9:30	4	7.2	5.8	7.8	7.8	4.1	7.7	6.4	7.6	6.1	7.9	7.4	7.2	6.2	7.7	7.9
12-Oct-05	5	9:30	6	7.4	5.7	6.8	6.2	6.1	5.8	7.5	7.8	6.4	6.9	7.4	7.3	7.3	7.1	7.9
12-Oct-05	5	15:45	4	6.7	5.4	7.3	7.8	6.5	7.5	7.3	6.0	7.2	7.9	7.5	6.2	5.5	7.4	7.2
12-Oct-05	5	15:45	8	6.8	5.8	6.8	4.6	6.9	7.3	3.4	7.4	7.3	7.0	7.0	6.3	7.4	5.8	7.4
13-Oct-05	6	8:40	4	7.5	7.0	7.9	8.4	7.4	7.8	6.5	7.3	7.8	7.6	7.2	7.0	7.2	6.5	7.9
13-Oct-05	6	8:40	5	7.6	7.5	7.8	5.2	5.7	7.4	5.7	7.6	7.6	7.0	7.1	4.2	7.5	4.1	6.5
13-Oct-05	6	15:20	2	6.4	3.4	7.2	5.4	6.6	7.4	5.6	5.9	7.2	7.3	7.4	6.8	6.8	5.6	6.5
13-Oct-05	6	15:20	4	7.2	4.7	7.6	7.5	7.4	7.1	6.9	6.3	6.6	7.0	6.4	5.3	6.9	6.5	7.2
14-Oct-05	7	8:15	4	7.9	6.8	7.5	8.6	7.5	8.1	8.3	8.3	5.7	7.2	7.6	7.2	7.1	7.8	6.6
14-Oct-05	7	8:15	7	7.3	6.3	7.1	7.4	7.1	8.4	7.2	8.0	7.2	7.3	7.5	7.4	7.7	7.3	6.9
14-Oct-05	7	15:15	3	7.0	7.3	7.2	7.7	5.7	7.4	6.9	7.0	6.1	8.0	7.3	7.0	6.6	8.0	7.3
14-Oct-05	7	15:15	4	6.8	6.9	7.6	7.7	7.1	7.5	7.4	7.5	4.0	7.6	6.9	7.4	7.2	7.4	7.7
15-Oct-05	8	8:15	4	7.3	6.5	7.3	8.0	8.3	7.6	6.8	7.4	4.9	7.1	6.8	6.8	6.3	7.8	7.6
15-Oct-05	8	8:15	6	7.4	4.3	6.2	5.2	8.3	7.7	3.4	7.5	5.7	7.3	7.0	7.0	6.5	7.8	7.7
15-Oct-05	8	15:30	4	6.6	5.9	8.3	8.1	8.5	7.8	7.7	7.4	5.1	8.0	7.2	6.6	6.9	7.7	8.0
15-Oct-05	8	15:30	8	6.6	6.2	7.0	6.9	8.2	7.6	4.7	7.1	6.1	8.1	6.5	5.5	7.1	6.0	6.8
16-Oct-05	9	9:30	4	7.6	7.4	7.9	7.6	7.5	7.9	8.4	8.6	5.1	8.5	7.5	8.8	5.8	7.6	8.7
16-Oct-05	9	9:30	7	7.4	7.7	8.1	7.4	7.2	8.1	6.1	7.8	7.2	8.3	7.8	8.9	7.1	6.7	7.8
16-Oct-05	9	17:30	1	7.1	7.2	8.6	8.8	8.6	6.1	6.4	8.5	7.1	7.7	8.2	7.1	7.5	7.2	7.2
16-Oct-05	9	17:30	4	7.2	8.6	8.3	8.6	7.6	5.9	8.4	8.4	4.9	7.9	7.0	7.3	6.1	7.6	7.4
17-Oct-05	10	8:00	4	7.0	6.1	8.3	7.1	6.5	7.6	6.3	6.7	4.5	7.4	7.2	7.2	6.3	7.1	7.6
17-Oct-05	10	8:00	5	7.1	7.1	7.5	6.2	6.5	6.6	5.7	6.9	7.1	6.7	6.8	6.1	5.1	5.5	5.4
17-Oct-05	10	15:50	2	7.4	6.6	7.2	6.8	4.5	6.9	6.7	7.2	6.7	6.4	6.8	5.2	5.3	53.9	6.1
17-Oct-05	10	15:50	4	7.3	6.6	7.3	7.7	4.4	7.2	6.1	6.8	6.7	7.1	6.4	5.5	6.8	6.5	7.5
18-Oct-05	11	8:30	4	7.4	7.3	6.8	7.8	6.9	7.3	7.3	7.0	7.7	6.3	6.3	6.3	5.9	5.9	7.2
18-Oct-05	11	8:30	7	7.0	6.9	7.2	6.1	7.3	7.7	7.9	7.9	7.4	6.8	7.0	6.2	6.9	5.5	7.2
18-Oct-05	11	15:20	3	7.6	7.5	7.0	7.7	6.9	7.3	6.6	7.5	5.0	5.7	7.2	7.4	7.0	6.8	6.8
18-Oct-05	11	15:20	4	7.4	5.7	7.8	7.7	6.8	7.3	7.2	7.9	7.8	6.4	7.0	5.9	7.0	6.1	7.5

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
19-Oct-05	12	8:15	1	7.4	7.4	7.0	8.0	8.0	6.4	6.1	8.4	5.4	7.9	8.8	7.3	8.3	6.4	7.9
19-Oct-05	12	8:15	4	7.3	7.0	7.3	8.5	8.6	7.5	6.6	8.3	7.3	7.8	8.6	7.0	7.3	7.1	8.0
19-Oct-05	12	15:20	4	8.2	6.9	8.1	7.6	7.3	7.8	7.3	7.5	6.8	6.5	7.0	6.7	7.6	7.3	7.4
19-Oct-05	12	15:20	5	8.0	8.0	7.9	6.2	6.3	5.7	7.4	6.9	6.4	7.5	7.7	5.8	7.1	5.0	7.3
20-Oct-05	13	8:15	4	7.3	6.5	7.0	6.9	7.3	7.4	6.5	7.1	7.3	7.1	8.3	7.7	7.3	8.0	7.4
20-Oct-05	13	8:15	6	7.6	5.2	7.2	6.9	8.3	6.8	6.5	8.3	4.7	7.6	7.5	8.2	7.6	6.9	7.0
20-Oct-05	13	15:25	4	7.1	7.2	7.6	7.2	6.9	6.9	6.9	7.2	7.6	5.8	7.2	6.4	7.3	6.8	7.4
20-Oct-05	13	15:25	8	6.8	7.3	7.5	5.8	6.1	7.1	6.3	6.8	6.9	7.4	7.0	7.5	7.0	7.3	7.1
21-Oct-05	14	8:15	4	7.5	7.8	8.4	8.6	7.4	8.0	6.9	6.1	8.1	6.7	6.2	6.9	6.8	8.3	7.4
21-Oct-05	14	8:15	5	7.4	7.7	8.0	7.9	7.2	7.1	7.6	5.9	8.2	7.6	6.5	6.9	7.2	7.8	7.2
21-Oct-05	14	15:15	2	7.5	7.1	7.3	7.4	6.6	7.2	4.6	6.3	8.4	5.2	7.0	6.4	7.8	7.7	6.7
21-Oct-05	14	15:15	4	7.2	7.0	7.3	7.6	6.2	7.4	5.1	6.7	7.7	5.1	7.2	6.9	8.1	8.0	7.2
22-Oct-05	15	9:00	4	7.7	7.3	7.3	7.5	6.8	6.9	6.4	7.3	8.1	5.7	7.0	6.6	7.4	7.4	7.3
22-Oct-05	15	9:00	7	7.8	7.1	7.4	7.6	6.7	7.8	5.3	7.6	6.6	7.7	8.2	6.9	7.5	6.9	7.0
22-Oct-05	15	18:00	3	7.6	7.7	7.3	7.5	7.3	7.0	6.2	7.2	7.7	6.0	8.0	7.1	8.3	7.5	7.9
22-Oct-05	15	18:00	4	7.3	7.4	7.3	7.1	7.6	7.8	5.7	7.3	7.0	4.9	5.5	7.6	7.8	7.8	8.0
23-Oct-05	16	9:00	1	7.9	7.9	7.1	7.1	6.9	6.4	7.0	7.8	6.5	6.4	7.5	7.8	7.0	6.9	7.8
23-Oct-05	16	9:00	4	7.7	7.5	7.3	7.8	7.0	7.9	7.1	8.5	7.0	6.8	6.4	7.7	7.3	7.0	8.4
24-Oct-05	17	8:00	4	7.8	8.7	7.2	7.6	6.6	7.2	6.3	7.6	8.1	6.1	7.4	7.2	7.3	8.5	8.9
24-Oct-05	17	8:00	6	8.1	7.4	7.3	5.9	6.7	5.9	6.2	7.1	6.2	7.7	7.6	7.8	7.1	6.9	8.4
24-Oct-05	17	16:25	4	7.6	7.0	7.1	6.7	6.4	7.0	6.9	7.0	6.9	4.8	7.1	6.9	7.2	6.7	7.0
24-Oct-05	17	16:25	8	7.5	8.2	6.9	6.4	6.8	7.1	5.7	6.1	5.5	7.3	7.2	7.2	7.0	6.4	7.0
25-Oct-05	18	6:00	4	7.4	7.4	7.0	6.9	6.6	7.4	6.4	7.2	7.4	5.4	6.4	7.2	7.4	6.9	4.2
25-Oct-05	18	6:00	5	7.6	7.8	7.9	7.6	7.0	6.8	6.9	6.0	7.3	6.8	7.1	6.6	6.7	7.2	7.3
25-Oct-05	18	15:00	2	7.8	6.9	7.4	7.3	6.9	6.8	6.9	6.7	7.6	6.1	7.1	6.7	7.9	8.1	6.6
25-Oct-05	18	15:00	4	8.0	7.6	7.8	7.1	6.7	7.6	6.6	7.8	7.0	6.6	6.4	7.4	7.6	7.1	5.9
26-Oct-05	19	8:00	4	8.3	8.5	7.7	8.3	7.1	7.8	6.2	7.4	8.2	7.4	7.9	8.4	7.3	8.5	9.0
26-Oct-05	19	8:00	7	8.6	8.2	7.7	7.8	7.1	7.6	6.9	6.9	8.1	6.9	8.2	8.3	6.9	7.0	8.4
26-Oct-05	19	15:30	3	8.6	8.8	8.0	7.7	7.6	7.4	8.2	8.4	6.8	6.3	7.8	7.2	7.2	7.5	6.8
26-Oct-05	19	15:30	4	8.0	7.6	8.0	7.6	6.7	7.5	7.1	7.7	7.1	6.1	7.0	6.9	7.3	7.3	6.8
27-Oct-05	20	8:00	1	8.3	8.1	7.6	7.3	8.1	7.0	7.4	7.9	6.6	6.3	7.6	7.1	7.4	7.1	7.7
27-Oct-05	20	8:00	4	8.0	7.8	7.7	7.9	6.9	7.1	7.0	7.4	6.9	5.6	7.6	6.9	7.6	7.8	8.0
27-Oct-05	20	15:00	2	8.3	8.4	7.7	7.6	7.8	7.6	7.0	7.8	6.8	6.2	7.9	7.3	7.6	7.4	8.3
27-Oct-05	20	15:00	4	8.2	8.0	8.0	8.2	7.0	7.4	7.4	7.8	7.0	6.0	7.4	7.0	7.8	7.5	8.1
28-Oct-05	21	8:00	4	8.2	8.6	7.9	8.1	7.9	7.8	7.7	8.2	8.0	7.2	7.9	7.4	7.2	7.9	7.0
28-Oct-05	21	8:00	6	8.8	6.8	7.8	6.2	7.9	7.6	5.6	8.1	7.4	7.9	7.8	7.6	7.4	6.9	6.9
28-Oct-05	21	14:30	4	9.3	8.3	8.4	7.7	7.1	8.0	8.1	7.3	8.4	7.1	7.9	8.0	7.8	7.8	6.3
28-Oct-05	21	14:30	8	8.9	9.1	8.3	7.7	7.1	7.7	7.2	8.3	6.6	8.2	8.4	8.1	7.3	7.8	7.2
29-Oct-05	22	8:30	4	8.9	8.1	8.4	8.3	7.4	7.2	7.1	7.4	7.9	7.4	7.1	6.8	7.3	7.5	7.6
29-Oct-05	22	8:30	5	8.6	6.7	8.0	7.8	7.2	5.7	7.5	8.1	7.5	7.9	7.4	7.2	6.4	6.6	7.1
29-Oct-05	22	17:00	2	8.7	7.2	7.5	7.3	6.4	7.3	6.8	7.0	7.4	7.4	7.9	7.1	7.1	8.0	8.5
29-Oct-05	22	17:00	4	8.1	7.6	7.9	8.0	6.8	7.4	8.3	7.3	7.6	6.9	7.4	7.4	7.3	8.3	8.2
30-Oct-05	23	7:00	4	8.0	7.6	8.2	7.3	7.3	7.9	7.4	8.1	7.7	7.3	8.1	7.0	7.0	8.0	7.2
30-Oct-05	23	7:00	7	8.5	6.5	7.9	7.9	7.3	7.2	7.0	7.7	7.8	7.6	8.0	7.8	8.2	5.6	6.9
30-Oct-05	23	18:00	3	8.3	8.6	7.4	8.3	7.2	7.9	6.9	7.9	6.6	9.0	8.5	7.0	8.0	7.7	8.2
30-Oct-05	23	18:00	4	8.3	7.2	7.7	7.9	6.6	8.2	7.3	8.2	8.4	7.7	8.6	7.6	7.3	8.0	8.5
31-Oct-05	24	6:00	1	8.7	8.2	7.2	7.1	7.7	7.5	6.7	7.5	6.6	8.6	7.4	8.1	7.8	8.3	8.2
31-Oct-05	24	6:00	4	8.2	7.5	7.4	7.2	6.8	7.7	6.9	6.7	7.0	7.8	7.6	7.3	7.6	8.3	8.0
31-Oct-05	24	15:30	4	8.6	6.9	8.3	8.1	7.6	7.3	7.9	7.0	6.7	6.4	7.2	7.1	7.1	7.8	6.8
31-Oct-05	24	15:30	6	8.5	8.7	8.1	8.2	7.8	4.9	7.0	7.0	6.4	6.8	6.7	7.3	6.6	5.5	6.9
1-Nov-05	25	8:30	4	7.9	7.2	7.1	7.4	7.4	7.2	6.9	7.2	7.0	6.4	8.5	7.3	6.9	8.3	7.3
1-Nov-05	25	8:30	6	8.0	6.6	7.5	7.4	6.5	6.2	6.4	7.9	6.1	6.8	7.2	7.5	6.8	6.2	6.9
1-Nov-05	25	16:20	4	7.9	6.0	7.6	7.1	6.8	6.9	7.5	7.5	7.9	7.7	6.8	6.9	7.0	7.1	7.8
1-Nov-05	25	16:20	8	8.0	8.3	7.6	7.5	7.3	7.6	7.7	8.1	6.7	8.1	7.3	6.7	6.5	6.5	7.1
2-Nov-05	26	8:15	4	8.0	4.3	8.1	8.2	6.9	7.1	7.5	8.1	7.6	6.3	7.7	8.8	8.9	8.5	8.5
2-Nov-05	26	8:15	5	7.9	6.7	8.0	7.6	4.3	7.4	7.3	7.3	7.1	7.1	8.1	7.7	7.6	7.5	8.6
2-Nov-05	26	15:00	2	7.8	7.7	7.8	6.8	7.3	7.3	5.5	6.8	7.3	8.0	6.1	7.2	7.7	7.5	5.0
2-Nov-05	26	15:00	4	7.5	4.2	7.4	7.2	7.3	7.3	7.5	6.9	7.4	6.0	7.2	7.4	7.1	7.7	6.0
3-Nov-05	27	8:15	4	7.4	6.1	7.3	7.2	6.1	6.7	7.5	7.2	7.0	7.1	6.9	7.6	7.6	8.4	8.0
3-Nov-05	27	8:15	7	7.6	5.9	7.5	7.2	6.6	6.8	6.9	6.7	6.5	7.4	6.7	7.2	7.3	5.6	7.7
3-Nov-05	27	15:00	3	8.1	7.6	7.1	7.0	6.6	7.1	5.2	7.1	5.9	7.1	6.0	7.3	6.9	7.4	6.7

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
3-Nov-05	27	15:00	4	7.9	4.9	7.2	7.5	6.1	7.0	5.8	6.6	7.3	6.3	5.7	6.8	6.7	7.9	6.9
4-Nov-05	28	7:10	1	6.6	7.1	6.5	7.8	6.8	7.2	7.6	7.1	6.6	8.1	7.1	7.1	7.0	7.3	7.6
4-Nov-05	28	7:10	2	7.8	6.4	6.7	7.5	6.4	6.5	7.8	6.8	7.0	7.0	7.0	7.5	7.6	7.5	7.3
4-Nov-05	28	7:10	3	7.7	7.1	7.9	7.8	7.2	7.1	7.5	7.0	7.4	6.8	7.2	7.8	7.8	7.7	7.4
4-Nov-05	28	7:10	4	7.4	5.3	7.4	7.1	5.6	7.4	8.0	7.5	7.8	7.1	6.9	7.7	7.2	7.0	7.7
4-Nov-05	28	7:10	5	7.5	6.6	7.1	7.8	5.1	6.7	7.1	7.5	7.6	7.3	7.0	7.7	7.2	6.0	7.5
4-Nov-05	28	7:10	6	7.4	6.8	7.2	7.0	7.2	6.0	6.8	7.0	7.1	7.4	7.4	7.8	6.9	6.3	7.2
4-Nov-05	28	7:10	7	7.5	5.6	7.6	7.5	5.8	7.6	7.5	7.4	7.8	7.7	7.9	7.8	7.2	7.2	7.3
4-Nov-05	28	7:10	8	7.3	6.0	7.4	6.8	6.1	7.1	7.8	7.7	6.5	7.7	7.5	7.6	7.3	7.0	7.1
			Average	**7.6**	**7.0**	**7.4**	**7.2**	**6.6**	**7.1**	**6.6**	**7.2**	**6.6**	**6.9**	**7.2**	**7.0**	**6.9**	**7.2**	**7.2**
			Minimum	6.3	3.4	5.0	2.5	4.1	3.2	3.4	4.4	3.4	2.7	2.8	4.2	3.1	2.4	4.2
			Maximum	9.3	9.1	8.6	8.8	8.6	8.4	8.4	8.6	8.4	9.0	8.8	8.9	8.9	53.9	9.0

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.

pH

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	1	8.10	7.44	7.90	7.10	7.51	7.00	7.84	7.66	6.92	7.68	7.54	7.36	7.26	7.80	7.18
7-Oct-05	0	7:00	4	8.13	7.69	7.74	7.13	7.43	7.63	6.93	7.33	7.22	7.45	7.66	7.21	6.92	7.14	7.17
7-Oct-05	0	7:00	5	8.15	7.55	7.27	6.87	7.70	7.72	7.83	7.36	7.17	7.34	7.45	7.26	7.31	7.00	7.49
7-Oct-05	0	7:00	8	8.15	7.53	7.47	7.71	7.79	7.04	7.56	7.35	7.35	7.43	7.91	7.46	7.05	7.18	7.24
10-Oct-05	3	9:00	4	8.67	7.60	8.00	8.01	7.96	7.87	8.01	8.04	7.48	7.84	7.84	7.87	7.74	7.60	7.89
10-Oct-05	3	9:00	7	8.62	7.57	8.01	8.00	8.02	7.90	7.85	8.03	7.88	7.88	7.94	7.80	7.73	7.80	7.57
13-Oct-05	6	8:40	4	8.12	7.74	8.01	8.04	7.94	7.84	7.76	7.71	7.99	8.05	7.90	7.77	7.77	7.90	7.78
13-Oct-05	6	8:40	5	8.13	8.01	8.01	7.35	7.40	7.93	7.70	7.79	7.95	7.99	8.01	7.38	7.89	7.47	7.81
15-Oct-05	8	8:15	4	8.18	7.69	8.06	8.11	8.10	7.99	7.95	8.03	7.52	8.05	7.64	7.80	7.55	7.95	7.69
15-Oct-05	8	8:15	6	8.20	7.80	7.56	7.51	8.11	7.96	7.43	8.10	7.75	8.08	7.94	8.01	7.69	7.84	8.05
17-Oct-05	10	8:00	4	8.48	7.56	8.05	8.02	7.96	7.82	7.85	8.05	7.41	8.04	7.68	7.79	7.84	7.89	7.90
17-Oct-05	10	8:00	5	8.10	8.02	8.05	7.80	7.72	7.91	7.90	8.02	7.88	7.98	7.81	7.66	7.47	7.65	7.49
20-Oct-05	13	8:15	4	8.16	7.89	8.02	8.04	7.92	7.94	7.86	7.88	7.38	7.91	7.88	7.78	7.93	8.04	7.81
20-Oct-05	13	8:15	6	8.16	7.60	8.03	7.80	7.97	7.62	7.89	8.06	8.00	7.86	7.16	7.91	7.97	7.79	7.96
22-Oct-05	15	9:00	4	8.20	8.19	8.10	7.92	7.89	7.80	7.76	8.05	7.84	7.45	7.83	7.82	8.05	8.12	7.74
22-Oct-05	15	9:00	7	8.20	7.85	8.10	7.69	7.86	7.86	7.59	8.08	7.80	8.03	7.91	7.79	8.04	7.95	7.95
24-Oct-05	17	8:00	4	8.18	8.34	8.05	7.98	7.86	7.90	7.75	7.95	8.00	7.52	7.74	7.80	7.98	8.05	7.80
24-Oct-05	17	8:00	6	8.30	7.84	8.04	7.88	7.88	7.33	7.57	8.05	7.54	7.96	7.81	7.95	7.79	7.83	7.78
27-Oct-05	20	8:00	1	8.00	7.99	7.90	7.69	7.82	7.76	7.70	7.69	7.75	7.94	7.65	7.75	7.98	7.96	7.88
27-Oct-05	20	8:00	4	8.01	8.18	7.87	7.75	7.84	7.81	7.80	7.79	7.71	7.58	7.75	7.80	7.58	8.02	7.90
29-Oct-05	22	8:30	4	8.40	8.00	8.05	7.92	7.89	7.68	7.90	7.96	7.89	7.90	7.64	7.77	7.90	7.97	7.84
29-Oct-05	22	8:30	5	8.36	7.69	8.04	7.73	7.77	7.23	7.95	8.02	7.68	8.04	7.77	7.95	7.47	7.61	7.21
31-Oct-05	24	8:00	1	8.58	8.44	8.13	8.00	7.95	7.74	7.95	8.07	7.76	8.17	8.01	7.82	8.01	8.07	8.01
31-Oct-05	24	8:00	4	8.49	8.13	8.15	8.02	7.68	7.81	8.02	8.07	7.91	8.07	7.92	7.79	7.88	8.16	8.00
4-Nov-05	28	7:10	1	8.29	7.90	8.05	8.00	8.02	7.75	7.85	8.09	7.70	8.11	7.88	7.91	8.04	8.18	7.20
4-Nov-05	28	7:10	4	8.23	7.38	8.10	8.06	7.79	7.76	8.05	8.09	7.95	7.94	7.71	7.98	8.04	8.21	7.84
4-Nov-05	28	7:10	5	8.20	7.63	8.11	8.01	7.45	7.58	8.09	8.12	7.75	8.08	7.75	8.03	7.86	7.87	7.95
4-Nov-05	28	7:10	8	8.09	7.61	8.13	8.01	7.79	7.65	8.03	8.12	7.52	8.10	7.78	8.04	7.84	7.91	7.78
			Average	**8.25**	**7.82**	**7.96**	**7.79**	**7.82**	**7.71**	**7.80**	**7.91**	**7.67**	**7.87**	**7.77**	**7.76**	**7.74**	**7.82**	**7.71**
			Minimum	8.00	7.38	7.27	6.87	7.40	7.00	6.93	7.33	6.92	7.34	7.16	7.21	6.92	7.00	7.17
			Maximum	8.67	8.44	8.15	8.11	8.11	7.99	8.09	8.12	8.00	8.17	8.01	8.04	8.05	8.21	8.05

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	1	125	133	123	137	130	120	125	128	123	126	127	126	122	122	120
7-Oct-05	0	7:00	8	123	134	133	123	124	115	127	124	123	124	125	125	121	120	120
13-Oct-05	6	8:40	4	137	157	132	142	132	134	146	142	138	139	140	142	135	141	137
13-Oct-05	6	8:40	5	139	155	140	146	133	133	150	147	137	139	139	144	139	145	139
20-Oct-05	13	8:15	4	132	153	133	133	136	129	137	135	133	133	138	137	136	137	129
20-Oct-05	13	8:15	6	132	159	133	134	137	129	140	137	136	134	136	139	136	130	129
27-Oct-05	20	8:00	1	135	159	134	128	137	125	138	138	129	134	134	136	134	135	129
27-Oct-05	20	8:00	4	134	151	136	127	137	124	138	138	130	134	134	135	133	135	130
4-Nov-05	28	7:10	1	133	149	130	133	135	124	140	138	129	133	131	138	132	136	130
4-Nov-05	28	7:10	8	138	148	130	133	137	124	135	137	126	133	131	135	132	135	130
			Average	**133**	**150**	**132**	**134**	**134**	**126**	**138**	**136**	**130**	**133**	**133**	**136**	**132**	**134**	**129**
			Minimum	123	133	123	123	124	115	125	124	123	124	125	125	121	120	120
			Maximum	139	159	140	146	137	134	150	147	138	139	140	144	139	145	139

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.
Ammonia (ppm)

Date	Day	Time	Rep	Silica Sand	orm. Sedime	W. Bearskir	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	1	0.066	0.067	0.194	0.075	0.481	<0.063	0.321	0.269	<0.063	0.304	0.123	0.090	0.145	<0.063	<0.063
7-Oct-05	0	7:00	8	<0.063	0.069	0.396	0.547	0.505	<0.063	0.323	0.454	<0.063	0.458	0.089	<0.063	0.131	0.130	<0.063
4-Nov-05	28	7:10	1	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
4-Nov-05	28	7:10	8	<0.063	0.065	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
			Average	**<0.063**	**<0.063**	**0.163**	**0.165**	**0.263**	**<0.063**	**0.177**	**0.218**	**<0.063**	**0.207**	**0.069**	**<0.063**	**0.085**	**<0.063**	**<0.063**
			Minimum	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
			Maximum	0.066	0.069	0.396	0.547	0.505	<0.063	0.323	0.454	<0.063	0.458	0.123	0.090	0.145	0.130	<0.063

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.
DOC (ppm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	1	2.1	4.3	2.0	3.2	3.2	13.3	4.1	2.6	14.3	4.2	6.7	3.6	5.0	8.7	9.2
7-Oct-05	0	7:00	8	1.9	3.8	2.4	14.8	3.6	10.4	3.9	2.3	9.5	2.3	5.0	3.4	7.1	6.0	7.9
4-Nov-05	28	7:10	1	1.9	2.3	1.9	1.9	1.7	2.0	1.6	1.8	1.9	2.0	1.7	1.8	1.7	2.0	2.4
4-Nov-05	28	7:10	8	1.8	2.1	1.8	1.6	1.5	2.2	1.6	1.7	2.2		2.4	1.8	2.6	2.2	2.1
			Average	**1.9**	**3.1**	**2.0**	**5.4**	**2.5**	**7.0**	**2.8**	**2.1**	**7.0**	**2.8**	**4.0**	**2.7**	**4.1**	**4.7**	**5.4**
			Minimum	1.8	2.1	1.8	1.6	1.5	2.0	1.6	1.7	1.9	2.0	1.7	1.8	1.7	2.0	2.1
			Maximum	2.1	4.3	2.4	14.8	3.6	13.3	4.1	2.6	14.3	4.2	6.7	3.6	7.1	8.7	9.2

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.
Hardness (mg/L as $CaCO_3$)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	3	47.2	40.4	48.0	46.8	53.6	51.6	51.2	49.6		46.4	61.2	47.2			
7-Oct-05	0	7:00	7	47.2	42.0	52.8	59.6	50.0	52.0	50.8	55.2	59.6	48.8	47.6	53.6	50.4		
4-Nov-05	28	7:10	3	42.8	46.0	41.6	42.0	43.2	40.0	44.0	47.6	42.0	41.2	44.4	46.8	46.4	45.2	42.4
4-Nov-05	28	7:10	7	44.0	50.4	42.8	43.2	44.4	40.4	44.0	45.6	38.8	43.6	40.4	52.0	45.2	46.0	41.6
			Average	**45.3**	**44.7**	**46.3**	**47.9**	**47.8**	**46.0**	**47.5**	**49.5**	**46.8**	**45.0**	**48.4**	**49.9**	**47.3**	**45.6**	**42.0**
			Minimum	42.8	40.4	41.6	42.0	43.2	40.0	44.0	45.6	38.8	41.2	40.4	46.8	45.2	45.2	41.6
			Maximum	47.2	50.4	52.8	59.6	53.6	52.0	51.2	55.2	59.6	48.8	61.2	53.6	50.4	46.0	42.4

Missing data due to samples being too cloudy to be able to determine endpoint.

Appendix Table 9. Water Chemistry Parameters for *H. azteca* 28-d Test Exposed to Sediments from Ashland Harbor, 7 October 2005 to 4 November 2005.
Alkalinity (mg/L as $CaCO_3$)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
7-Oct-05	0	7:00	2	52.4	44.4	47.6	59.6	59.2	48.8	56.4	48.0	49.2	48.8	60.8	60.4	63.6	53.2	59.6
7-Oct-05	0	7:00	6	51.6	40.0	44.0	52.8	50.8	47.2	54.8	59.6	55.2	56.4	49.2	54.8	51.2	51.6	48.8
4-Nov-05	28	7:10	2	48.4	58.0	47.2	48.0	46.4	44.0	50.4	51.2	46.0	46.8	44.8	48.4	48.8	51.6	47.6
4-Nov-05	28	7:10	6	48.4	56.8	44.8	48.4	51.6	46.0	51.6	50.8	46.8	49.6	47.6	52.0	50.8	53.2	48.4
			Average	**50.2**	**49.8**	**45.9**	**52.2**	**52.0**	**46.5**	**53.3**	**52.4**	**49.3**	**50.4**	**50.6**	**53.9**	**53.6**	**52.4**	**51.1**
			Minimum	48.4	40.0	44.0	48.0	46.4	44.0	50.4	48.0	46.0	46.8	44.8	48.4	48.8	51.6	47.6
			Maximum	52.4	58.0	47.6	59.6	59.2	48.8	56.4	59.6	55.2	56.4	60.8	60.4	63.6	53.2	59.6

APPENDIX 10

Survival and Growth of *H. azteca* following 10-d Exposure to Ashland Harbor Sediment and a Dilution Series Under laboratory Lighting
1 January 2006 to 13 January 2006

Appendix Table 10. Survival and Growth of *H. azteca* following 10-d of Exposure to Ashland Harbor Sediment and a Dilution Series Under Laboratory Light,

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected % Mortality	Total Dry wt (mg)	Individual Dry wt (mg)	Average Dry wt (mg)	Standard Deviation
A	Silica Sand	1	10	100.0			1.2	0.12		
A	Silica Sand	2	10	100.0			1.3	0.13		
A	Silica Sand	3	10	100.0			1.4	0.14		
A	Silica Sand	4	10	100.0			1.2	0.12		
A	Silica Sand	5	10	100.0			1.5	0.15		
A	Silica Sand	6	10	100.0			1.8	0.18		
A	Silica Sand	7	10	100.0			1.5	0.15		
A	Silica Sand	8	10	100.0	0.0		1.7	0.17	0.15	0.02
B	W. Bearskin	1	10	100.0			0.9	0.09		
B	W. Bearskin	2	10	100.0			1.3	0.13		
B	W. Bearskin	3	10	100.0			1.1	0.11		
B	W. Bearskin	4	10	100.0			1.0	0.10		
B	W. Bearskin	5	10	100.0			1.1	0.11		
B	W. Bearskin	6	10	100.0			1.3	0.13		
B	W. Bearskin	7	10	100.0			1.2	0.12		
B	W. Bearskin	8	8	80.0	7.1		1.0	0.13	0.11	0.01
C	Dilution Sedimen	1	10	100.0			1.1	0.11		
C	Dilution Sedimen	2	12	120.0			1.2	0.10		
C	Dilution Sedimen	3	9	90.0			1.1	0.12		
C	Dilution Sedimen	4	10	100.0			0.9	0.09		
C	Dilution Sedimen	5	10	100.0			1.0	0.10		
C	Dilution Sedimen	6	10	100.0			1.3	0.13		
C	Dilution Sedimen	7	10	100.0			1.4	0.14		
C	Dilution Sedimen	8	10	100.0	8.3		1.1	0.11	0.11	0.02
D	SQT9	1	10	100.0			1.9	0.19		
D	SQT9	2	10	100.0			1.8	0.18		
D	SQT9	3	10	100.0			1.7	0.17		
D	SQT9	4	10	100.0			1.9	0.19		
D	SQT9	5	10	100.0			1.6	0.16		
D	SQT9	6	9	90.0			2.1	0.23		
D	SQT9	7	10	100.0			1.8	0.18		
D	SQT9	8	9	90.0	4.6		1.4	0.16	0.18	0.02
E	SQT11	1	10	100.0			1.1	0.11		
E	SQT11	2	10	100.0			1.3	0.13		
E	SQT11	3	10	100.0			1.3	0.13		
E	SQT11	4	9	90.0			1.3	0.14		
E	SQT11	5	8	80.0			1.0	0.13		
E	SQT11	6	10	100.0			1.2	0.12		
E	SQT11	7	9	90.0			1.2	0.13		
E	SQT11	8	9	90.0	7.4		1.1	0.12	0.13	0.01
F	12.5% SQT1	1	10	100.0		100.0	1.3	0.13		
F	12.5% SQT1	2	10	100.0		100.0	1.6	0.16		
F	12.5% SQT1	3	9	90.0		99.9	1.1	0.12		
F	12.5% SQT1	4	10	100.0		100.0	1.3	0.13		
F	12.5% SQT1	5	9	90.0		99.9	1.3	0.14		
F	12.5% SQT1	6	10	100.0		100.0	0.9	0.09		
F	12.5% SQT1	7	10	100.0		100.0	1.0	0.10		
F	12.5% SQT1	8	10	100.0	4.6	100.0	1.1	0.11	0.12	0.02
G	25% SQT1	1	10	100.0		100.0	0.9	0.09		
G	25% SQT1	2	8	80.0		99.8	0.9	0.11		
G	25% SQT1	3	10	100.0		100.0	1.0	0.10		
G	25% SQT1	4	10	100.0		100.0	1.0	0.10		
G	25% SQT1	5	8	80.0		99.8	0.8	0.10		
G	25% SQT1	6	10	100.0		100.0	1.0	0.10		
G	25% SQT1	7	0	0.0		99.0				
G	25% SQT1	8	10	100.0	34.5	100.0	1.1	0.11	0.10	0.01
H	50% SQT1	1	1	10.0		99.1	0.1	0.10		
H	50% SQT1	2	2	20.0		99.2	0.1	0.05		
H	50% SQT1	3	1	10.0		99.1	0.2	0.20		
H	50% SQT1	4	3	30.0		99.3	0.4	0.13		

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected % Mortality	Total Dry wt (mg)	Individual Dry wt (mg)	Average Dry wt (mg)	Standard Deviation
H	50% SQT1	5	1	10.0		99.1	0.2	0.20		
H	50% SQT1	6	3	30.0		99.3	0.4	0.13		
H	50% SQT1	7	1	10.0		99.1	0.0	0.00		
H	50% SQT1	8	0	0.0	10.7	99.0			0.12	0.07
I	100% SQT1	1	0	0.0		99.0				
I	100% SQT1	2	0	0.0		99.0				
I	100% SQT1	3	0	0.0		99.0				
I	100% SQT1	4	0	0.0		99.0				
I	100% SQT1	5	0	0.0		99.0				
I	100% SQT1	6	0	0.0		99.0				
I	100% SQT1	7	0	0.0		99.0				
I	100% SQT1	8	0	0.0	0.0	99.0				
J	SQT4	1	10	100.0		100.0	1.8	0.18		
J	SQT4	2	10	100.0		100.0	1.8	0.18		
J	SQT4	3	9	90.0		99.9	1.7	0.19		
J	SQT4	4	9	90.0		99.9	1.8	0.20		
J	SQT4	5	10	100.0		100.0	1.6	0.16		
J	SQT4	6	9	90.0		99.9	1.8	0.20		
J	SQT4	7	9	90.0		99.9	1.5	0.17		
J	SQT4	8	9	90.0	5.2	99.9	1.5	0.17	0.18	0.02
K	SQT2	1	10	100.0		100.0	1.0	0.10		
K	SQT2	2	9	90.0		99.9	1.4	0.16		
K	SQT2	3	9	90.0		99.9	1.4	0.16		
K	SQT2	4	10	100.0		100.0	1.1	0.11		
K	SQT2	5	9	90.0		99.9	1.4	0.16		
K	SQT2	6	10	100.0		100.0	1.2	0.12		
K	SQT2	7	9	90.0		99.9	1.1	0.12		
K	SQT2	8	8	80.0	7.1	99.8	1.2	0.15	0.13	0.02
L	SQT5	1	10	100.0		100.0	1.6	0.16		
L	SQT5	2	10	100.0		100.0	2.0	0.20		
L	SQT5	3	9	90.0		99.9	1.4	0.16		
L	SQT5	4	10	100.0		100.0	2.0	0.20		
L	SQT5	5	10	100.0		100.0	1.7	0.17		
L	SQT5	6	7	70.0		99.7	0.8	0.11		
L	SQT5	7	9	90.0		99.9	1.8	0.20		
L	SQT5	8	9	90.0	10.4	99.9	1.9	0.21	0.18	0.03
M	SQT8	1	9	90.0		99.9	1.9	0.21		
M	SQT8	2	8	80.0		99.8	1.4	0.18		
M	SQT8	3	8	80.0		99.8	1.6	0.20		
M	SQT8	4	4	40.0		99.4	0.8	0.20		
M	SQT8	5	10	100.0		100.0	2.4	0.24		
M	SQT8	6	10	100.0		100.0	1.5	0.15		
M	SQT8	7	1	10.0		99.1	0.1	0.10		
M	SQT8	8	9	90.0	32.0	99.9	1.9	0.21	0.19	0.04

APPENDIX 11

Water Chemistry Parameters for *H. azteca* Exposed to Sediments
and a Dilution Series Under Laboratory Light,
1 January 2006 to 13 January 2006

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006
Temperature (° C)

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	1	22.8	23.2	23.2	22.5	22.7	23.3	22.6	22.7	23.2	22.8	23.0	22.7	23.0
3-Jan-06	0	7:00	2	23.0	23.2	23.4	22.7	22.8	23.4	22.5	22.8	23.4	23.0	23.1	22.7	22.9
3-Jan-06	0	7:00	3	22.9	23.2	23.3	22.8	22.8	23.4	22.9	22.7	23.2	22.8	23.1	22.7	23.2
3-Jan-06	0	7:00	4	22.9	23.4	23.4	22.8	23.0	23.4	22.9	22.8	23.2	23.0	23.1	22.7	23.0
3-Jan-06	0	7:00	5	22.9	23.4	23.3	22.8	22.7	23.3	22.7	22.8	23.3	23.3	23.2	22.7	23.0
3-Jan-06	0	7:00	6	22.8	23.4	23.2	22.8	22.9	23.3	22.8	22.8	23.2	23.0	23.2	22.7	23.1
3-Jan-06	0	7:00	7	22.9	23.4	23.2	22.9	22.6	23.2	22.7	22.7	23.4	23.1	23.2	22.7	22.9
3-Jan-06	0	7:00	8	22.8	23.3	23.2	22.8	22.9	23.2	22.8	22.8	23.3	22.9	23.0	22.7	22.9
4-Jan-06	1	8:45	4	23.0	23.5	23.5	23.0	23.2	23.4	23.2	23.1	23.5	23.5	23.8	23.0	23.2
4-Jan-06	1	8:45	6	23.1	23.8	23.5	23.0	23.2	23.4	23.1	23.2	23.6	23.3	23.6	23.0	23.3
4-Jan-06	1	14:30	4	23.0	23.2	23.0	22.8	22.7	23.1	22.7	22.8	23.2	23.0	22.9	22.6	22.9
4-Jan-06	1	14:30	8	22.7	23.2	23.2	22.9	22.6	23.2	22.8	22.8	23.3	23.2	23.0	22.8	23.1
5-Jan-06	2	8:50	4	23.0	23.2	23.1	22.6	22.7	23.2	22.7	22.9	23.0	23.0	23.1	22.4	23.0
5-Jan-06	2	8:50	5	22.8	23.2	23.1	22.6	22.7	23.3	22.7	22.7	23.1	23.1	23.0	22.5	23.0
5-Jan-06	2	15:00	2	22.5	23.1	23.0	22.3	22.4	22.9	22.5	22.6	23.0	22.9	22.9	22.1	22.7
5-Jan-06	2	15:00	4	22.6	23.0	23.1	22.3	22.6	22.9	22.7	22.6	23.1	22.8	23.0	22.2	22.9
6-Jan-06	3	9:00	4	22.6	23.1	23.2	22.5	22.4	23.1	22.3	22.4	23.1	22.7	22.9	22.1	22.5
6-Jan-06	3	9:00	7	22.6	23.2	23.2	22.5	22.4	22.9	22.3	22.5	23.1	22.8	22.5	22.1	22.6
6-Jan-06	3	14:45	3	22.3	22.9	22.8	22.1	22.1	23.0	21.9	22.0	22.9	22.7	22.7	22.0	22.7
6-Jan-06	3	14:45	4	22.3	23.0	22.8	22.0	22.1	23.1	22.2	22.1	23.0	22.8	22.8	22.0	22.8
7-Jan-06	4	8:00	1	23.7	23.7	23.7	23.7	23.8	23.7	23.3	23.7	23.7	23.6	23.6	23.4	23.7
7-Jan-06	4	8:00	4	23.8	23.8	23.8	23.7	23.8	23.8	23.6	23.8	23.2	23.6	23.6	23.5	23.7
7-Jan-06	4	15:15	3	23.2	23.8	23.3	23.1	23.2	23.7	23.1	23.2	23.5	23.8	23.7	23.2	23.8
7-Jan-06	4	15:15	4	23.3	23.8	23.4	23.2	23.2	23.8	23.2	23.3	23.7	23.8	23.8	23.2	23.7
8-Jan-06	5	8:30	4	23.1	23.6	23.6	23.1	23.2	23.6	23.1	23.1	23.6	23.5	23.4	23.0	23.5
8-Jan-06	5	8:30	6	23.0	23.7	23.6	23.1	23.2	23.7	23.2	23.2	23.6	23.5	23.5	23.0	23.6
8-Jan-06	5	14:30	4	22.9	23.9	23.7	22.5	23.0	23.9	22.9	22.9	23.8	23.7	23.8	22.9	23.6
8-Jan-06	5	14:30	8	23.0	23.7	23.7	23.0	22.9	23.9	22.9	22.9	23.9	23.8	23.8	22.8	23.6
9-Jan-06	6	8:15	4	22.8	22.9	23.7	23.0	23.1	23.7	22.9	22.9	23.8	23.8	23.8	22.9	23.4
9-Jan-06	6	8:15	5	22.8	23.8	23.7	23.0	23.1	23.8	23.0	23.3	24.0	23.6	24.0	22.9	23.6
9-Jan-06	6	13:00	2	23.3	24.1	23.9	23.3	23.2	23.9	23.2	23.2	24.1	23.9	23.7	23.1	23.7
9-Jan-06	6	13:00	4	23.4	24.1	24.0	23.3	23.1	23.8	23.2	23.2	24.1	23.8	23.7	23.0	23.7
10-Jan-06	7	8:50	4	23.4	23.9	23.9	23.3	23.3	23.9	23.4	23.2	24.0	23.8	24.0	23.1	23.8
10-Jan-06	7	8:50	7	23.2	24.2	23.9	23.1	23.2	23.8	23.4	23.2	24.0	24.1	24.0	23.3	23.8
10-Jan-06	7	15:00	3	23.5	24.0	23.8	23.5	23.3	23.8	23.4	23.4	24.0	23.7	23.6	23.1	23.6
10-Jan-06	7	15:00	4	23.6	24.0	23.7	23.5	23.4	23.8	23.5	23.5	24.0	23.7	23.7	23.1	23.5
11-Jan-06	8	8:30	4	23.4	23.8	23.7	23.2	23.3	24.2	23.2	23.3	24.2	23.9	24.0	23.3	23.9
11-Jan-06	8	8:30	6	23.4	24.1	23.6	23.2	23.4	24.2	23.4	23.4	24.2	24.2	24.0	23.0	24.1
11-Jan-06	8	15:00	4	23.3	24.0	23.9	23.1	23.3	23.7	23.2	23.2	24.0	24.0	23.5	23.1	24.0
11-Jan-06	8	15:00	8	23.4	24.0	24.0	23.2	23.3	23.9	23.3	23.2	24.1	24.1	23.9	23.4	23.9
12-Jan-06	9	8:00	4	23.3	24.1	24.1	23.4	23.4	24.1	23.3	23.4	24.2	24.0	24.0	23.3	24.2
12-Jan-06	9	8:00	6	23.3	24.3	24.1	23.4	23.5	24.2	23.3	23.5	24.3	24.1	24.1	23.4	24.1
12-Jan-06	9	14:00	4	23.3	23.7	24.0	23.3	23.6	23.9	23.4	23.3	24.2	24.0	24.1	23.3	24.0
12-Jan-06	9	14:00	8	23.1	23.9	23.9	23.5	23.6	24.1	23.5	23.5	24.3	24.0	24.1	23.4	24.0

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
13-Jan-06	10	7:05	1	23.2	24.0	23.9	23.0	23.4	23.9	23.2	23.3	23.9	23.7	23.8	231.0	23.7
13-Jan-06	10	7:05	2	23.4	24.0	24.0	23.4	23.5	24.0	23.3	23.3	24.0	23.8	23.8	23.1	23.9
13-Jan-06	10	7:05	3	23.2	24.1	23.9	23.3	23.1	24.1	23.3	23.3	24.0	23.9	23.7	23.3	23.9
13-Jan-06	10	7:05	4	23.3	24.2	24.0	23.3	23.5	24.1	23.3	23.3	24.0	24.0	23.8	23.2	24.0
13-Jan-06	10	7:05	5	23.3	24.1	24.0	23.2	23.2	24.0	23.3	23.1	24.0	24.0	23.7	23.1	23.9
13-Jan-06	10	7:05	6	23.3	24.2	23.9	23.3	23.4	24.0	23.3	23.3	24.0	24.1	23.7	23.1	23.6
13-Jan-06	10	7:05	7	23.3	24.2	23.9	23.3	23.3	24.1	23.4	23.3	24.0	23.8	23.8	23.2	23.7
13-Jan-06	10	7:05	8	23.4	24.2	23.8	23.4	23.3	24.0	23.3	23.4	24.0	23.9	23.8	23.2	23.8
			Average	**23.1**	**23.7**	**23.6**	**23.0**	**23.1**	**23.6**	**23.0**	**23.1**	**23.7**	**23.5**	**23.5**	**26.9**	**23.5**
			Minimum	22.3	22.9	22.8	22.0	22.1	22.9	21.9	22.0	22.9	22.7	22.5	22.0	22.5
			Maximum	23.8	24.3	24.1	23.7	23.8	24.2	23.6	23.8	24.3	24.2	24.1	231.0	24.2

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	1	7.1	6.1	5.8	5.2	4.0	6.0	5.4	6.6	4.6	3.7	4.0	6.2	2.5
3-Jan-06	0	7:00	2	7.0	6.3	5.9	5.2	5.6	6.0	5.0	7.3	6.5	4.1	3.8	6.9	3.7
3-Jan-06	0	7:00	3	6.9	6.8	5.0	4.6	6.8	5.4	5.1	5.3	4.8	3.9	4.1	6.8	4.8
3-Jan-06	0	7:00	4	7.0	6.9	5.1	3.9	7.5	6.6	5.9	7.1	6.5	3.1	4.1	6.3	3.5
3-Jan-06	0	7:00	5	6.9	6.7	5.1	4.9	4.8	6.4	5.0	4.3	7.3	3.8	4.1	5.4	5.8
3-Jan-06	0	7:00	6	7.0	6.2	6.0	4.7	5.1	7.0	4.4	6.9	4.2	3.7	6.5	5.6	6.8
3-Jan-06	0	7:00	7	6.9	5.9	6.2	4.9	4.4	5.7	6.4	7.3	4.3	4.2	3.5	5.6	3.4
3-Jan-06	0	7:00	8	7.3	6.3	4.6	6.0	7.2	6.0	5.1	6.9	6.7	4.6	5.1	5.3	4.8
4-Jan-06	1	8:45	4	7.4	6.0	5.6	5.0	6.3	5.4	6.4	6.9	5.8	6.3	7.0	7.0	5.6
4-Jan-06	1	8:45	6	6.5	6.7	6.6	6.0	5.1	6.0	6.3	5.9	5.0	4.2	6.8	6.7	4.4
4-Jan-06	1	14:30	4	7.0	7.2	6.9	5.2	7.7	6.5	7.7	6.9	7.0	7.4	7.0	6.9	3.5
4-Jan-06	1	14:30	8	7.0	6.8	6.8	6.6	7.8	6.6	7.4	7.4	6.3	6.4	5.8	6.2	3.3
5-Jan-06	2	8:50	4	7.0	8.3	8.0	6.6	7.5	6.0	7.5	7.1	7.1	7.0	7.2	7.6	5.4
5-Jan-06	2	8:50	5	7.2	8.2	7.3	7.5	5.8	6.8	7.5	7.1	6.8	7.4	7.2	7.5	6.9
5-Jan-06	2	15:00	2	7.5	8.2	8.3	7.7	4.7	6.2	7.6	7.5	7.5	7.0	7.5	5.8	4.8
5-Jan-06	2	15:00	4	7.4	8.1	7.9	7.2	7.2	6.8	7.1	7.1	7.6	7.1	7.6	6.8	6.8
6-Jan-06	3	9:00	4	7.0	6.9	7.4	6.4	7.8	5.9	7.5	7.2	7.0	7.3	6.9	6.9	7.0
6-Jan-06	3	9:00	7	7.3	6.9	7.5	7.0	5.2	7.9	7.1	7.0	6.9	7.4	6.5	7.0	3.5
6-Jan-06	3	14:45	3	7.0	6.7	7.3	6.5	7.2	6.9	8.1	8.2	8.2	7.0	7.7	8.2	7.6
6-Jan-06	3	14:45	4	6.9	7.1	7.6	6.6	7.4	7.1	8.3	7.4	8.0	7.1	7.7	7.8	7.1
7-Jan-06	4	8:00	1	7.3	7.6	7.6	4.6	7.3	6.8	8.4	7.2	7.7	6.4	7.5	6.9	4.8
7-Jan-06	4	8:00	4	7.3	7.7	7.0	5.6	6.8	6.6	8.4	6.9	6.7	7.4	6.9	6.6	6.5
7-Jan-06	4	15:15	3	6.7	6.7	6.7	6.5	7.0	6.4	7.5	7.2	7.3	7.6	7.6	7.4	5.2
7-Jan-06	4	15:15	4	6.8	6.9	6.8	6.2	7.1	6.7	6.8	7.1	6.7	7.4	7.6	7.3	5.6
8-Jan-06	5	8:30	4	6.8	6.9	6.5	6.5	6.7	6.3	6.6	7.4	7.1	6.2	7.3	6.7	7.3
8-Jan-06	5	8:30	6	6.8	6.7	6.8	6.5	6.5	6.9	6.7	7.1	6.6	6.3	6.8	6.6	6.9
8-Jan-06	5	14:30	4	6.7	7.7	7.6	6.6	7.6	6.9	6.9	7.5	6.6	6.6	7.5	6.6	7.3
8-Jan-06	5	14:30	8	6.7	7.1	6.6	6.8	7.0	7.6	6.9	6.9	7.4	6.7	6.6	6.4	7.2
9-Jan-06	6	8:15	4	7.7	7.8	6.5	6.9	6.9	6.3	7.4	7.3	6.0	6.0	6.4	7.1	7.6
9-Jan-06	6	8:15	5	7.6	7.8	7.0	7.0	7.4	7.4	5.9	7.7	6.5	7.1	5.8	7.2	7.5
9-Jan-06	6	13:00	2	6.8	7.4	6.6	6.7	7.6	6.4	6.4	6.9	7.1	6.1	7.3	6.9	6.8
9-Jan-06	6	13:00	4	7.1	7.7	6.7	6.6	7.6	7.3	7.0	6.8	7.4	7.2	8.1	7.0	7.1
10-Jan-06	7	8:50	4	7.4	8.3	7.4	7.0	7.3	5.9	6.6	7.1	7.1	5.9	6.7	7.5	6.7
10-Jan-06	7	8:50	7	7.5	8.2	7.0	7.3	7.0	7.0	6.7	7.0	7.8	6.8	7.0	7.6	6.8
10-Jan-06	7	15:00	3	7.0	6.9	7.4	7.2	6.7	7.1	6.5	6.8	6.4	5.9	5.2	6.6	7.2
10-Jan-06	7	15:00	4	7.2	7.1	7.4	6.9	6.5	6.4	6.9	6.7	6.3	6.3	5.2	6.5	7.2
11-Jan-06	8	8:30	4	7.0	7.9	6.8	7.5	7.5	6.0	7.8	7.6	6.3	7.1	7.3	7.1	8.1
11-Jan-06	8	8:30	6	6.8	6.7	6.8	6.3	7.0	5.9	7.5	7.1	6.1	7.2	7.4	7.2	6.5
11-Jan-06	8	15:00	4	6.8	7.2	7.8	7.8	7.5	7.3	7.4	7.5	8.0	6.3	7.3	6.8	6.9
11-Jan-06	8	15:00	8	7.0	6.9	7.8	7.7	7.7	7.3	7.5	7.6	8.0	6.1	6.8	7.0	7.1
12-Jan-06	9	8:00	4	6.9	7.0	6.5	6.2	7.0	6.1	6.4	6.8	7.0	6.4	7.1	6.7	6.5
12-Jan-06	9	8:00	6	7.2	6.6	6.4	6.0	7.1	6.2	5.7	6.1	7.1	7.1	7.0	6.7	7.1
12-Jan-06	9	14:00	4	6.6	7.3	6.4	7.1	6.3	6.6	7.7	7.1	7.2	7.3	7.1	7.3	6.8
12-Jan-06	9	14:00	8	6.7	7.2	6.3	6.0	6.7	6.8	7.5	6.9	7.0	7.3	6.4	6.7	6.7

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
13-Jan-06	10	7:05	1	6.7	7.5	7.0	7.1	7.0	5.7	7.1	6.6	6.2	6.0	6.8	7.3	7.4
13-Jan-06	10	7:05	2	6.6	7.3	6.2	7.3	7.4	4.9	5.6	6.2	5.3	5.8	6.6	7.1	7.4
13-Jan-06	10	7:05	3	6.9	6.7	6.8	6.7	7.5	6.3	6.1	6.5	6.2	6.5	6.6	6.6	7.3
13-Jan-06	10	7:05	4	7.0	6.6	6.6	6.9	7.6	5.4	5.9	6.7	6.1	6.9	6.9	6.7	7.5
13-Jan-06	10	7:05	5	5.7	6.9	6.5	6.4	7.0	6.1	6.2	6.5	6.3	6.6	7.0	6.8	7.5
13-Jan-06	10	7:05	6	5.5	6.9	6.0	5.9	7.4	6.1	6.2	6.7	6.4	6.4	6.1	6.8	7.1
13-Jan-06	10	7:05	7	6.4	6.6	6.4	7.1	6.9	6.2	6.4	6.7	6.4	6.8	6.2	6.9	6.2
13-Jan-06	10	7:05	8	5.5	6.6	6.4	6.5	7.3	6.3	6.3	6.4	6.4	6.1	6.6	7.3	7.0
			Average	**6.9**	**7.1**	**6.7**	**6.4**	**6.8**	**6.4**	**6.7**	**6.9**	**6.6**	**6.2**	**6.5**	**6.8**	**6.2**
			Minimum	5.5	5.9	4.6	3.9	4.0	4.9	4.4	4.3	4.2	3.1	3.5	5.3	2.5
			Maximum	7.7	8.3	8.3	7.8	7.8	7.9	8.4	8.2	8.2	7.6	8.1	8.2	8.1

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006

pH

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	1	7.80	7.56	7.46	7.22	7.74	7.62	7.87	7.96	7.53	7.89	7.77	7.54	6.90
3-Jan-06	0	7:00	4	8.13	7.89	7.88	7.23	7.73	7.80	7.70	7.97	7.59	7.10	7.17	7.55	7.09
3-Jan-06	0	7:00	5	8.17	8.00	7.28	7.22	7.10	7.87	7.73	7.79	7.78	7.20	7.14	7.35	7.55
3-Jan-06	0	7:00	8	8.18	7.76	7.17	7.01	7.70	7.64	7.47	7.95	7.85	7.21	7.29	7.59	7.13
13-Jan-06	10	7:05	1	7.95	8.18	8.01	7.87	8.01	7.59	8.01	8.06	7.92	7.80	7.92	7.92	7.93
13-Jan-06	10	7:05	4	7.96	8.17	8.06	7.90	8.05	7.59	7.63	7.94	7.93	8.03	7.79	7.84	8.00
13-Jan-06	10	7:05	5	7.76	8.22	8.00	7.83	7.74	7.79	7.87	8.00	8.01	8.06	7.96	7.96	8.02
13-Jan-06	10	7:05	8	7.79	8.23	7.81	7.96	7.94	7.91	7.85	8.03	8.01	7.89	7.86	7.98	7.98
			Average	**7.97**	**8.00**	**7.71**	**7.53**	**7.75**	**7.73**	**7.77**	**7.96**	**7.83**	**7.65**	**7.61**	**7.72**	**7.58**
			Minimum	7.76	7.56	7.17	7.01	7.10	7.59	7.47	7.79	7.53	7.10	7.14	7.35	6.90
			Maximum	8.18	8.23	8.06	7.96	8.05	7.91	8.01	8.06	8.01	8.06	7.96	7.98	8.02

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	1	146	143	156	155	129	155	154	143	148	150	142	146	144
3-Jan-06	0	7:00	8	147	143	164	145	133	151	142	142	144	149	145	144	142
13-Jan-06	10	7:05	1	134	131	138	133	131	141	138	135	139	141	136	136	137
13-Jan-06	10	7:05	8	135	130	139	133	130	136	138	134	136	139	136	133	135
			Average	**141**	**137**	**149**	**141**	**131**	**145**	**143**	**139**	**141**	**145**	**140**	**140**	**139**
			Minimum	134	130	138	133	129	136	138	134	136	139	136	133	135
			Maximum	147	143	164	155	133	155	154	143	148	150	145	146	144

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006
nmonia (ppm)

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	1	<0.063	0.279	0.265	0.604	<0.063	0.219	0.176	0.131	0.168	<0.063	<0.063	<0.063	<0.063
3-Jan-06	0	7:00	8	<0.063	0.196	0.480	0.264	<0.063	0.258	0.250	0.128	0.089	<0.063	<0.063	<0.063	<0.063
13-Jan-06	10	7:05	1	0.162	<0.063	0.173	0.242	0.140	0.394	0.170	0.149	0.217	0.101	0.160	0.160	0.144
13-Jan-06	10	7:05	8	0.263	<0.063	0.195	0.224	0.126	0.241	0.192	0.150	0.195	0.083	0.159	0.160	0.150
			Average	**0.122**	**0.135**	**0.278**	**0.334**	**0.082**	**0.278**	**0.197**	**0.140**	**0.167**	**0.062**	**0.100**	**0.100**	**0.089**
			Minimum	<0.063	<0.063	0.173	0.224	<0.063	0.219	0.170	0.128	0.089	<0.063	<0.063	<0.063	<0.063
			Maximum	0.263	0.279	0.480	0.604	0.140	0.394	0.250	0.150	0.217	0.101	0.160	0.160	0.150

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006
DOC (ppm)

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	1	2.9	2.7	3.5	5	44	3.9	3.6	3.7	5.7	9	12.9	9	5.3
3-Jan-06	0	7:00	8	2.3	2.8	3.6	5.1	32	3.6	3.3	3.8		14.5	18.5	6.7	3.5
13-Jan-06	10	7:05	1	2.2	2.5	3.8	2	2.2	1.8	1.6	1.7	2.6	2.1	2.6	3.4	2.7
13-Jan-06	10	7:05	8	1.9	2.5	2.9	1.8	2.7	2.4	2.1	3.9	2.1	1.8	2.5	1.8	2
			Average	**2.3**	**2.6**	**3.5**	**3.5**	**20.2**	**2.9**	**2.7**	**3.3**	**3.5**	**6.9**	**9.1**	**5.2**	**3.4**
			Minimum	1.9	2.5	2.9	1.8	2.2	1.8	1.6	1.7	2.1	1.8	2.5	1.8	2.0
			Maximum	2.9	2.8	3.8	5.1	44.0	3.9	3.6	3.9	5.7	14.5	18.5	9.0	5.3

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	3	44.4	45.2	53.2	54.0	56.0	52.4	54.8	52.4	52.0		68.0	57.2	
3-Jan-06	0	7:00	7	55.2	56.8	49.2	54.0		53.6	50.0	54.0	56.4	64.4		60.4	
13-Jan-06	10	7:05	3	44.0	43.6	48.8	48.4	47.2	48.0	50.4	48.8	48.0	53.2	50.0	47.6	47.6
13-Jan-06	10	7:05	7	51.6	44.8	48.0	48.4	36.8	49.2	49.2	46.4	50.4	51.6	50.8	49.2	49.6
			Average	**48.8**	**47.6**	**49.8**	**51.2**	**46.7**	**50.8**	**51.1**	**50.4**	**51.7**	**56.4**	**56.3**	**53.6**	**48.6**
			Minimum	44.0	43.6	48.0	48.4	36.8	48.0	49.2	46.4	48.0	51.6	50.0	47.6	47.6
			Maximum	55.2	56.8	53.2	54.0	56.0	53.6	54.8	54.0	56.4	64.4	68.0	60.4	49.6

Appendix Table 11. Water Chemistry Parameters for *H. azteca* Exposed to Sediments and a Dilution Series Under Laboratory Light, 3 January 2006 to 13 January 2006
Alkalinity (mg/L as CaCOe)

Date	Day	Time	Rep	Sand	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	25% STQ1	50% SQT1	100% SQT1	SQT4	SQT2	SQT5	SQT8
3-Jan-06	0	7:00	2	50.4	51.6	48.8	59.6	50.0	51.6	52.4	52.0	57.6	66.4	59.6	56.8	59.2
3-Jan-06	0	7:00	6	47.6	52.8	50.4	57.6	51.6	50.0	49.6	53.6	57.2	67.2	62.4	58.4	54.8
13-Jan-06	10	7:05	2	54.0	50.4	51.2	54.8	52.0	52.8	52.8	51.6	55.6	58.0	56.8	54.4	54.4
13-Jan-06	10	7:05	6	53.6	50.8	50.4	53.2	44.4	54.0	52.8	53.2	56.8	57.2	57.2	56.0	56.4
			Average	**51.4**	**51.4**	**50.2**	**56.3**	**49.5**	**52.1**	**51.9**	**52.6**	**56.8**	**62.2**	**59.0**	**56.4**	**56.2**
			Minimum	47.6	50.4	48.8	53.2	44.4	50.0	49.6	51.6	55.6	57.2	56.8	54.4	54.4
			Maximum	54.0	52.8	51.2	59.6	52.0	54.0	52.8	53.6	57.6	67.2	62.4	58.4	59.2

APPENDIX 12

Survival and Growth of *H. azteca* following 10-d Exposure to Ashland Harbor Sediment and Dilution Series Under UV Light, 1 January 2006 to 13 January 2006

Appendix Table 12. Survival and Growth of *H. azteca* following 10-d exposure to Ashland Harbor Sediment and Dilution Series Under UV light, 3 January 2006 to 13 January 2

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected % Mortality	Total Dry wt (mg)	Individual Dry wt (mg)	Average Dry wt (mg)	Standard Deviation
A	Silica Sand	1	10	100			1.2	0.12		
A	Silica Sand	2	9	90			1.2	0.13		
A	Silica Sand	3	11	110			1.1	0.10		
A	Silica Sand	4	10	100			1.2	0.12		
A	Silica Sand	5	10	100			1.1	0.11		
A	Silica Sand	6	10	100			1.5	0.15		
A	Silica Sand	7	8	80			1.1	0.14		
A	Silica Sand	8	11	110	9.9		1.3	0.12	0.12	0.02
B	Silica Sand w/ leafs	1	10	100			1.9	0.19		
B	Silica Sand w/ leafs	2	9	90			1.5	0.17		
B	Silica Sand w/ leafs	3	9	90			1.5	0.17		
B	Silica Sand w/ leafs	4	10	100			1.6	0.16		
B	Silica Sand w/ leafs	5	9	90			1	0.11		
B	Silica Sand w/ leafs	6	10	100			1.4	0.14		
B	Silica Sand w/ leafs	7	10	100			2.2	0.22		
B	Silica Sand w/ leafs	8	12	120	9.9		2	0.17	0.17	0.03
C	W. Bearskin	1	9	90			0.8	0.09		
C	W. Bearskin	2	10	100			1.2	0.12		
C	W. Bearskin	3	8	80			1	0.13		
C	W. Bearskin	4	9	90			0.9	0.10		
C	W. Bearskin	5	10	100			1.2	0.12		
C	W. Bearskin	6	9	90			0.9	0.10		
C	W. Bearskin	7	9	90			1	0.11		
C	W. Bearskin	8	9	90	6.4		1	0.11	0.11	0.01
D	Dilution sediment	1	9	90			1	0.11		
D	Dilution sediment	2	10	100			1.4	0.14		
D	Dilution sediment	3	10	100			1	0.10		
D	Dilution sediment	4	10	100			1.1	0.11		
D	Dilution sediment	5	10	100			1.2	0.12		
D	Dilution sediment	6	10	100			1	0.10		
D	Dilution sediment	7	10	100			1	0.10		
D	Dilution sediment	8	9	90	4.6		1.1	0.12	0.11	0.01
F	SQT9	1	9	90			1.7	0.19		
F	SQT9	2	10	100			1.5	0.15		
F	SQT9	3	9	90			1.6	0.18		
F	SQT9	4	10	100			1.4	0.14		
F	SQT9	5	10	100			1.6	0.16		
F	SQT9	6	10	100			1.1	0.11		
F	SQT9	7	7	70			1.5	0.21		
F	SQT9	8	8	80	11.3		1	0.13	0.16	0.03
G	SQT11	1	8	80			1	0.13		
G	SQT11	2	8	80			0.9	0.11		
G	SQT11	3	7	70			0.7	0.10		
G	SQT11	4	10	100			1.3	0.13		
G	SQT11	5	9	90			1	0.11		
G	SQT11	6	7	70			1	0.14		
G	SQT11	7	6	60			0.9	0.15		
G	SQT11	8	8	80	12.5		1	0.13	0.12	0.02
H	12.5%	1	8	80		99.8	0.8	0.10		
H	12.5%	2	9	90		99.9	0.8	0.09		
H	12.5%	3	3	30		99.3	0.6	0.20		
H	12.5%	4	9	90		99.9	0.9	0.10		
H	12.5%	5	10	100		100.0	1.3	0.13		
H	12.5%	6	8	80		99.8	0.9	0.11		
H	12.5%	7	8	80		99.8	0.8	0.10		
H	12.5%	8	8	80	21.0	99.8	0.8	0.10	0.12	0.04
I	12.5% w/ Leafs	1	10	100		100.0	1.6	0.16		
I	12.5% w/ Leafs	2	10	100		100.0	1.2	0.12		
I	12.5% w/ Leafs	3	9	90		99.9	1.6	0.18		
I	12.5% w/ Leafs	4	8	80		99.8	1.2	0.15		
I	12.5% w/ Leafs	5	10	100		100.0	1.4	0.14		
I	12.5% w/ Leafs	6	10	100		100.0	1.6	0.16		
I	12.5% w/ Leafs	7	10	100		100.0	2	0.20		
I	12.5% w/ Leafs	8	9	90	7.6	99.9	1.3	0.14	0.16	0.02

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected % Mortality	Total Dry wt (mg)	Individual Dry wt (mg)	Average Dry wt (mg)	Standard Deviation
J	25%	1	0	0		99.0				
J	25%	2	0	0		99.0				
J	25%	3	4	40		99.4	0.4	0.10		
J	25%	4	0	0		99.0				
J	25%	5	2	20		99.2	0.3	0.15		
J	25%	6	0	0		99.0				
J	25%	7	2	20		99.2	0.2	0.10		
J	25%	8	1	10	14.6	99.1	0.1	0.10	0.11	0.03
K	25% w/ Leafs	1	7	70		99.7	1.1	0.16		
K	25% w/ Leafs	2	4	40		99.4	0.3	0.08		
K	25% w/ Leafs	3	5	50		99.5	0.8	0.16		
K	25% w/ Leafs	4	7	70		99.7	0.7	0.10		
K	25% w/ Leafs	5	6	60		99.6	0.6	0.10		
K	25% w/ Leafs	6	4	40		99.4	0.4	0.10		
K	25% w/ Leafs	7	8	80		99.8	1.1	0.14		
K	25% w/ Leafs	8	3	30	17.7	99.3	0.3	0.10	0.12	0.03
L	50%	1	0	0		99.0				
L	50%	2	0	0		99.0				
L	50%	3	0	0		99.0				
L	50%	4	0	0		99.0				
L	50%	5	0	0		99.0				
L	50%	6	0	0		99.0				
L	50%	7	0	0		99.0				
L	50%	8	0	0	0.0	99.0				
M	50% w/ Leafs	1	0	0		99.0				
M	50% w/ Leafs	2	0	0		99.0				
M	50% w/ Leafs	3	0	0		99.0				
M	50% w/ Leafs	4	0	0		99.0				
M	50% w/ Leafs	5	0	0		99.0				
M	50% w/ Leafs	6	0	0		99.0				
M	50% w/ Leafs	7	0	0		99.0				
M	50% w/ Leafs	8	0	0	0.0	99.0				
N	100%	1	0	0		99.0				
N	100%	2	0	0		99.0				
N	100%	3	0	0		99.0				
N	100%	4	0	0		99.0				
N	100%	5	0	0		99.0				
N	100%	6	0	0		99.0				
N	100%	7	0	0		99.0				
N	100%	8	0	0	0.0	99.0				
O	100% w/ Leafs	1	0	0		99.0				
O	100% w/ Leafs	2	0	0		99.0				
O	100% w/ Leafs	3	0	0		99.0				
O	100% w/ Leafs	4	0	0		99.0				
O	100% w/ Leafs	5	0	0		99.0				
O	100% w/ Leafs	6	0	0		99.0				
O	100% w/ Leafs	7	0	0		99.0				
O	100% w/ Leafs	8	0	0	0.0	99.0				
P	SQT2	1	8	80		99.8	1.3	0.16		
P	SQT2	2	10	100		100.0	1.2	0.12		
P	SQT2	3	10	100		100.0	1.1	0.11		
P	SQT2	4	8	80		99.8	0.7	0.09		
P	SQT2	5	10	100		100.0	1	0.10		
P	SQT2	6	9	90		99.9	1.2	0.13		
P	SQT2	7	9	90		99.9	1.1	0.12		
P	SQT2	8	9	90	8.3	99.9	0.9	0.10	0.12	0.02
Q	SQT4	1	9	90		99.9	1	0.11		
Q	SQT4	2	8	80		99.8	0.9	0.11		
Q	SQT4	3	7	70		99.7	0.8	0.11		
Q	SQT4	4	5	50		99.5	0.6	0.12		
Q	SQT4	5	7	70		99.7	0.6	0.09		
Q	SQT4	6	6	60		99.6	0.6	0.10		
Q	SQT4	7	7	70		99.7	1	0.14		
Q	SQT4	8	8	80	12.5	99.8	1	0.13	0.11	0.02

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected % Mortality	Total Dry wt (mg)	Individual Dry wt (mg)	Average Dry wt (mg)	Standard Deviation
R	SQT5	1	3	30		99.3	0.3	0.10		
R	SQT5	2	6	60		99.6	0.7	0.12		
R	SQT5	3	5	50		99.5	0.4	0.08		
R	SQT5	4	5	50		99.5	0.8	0.16		
R	SQT5	5	0	0		99.0				
R	SQT5	6	6	60		99.6	0.8	0.13		
R	SQT5	7	4	40		99.4	0.5	0.13		
R	SQT5	8	3	30	20.0	99.3	0.4	0.13	0.12	0.03
S	SQT8	1	10	100		100.0	1.7	0.17		
S	SQT8	2	9	90		99.9	1.5	0.17		
S	SQT8	3	9	90		99.9	1.2	0.13		
S	SQT8	4	9	90		99.9	1.3	0.14		
S	SQT8	5	8	80		99.8	1.1	0.14		
S	SQT8	6	10	100		100.0	2	0.20		
S	SQT8	7	9	90		99.9	1.6	0.18		
S	SQT8	8	5	50	16.0	99.5	0.6	0.12	0.16	0.03

APPENDIX 13

Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV Light, 1 January 2006 to 13 January 2006

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006
Temeprature (° C)

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	% SQT1 w/	25% SQT1	SQT1 w/ l	50% SQT1	SQT1 w/ l	00% SQT	SQT1 w/ l	SQT2	SQT4	SQT5	SQT8
3-Jan-06	0	7:30	1	22.5	22.6	22.2	22.7	22.3	22.3	22.0	22.7	22.7	22.8	22.6	22.7	22.6	22.2	22.2	22.4	22.7	22.2
3-Jan-06	0	7:30	2	22.7	22.6	22.3	22.8	22.3	22.4	22.0	22.7	22.8	22.7	22.7	22.7	22.4	22.4	22.4	22.5	22.7	22.3
3-Jan-06	0	7:30	3	22.7	22.6	22.3	22.8	22.5	22.5	21.9	22.8	22.7	22.7	22.7	22.7	22.7	22.3	22.4	22.6	22.8	22.3
3-Jan-06	0	7:30	4	22.7	22.7	22.3	22.9	22.4	22.7	21.9	22.9	22.7	22.8	22.7	22.7	22.5	22.3	22.7	22.7	22.7	22.4
3-Jan-06	0	7:30	5	22.7	22.6	22.3	22.8	22.6	22.5	21.9	22.7	22.6	22.7	22.7	22.7	22.4	22.5	22.7	22.6	22.8	22.7
3-Jan-06	0	7:30	6	22.7	22.6	22.4	22.7	22.6	22.7	22.1	22.8	22.8	22.8	22.6	22.8	22.5	22.4	22.5	22.7	22.8	22.6
3-Jan-06	0	7:30	7	22.7	22.6	22.4	22.7	22.5	22.5	22.1	22.7	22.7	22.8	22.7	22.7	22.4	22.7	22.6	22.6	22.9	22.6
3-Jan-06	0	7:30	8	22.7	22.4	22.3	22.8	22.7	22.7	22.1	22.9	22.8	22.7	22.6	22.6	22.6	22.6	22.4	22.6	22.7	22.7
4-Jan-06	1	9:00	4	22.8	23.0	22.3	23.2	22.8	22.9	23.0	23.2	23.3	23.2	23.0	23.1	22.9	22.9	23.0	23.2	23.0	22.9
4-Jan-06	1	9:00	6	22.9	23.0	22.4	23.2	23.0	23.0	23.0	23.3	23.2	23.2	23.0	23.1	23.0	23.0	23.0	23.1	23.0	23.0
4-Jan-06	1	14:45	4	23.0	22.9	22.5	22.8	22.5	22.8	21.5	22.8	23.0	22.8	22.9	22.9	22.7	22.8	22.5	22.7	22.7	22.5
4-Jan-06	1	14:45	8	23.0	23.0	22.6	23.0	22.8	22.9	21.9	23.0	23.0	23.0	23.0	23.0	22.8	23.0	22.6	21.8	22.8	22.7
5-Jan-06	2	9:00	4	22.9	22.9	22.7	22.5	22.5	22.8	22.2	23.0	22.9	23.0	22.9	22.8	22.7	22.5	22.8	22.9	22.7	22.4
5-Jan-06	2	9:00	5	22.9	22.9	22.5	22.9	22.9	22.8	22.4	23.0	23.0	23.0	22.9	22.9	22.7	22.7	22.8	22.9	22.9	22.6
5-Jan-06	2	15:00	2	22.6	22.5	22.2	23.0	22.4	22.6	22.0	22.9	22.8	22.7	22.7	22.8	22.6	22.2	22.6	22.9	22.5	22.4
5-Jan-06	2	15:00	4	22.7	22.5	22.2	22.8	22.7	22.7	21.7	23.0	22.9	22.7	22.8	22.9	22.6	22.4	22.8	22.9	22.5	22.4
6-Jan-06	3	10:00	4	21.9	22.2	21.8	22.2	21.8	22.0	21.2	22.1	22.2	22.1	21.8	22.0	21.9	21.5	21.8	21.9	21.5	21.8
6-Jan-06	3	10:00	7	22.0	22.3	21.9	22.2	21.9	22.1	21.6	22.1	22.1	22.2	21.8	22.1	21.9	21.7	21.9	22.0	21.5	21.8
6-Jan-06	3	15:00	3	22.5	22.7	22.1	22.6	22.2	22.3	22.1	22.9	22.7	22.9	22.7	22.7	22.7	22.6	22.6	22.6	22.5	22.7
6-Jan-06	3	15:00	4	22.5	22.7	22.2	22.6	22.6	22.4	22.2	22.9	22.8	23.0	22.7	22.9	22.7	22.8	22.7	22.8	22.6	22.7
7-Jan-06	4	8:30	1	23.1	23.1	22.7	23.1	22.9	22.7	22.5	22.9	232.0	23.2	22.9	22.9	22.9	22.8	22.9	23.0	22.8	23.0
7-Jan-06	4	8:30	4	23.1	23.1	22.7	23.2	22.9	22.6	22.4	23.1	23.2	23.2	22.9	23.0	22.8	22.9	22.9	22.7	22.8	22.9
7-Jan-06	4	15:30	3	23.0	23.0	22.7	23.1	22.7	22.9	22.9	23.0	23.2	23.3	22.9	22.9	23.1	22.7	23.0	23.1	23.1	23.0
7-Jan-06	4	15:30	4	23.0	23.1	22.7	23.1	23.0	22.9	23.0	23.2	23.3	23.3	22.9	23.1	23.0	22.8	23.1	23.2	23.2	23.0
8-Jan-06	5	8:45	4	23.0	23.0	22.7	23.0	22.9	22.9	22.5	22.8	23.0	23.1	22.7	23.0	23.0	22.8	23.0	22.6	22.8	23.0
8-Jan-06	5	8:45	6	23.1	23.1	22.8	23.1	23.0	23.0	22.6	22.8	23.1	23.1	22.6	23.0	23.0	22.9	23.0	22.7	22.9	23.1
8-Jan-06	5	14:30	4	22.8	23.1	22.6	23.1	22.9	23.0	22.2	23.1	23.2	23.1	22.8	22.9	22.8	22.6	23.1	23.1	23.0	22.8
8-Jan-06	5	14:30	8	23.0	23.1	22.8	23.2	23.0	23.0	22.6	23.1	23.2	23.1	22.7	23.0	22.9	22.9	23.1	23.0	22.9	23.0
9-Jan-06	6	8:30	4	22.8	22.8	22.8	23.0	22.8	23.0	22.8	22.6	23.3	23.3	22.9	22.8	23.0	23.2	22.9	23.0	23.0	23.0
9-Jan-06	6	8:30	5	22.9	22.6	22.6	23.0	22.8	23.0	22.8	23.1	23.3	23.3	23.0	23.0	23.0	23.2	22.9	23.0	22.9	23.0
9-Jan-06	6	15:00	2	22.8	22.9	22.4	23.2	22.9	22.9	22.6	23.1	23.0	23.0	22.7	23.0	23.0	22.6	22.8	23.0	23.1	231.0
9-Jan-06	6	15:00	4	22.9	23.0	22.5	23.2	22.8	23.0	22.5	23.1	23.2	23.2	22.9	23.1	23.0	22.8	22.9	23.0	23.1	22.9
10-Jan-06	7	9:00	4	22.9	23.0	22.5	23.0	22.2	23.1	22.2	22.6	23.2	23.5	233.0	23.2	23.1	23.2	23.1	23.0	22.9	22.8
10-Jan-06	7	9:00	7	23.0	23.2	22.7	23.1	22.7	23.3	22.3	22.7	23.4	23.3	23.0	23.3	23.1	23.3	23.3	23.0	22.9	23.0
10-Jan-06	7	15:30	3	23.1	23.2	22.7	23.2	22.9	23.1	22.6	23.2	23.3	23.4	23.1	23.0	23.0	22.9	22.9	23.1	23.0	22.9
10-Jan-06	7	15:30	4	23.1	23.1	22.7	23.3	23.1	23.2	22.7	23.2	23.3	23.4	23.1	23.1	23.1	22.9	22.9	23.1	23.0	23.0
11-Jan-06	8	8:30	4	23.3	23.5	23.0	23.3	23.2	23.1	23.0	23.6	23.8	23.7	23.4	23.6	23.3	23.4	23.3	23.4	23.2	23.2
11-Jan-06	8	8:30	6	23.2	23.6	23.1	23.3	23.3	23.3	23.2	23.7	23.5	23.7	23.1	23.6	23.3	23.5	23.1	23.5	23.2	23.4
11-Jan-06	8	15:00	4	23.2	23.4	22.8	23.5	23.4	23.3	23.2	23.4	23.6	23.7	23.3	23.4	23.2	23.1	23.3	23.4	23.3	23.2
11-Jan-06	8	15:00	8	23.3	23.5	23.0	23.6	23.4	23.3	23.4	23.5	23.7	23.7	23.4	23.4	23.0	23.3	23.5	23.5	23.4	23.3
12-Jan-06	9	8:30	4	23.3	23.4	22.9	23.6	23.4	23.4	22.6	23.4	23.6	23.6	23.4	23.5	23.2	23.3	23.4	23.4	23.4	23.5
12-Jan-06	9	8:30	6	23.5	23.4	22.9	23.7	23.4	23.4	22.9	23.4	23.6	23.6	23.4	23.5	23.2	23.3	23.5	23.5	23.4	23.6
12-Jan-06	9	14:00	4	23.8	23.6	23.3	23.6	23.2	23.6	23.3	23.9	23.9	23.8	24.0	23.2	23.4	23.6	23.6	23.7	23.5	23.5
12-Jan-06	9	14:00	8	23.8	23.8	23.1	23.9	23.6	23.6	23.5	23.6	23.8	23.8	23.9	23.6	23.5	23.9	23.6	23.6	23.5	23.7
13-Jan-06	10	7:50	1	23.1	23.2	22.7	23.4	23.1	23.1	22.8	23.4	23.4	23.5	23.1	23.3	23.2	23.2	23.0	23.4	23.2	23.1
13-Jan-06	10	7:50	2	23.1	23.2	22.8	23.4	23.2	23.1	22.9	23.4	23.4	23.5	23.1	23.3	23.2	23.2	23.1	23.4	23.2	23.2
13-Jan-06	10	7:50	3	23.2	23.3	22.7	23.4	23.1	23.2	22.5	23.5	23.5	23.6	23.1	23.2	23.3	23.3	23.2	23.3	23.3	23.2
13-Jan-06	10	7:50	4	23.2	23.3	22.8	23.4	23.2	23.1	22.4	23.4	23.6	23.5	23.2	23.3	23.2	23.2	23.3	23.4	23.2	23.2
13-Jan-06	10	7:50	5	23.3	23.3	22.8	23.3	23.3	23.2	22.7	23.4	23.4	23.6	23.2	23.3	23.2	23.2	23.2	23.4	23.2	23.2
13-Jan-06	10	7:50	6	23.3	23.3	22.8	23.4	23.2	23.2	22.8	23.4	23.5	23.5	23.2	23.3	23.2	23.2	23.2	23.3	23.2	23.3
13-Jan-06	10	7:50	7	23.3	23.1	22.8	23.3	23.2	23.1	22.9	23.4	23.7	23.6	23.2	23.3	23.2	23.2	23.5	23.3	23.3	23.2
13-Jan-06	10	7:50	8	23.3	23.2	22.8	23.4	23.2	23.3	23.0	23.4	23.5	23.5	23.3	23.3	23.2	23.2	23.2	23.3	23.1	23.2
			Average	**23.0**	**23.0**	**22.6**	**23.1**	**22.8**	**22.9**	**22.5**	**23.1**	**27.2**	**23.2**	**27.0**	**23.0**	**22.9**	**22.9**	**22.9**	**23.0**	**22.9**	**26.9**
			Minimum	21.9	22.2	21.8	22.2	21.8	22.0	21.2	22.1	22.1	22.1	21.8	22.0	21.9	21.5	21.8	21.8	21.5	21.8
			Maximum	23.8	23.8	23.3	23.9	23.6	23.6	23.5	23.9	232.0	23.8	233.0	23.6	23.5	23.9	23.6	23.7	23.5	231.0

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	12.5% SQT1 w/ leafs	25% SQT1	25% SQT1 w/ leafs	50% SQT1	50% SQT1 w/ leafs	100% SQT 1	100% SQT1 w/ leafs	SQT2	SQT4	SQT5	SQT8
3-Jan-06	0	7:30	1	7.3	7.3	7.2	5.9	3.2	4.2	7.2	6.0	5.4	5.7	5.8	7.1	4.5	5.3	4.5	6.7	6.2	5.4
3-Jan-06	0	7:30	2	6.6	7.5	7.4	5.7	3.2	4.7	6.7	6.4	5.9	6.1	5.1	7.4	5.2	4.8	5.3	7.1	4.3	5.9
3-Jan-06	0	7:30	3	7.1	7.5	6.9	5.9	4.4	4.5	6.1	6.6	4.6	6.7	5.5	6.6	5.6	4.3	6.0	6.7	6.4	5.4
3-Jan-06	0	7:30	4	7.3	7.5	6.8	6.0	4.0	5.2	6.0	5.5	6.1	5.8	4.9	7.0	5.0	4.6	7.1	7.0	4.5	5.0
3-Jan-06	0	7:30	5	7.3	7.0	6.4	5.5	6.2	3.9	6.6	6.2	6.5	6.8	6.0	6.3	5.2	5.6	6.5	5.2	5.4	2.9
3-Jan-06	0	7:30	6	7.4	7.1	6.4	6.7	4.3	4.3	6.4	6.8	5.4	6.4	4.6	6.1	5.1	5.0	4.0	5.4	5.1	6.0
3-Jan-06	0	7:30	7	7.4	6.7	6.7	5.8	3.4	6.7	6.4	6.4	5.1	5.8	4.7	4.7	5.9	6.7	6.3	6.0	6.3	4.4
3-Jan-06	0	7:30	8	6.6	6.9	6.6	6.1	6.7	7.3	6.5	6.9	5.6	6.4	6.4	5.1	6.6	5.0	5.3	5.2	6.8	6.1
4-Jan-06	1	9:00	4	7.7	6.7	6.2	6.1	6.3	6.2	6.3	6.4	6.9	6.6	7.1	6.4	7.0	6.7	7.4	8.4	8.0	5.8
4-Jan-06	1	9:00	6	7.3	6.5	6.4	6.3	6.5	3.8	6.5	6.3	6.7	6.4	6.6	6.3	5.8	7.1	7.5	7.3	4.1	6.3
4-Jan-06	1	14:45	4	6.9	7.1	7.3	6.4	7.9	6.8	6.8	8.5	7.3	6.9	7.6	5.7	7.8	6.0	9.1	8.8	7.4	5.4
4-Jan-06	1	14:45	8	7.0	7.0	7.4	7.5	8.3	6.8	6.9	8.6	7.8	6.5	7.6	6.5	7.8	5.2	8.5	8.4	7.9	7.0
5-Jan-06	2	9:00	4	8.2	7.2	6.7	7.0	6.4	5.2	7.7	7.9	7.7	8.0	8.9	7.0	7.0	8.1	8.9	8.3	7.1	8.8
5-Jan-06	2	9:00	5	7.4	7.3	6.9	7.7	8.1	7.1	7.8	7.8	7.8	7.6	8.4	6.2	5.2	8.1	7.7	7.0	7.7	6.7
5-Jan-06	2	15:00	2	9.3	8.8	7.2	7.0	8.6	6.5	7.6	6.5	7.5	8.1	8.2	7.3	6.7	6.4	8.9	7.6	5.8	9.1
5-Jan-06	2	15:00	4	9.3	8.7	7.5	6.9	8.3	7.0	7.9	6.9	7.7	8.1	7.6	7.2	6.8	6.7	7.4	7.5	5.8	8.8
6-Jan-06	3	10:00	4	8.3	8.0	7.3	8.1	9.1	7.6	7.8	7.9	7.9	8.2	8.2	7.3	8.0	8.0	9.0	8.6	7.0	6.5
6-Jan-06	3	10:00	7	7.0	6.9	7.6	8.4	7.7	7.7	8.1	7.5	7.8	8.1	7.6	6.9	7.3	7.6	8.6	7.9	7.9	6.3
6-Jan-06	3	15:00	3	7.8	7.1	7.0	6.8	8.7	7.6	7.3	6.6	6.4	6.7	7.9	6.5	6.8	6.4	7.0	6.8	8.2	6.7
6-Jan-06	3	15:00	4	8.4	7.0	6.9	6.7	8.6	7.5	7.3	6.1	7.1	6.9	7.9	6.9	7.2	6.2	7.3	7.0	7.9	6.8
7-Jan-06	4	8:30	1	7.0	7.0	7.2	7.1	6.4	6.1	8.0	7.0	6.6	6.5	7.4	5.9	7.5	6.5	9.1	8.4	7.4	8.9
7-Jan-06	4	8:30	4	7.1	7.1	7.0	6.7	7.8	6.4	8.1	5.5	6.9	6.9	7.0	6.5	7.4	7.4	8.8	6.0	7.1	9.2
7-Jan-06	4	15:30	3	7.5	7.0	6.9	7.1	7.6	5.9	6.8	6.5	7.4	7.3	6.6	6.7	7.5	7.4	6.5	7.7	7.5	7.4
7-Jan-06	4	15:30	4	7.7	6.9	6.9	6.4	7.9	5.9	6.6	5.8	7.2	7.0	6.7	7.1	7.4	6.3	7.1	7.8	6.8	7.3
8-Jan-06	5	8:45	4	6.8	7.0	8.3	7.9	6.9	7.9	6.6	4.6	7.1	6.8	6.8	6.0	6.6	6.7	6.2	6.6	7.7	6.0
8-Jan-06	5	8:45	6	6.9	6.9	7.0	7.8	6.0	6.4	7.7	6.6	7.1	5.6	7.4	5.9	4.7	6.9	6.4	7.6	5.9	6.4
8-Jan-06	5	14:30	4	7.3	6.9	6.6	6.4	7.4	6.9	7.7	5.4	7.2	6.6	6.5	6.5	6.5	6.7	7.2	7.4	6.7	7.0
8-Jan-06	5	14:30	8	6.7	6.5	7.4	6.9	6.7	6.7	6.6	6.6	7.1	6.2	6.5	6.6	6.9	7.4	6.5	7.0	7.1	6.7
9-Jan-06	6	8:30	4	7.9	7.6	7.3	6.2	8.7	7.6	7.3	7.2	7.0	7.0	6.7	8.3	8.1	6.9	7.2	7.8	6.6	8.0
9-Jan-06	6	8:30	5	7.8	6.3	8.3	7.0	8.5	8.2	7.1	6.9	6.0	6.5	5.9	7.2	6.1	7.9	6.7	8.0	7.2	8.5
9-Jan-06	6	15:00	2	6.8	7.2	7.9	6.6	8.6	6.3	6.8	5.0	7.5	6.3	6.8	6.1	7.2	6.6	7.4	7.1	6.6	8.0
9-Jan-06	6	15:00	4	7.3	7.3	6.9	6.1	8.3	6.2	6.7	5.7	6.9	6.6	6.6	6.4	7.3	7.2	7.9	6.8	6.0	7.4
10-Jan-06	7	9:00	4	8.7	7.8	6.4	7.9	8.3	8.7	7.0	6.6	6.7	7.8	7.1	8.6	7.9	7.7	8.2	8.7	6.7	8.1
10-Jan-06	7	9:00	7	8.3	6.4	7.8	8.0	8.9	8.3	6.7	7.0	7.8	7.5	7.9	6.9	7.3	7.6	7.7	7.1	7.1	8.2
10-Jan-06	7	15:30	3	6.7	7.0	6.9	6.4	6.4	6.5	7.2	5.5	5.8	5.2	6.2	6.3	7.3	5.7	6.1	6.3	5.2	6.2
10-Jan-06	7	15:30	4	6.8	6.7	7.0	6.1	6.5	6.4	5.7	5.3	5.7	5.9	5.9	6.3	6.9	6.3	6.9	5.9	5.2	6.2
11-Jan-06	8	8:30	4	8.0	6.8	6.5	6.1	7.8	8.0	5.7	5.5	5.0	6.3	6.3	5.5	7.6	6.2	7.7	7.9	6.2	7.5
11-Jan-06	8	8:30	6	7.9	5.7	5.4	7.0	7.1	7.8	6.0	4.4	6.7	4.7	6.4	6.1	7.0	6.4	7.8	7.1	4.8	7.0
11-Jan-06	8	15:00	4	7.3	6.7	6.2	6.4	6.9	7.3	6.6	5.8	7.1	6.5	6.4	5.7	7.2	7.5	7.8	7.9	7.1	8.4
11-Jan-06	8	15:00	8	6.9	7.0	7.3	6.6	7.0	7.4	6.5	6.3	7.1	6.6	6.4	6.0	7.3	7.4	7.9	7.9	7.3	7.9
12-Jan-06	9	8:30	4	6.6	6.6	5.8	5.9	6.5	6.3	6.3	5.4	6.0	5.9	5.7	4.5	6.5	5.5	6.2	6.2	5.4	6.3
12-Jan-06	9	8:30	6	6.8	6.6	5.8	6.7	5.9	6.0	6.0	4.9	5.9	4.7	6.0	5.5	6.1	6.0	6.0	6.0	3.7	6.1
12-Jan-06	9	14:00	4	6.2	6.5	6.1	8.0	8.1	7.2	7.2	7.4	6.2	6.6	6.1	7.1	7.1	6.7	7.4	7.4	6.6	6.8
12-Jan-06	9	14:00	8	6.6	6.6	6.4	7.2	7.6	7.7	7.7	6.5	6.3	5.6	5.6	6.6	6.6	6.8	7.5	7.5	5.5	6.1
13-Jan-06	10	7:50	1	6.6	6.6	6.5	6.5	6.2	6.0	6.0	6.6	6.9	5.4	6.1	6.2	6.4	4.6	7.0	7.0	6.5	6.2
13-Jan-06	10	7:50	2	6.3	6.5	6.0	6.3	7.0	5.9	5.9	6.2	6.9	5.4	6.2	6.7	6.4	5.2	6.5	6.5	6.2	6.5
13-Jan-06	10	7:50	3	6.4	6.6	6.5	6.1	7.0	6.2	6.2	6.0	6.4	6.5	6.0	6.5	7.0	5.5	6.8	6.8	6.1	6.4
13-Jan-06	10	7:50	4	6.8	6.6	6.0	6.0	6.1	6.4	6.4	6.2	6.9	6.0	6.0	6.6	6.7	6.4	7.0	7.0	6.3	6.2
13-Jan-06	10	7:50	5	6.6	5.7	6.6	6.3	6.5	6.1	6.1	5.6	7.2	4.4	5.5	4.9	5.5	5.6	6.6	6.6	4.5	6.0
13-Jan-06	10	7:50	6	7.0	6.4	6.1	6.3	6.6	6.8	6.8	5.6	6.4	4.9	6.4	6.6	6.0	5.9	6.8	6.8	4.3	6.3
13-Jan-06	10	7:50	7	6.8	6.6	6.3	6.3	7.2	6.0	6.0	4.7	6.5	5.5	6.2	5.8	6.1	6.0	6.4	6.4	5.9	5.8
13-Jan-06	10	7:50	8	6.8	7.1	5.9	6.3	6.5	6.5	6.5	6.4	5.7	5.8	5.8	6.2	5.8	6.4	6.4	6.4	4.9	6.2
			Average	**7.3**	**7.0**	**6.8**	**6.7**	**6.9**	**6.5**	**6.8**	**6.3**	**6.7**	**6.4**	**6.6**	**6.4**	**6.6**	**6.4**	**7.1**	**7.1**	**6.3**	**6.7**
			Minimum	6.2	5.7	5.4	5.5	3.2	3.8	5.7	4.4	4.6	4.4	4.6	4.5	4.5	4.3	4.0	5.2	3.7	2.9
			Maximum	9.3	8.8	8.3	8.4	9.1	8.7	8.1	8.6	7.9	8.2	8.9	8.6	8.1	8.1	9.1	8.8	8.2	9.2

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006.

pH

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	12.5% SQT1 w/ leafs	25% SQT1	25% SQT1 w/ leafs	50% SQT1	50% SQT1 w/ leafs	100% SQT 1	100% SQT1 w/ leafs	SQT2	SQT4	SQT5	SQT8
3-Jan-06	0	7:00	1	8.11	7.99	7.95	7.42	7.22	6.85	7.56	7.78	7.54	7.37	7.68	7.43	7.85	6.97	7.63	6.80	7.79	7.27
3-Jan-06	0	7:00	4	8.14	8.07	7.92	7.43	7.17	7.09	7.49	7.89	7.61	7.43	7.93	7.45	7.44	7.38	7.79	6.84	7.88	7.13
3-Jan-06	0	7:00	5	8.15	8.13	7.82	7.54	7.89	6.72	7.71	7.69	7.75	7.77	7.41	7.52	7.27	7.88	7.78	7.08	7.70	7.02
3-Jan-06	0	7:00	8	8.15	8.14	7.90	7.66	7.77	7.84	7.90	7.89	7.51	7.66	7.60	7.50	7.76	7.89	7.58	7.47	7.81	7.70
13-Jan-06	10	7:05	1	8.12	8.15	7.79	7.98	8.04	7.55	7.68	8.00	7.62	7.50	7.58	7.56	7.96	7.54	7.72	8.00	7.71	7.93
13-Jan-06	10	7:05	4	8.10	8.17	7.53	7.75	7.71	7.56	7.63	7.82	7.70	7.63	7.57	7.64	7.90	7.71	8.01	8.01	7.82	7.72
13-Jan-06	10	7:05	5	8.17	7.82	7.74	7.92	8.07	7.55	7.45	7.50	7.79	7.38	7.53	7.48	7.54	7.65	7.84	7.71	7.45	7.93
13-Jan-06	10	7:05	8	8.17	8.19	7.78	8.02	7.98	7.90	7.70	7.93	7.58	7.91	7.56	7.71	7.77	7.74	7.77	7.83	7.46	7.75
			Average	**8.14**	**8.08**	**7.80**	**7.72**	**7.73**	**7.38**	**7.64**	**7.81**	**7.64**	**7.58**	**7.61**	**7.54**	**7.69**	**7.60**	**7.77**	**7.47**	**7.70**	**7.56**
			Minimum	8.10	7.82	7.53	7.42	7.17	6.72	7.45	7.50	7.51	7.37	7.41	7.43	7.27	6.97	7.58	6.80	7.45	7.02
			Maximum	8.17	8.19	7.95	8.02	8.07	7.90	7.90	8.00	7.79	7.91	7.93	7.71	7.96	7.89	8.01	8.01	7.88	7.93

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	12.5% SQT1 w/ leafs	25% SQT1	25% SQT1 w/ leafs	50% SQT1	50% SQT1 w/ leafs	100% SQT 1	100% SQT1 w/ leafs	SQT2	SQT4	SQT5	SQT8
3-Jan-06	0	7:00	1	149	147	144	159	163	136	155	148	143	151	150	150	146	151	148	151	148	153
3-Jan-06	0	7:00	8	148	146	142	151	150	137	151	147	151	145	146	148	145	149	147	155	148	150
13-Jan-06	10	7:05	1	136	133	132	135	136	130	137	137	139	142	140	141	133	136	138	134	133	133
13-Jan-06	10	7:05	8	135	132	130	135	135	130	137	137	141	140	135	138	132	133	138	135	137	132
			Average	**142**	**139**	**137**	**145**	**146**	**133**	**145**	**142**	**144**	**144**	**143**	**144**	**139**	**142**	**143**	**144**	**141**	**142**
			Minimum	135	132	130	135	135	130	137	137	139	140	135	138	132	133	138	134	133	132
			Maximum	149	147	144	159	163	137	155	148	151	151	150	150	146	151	148	155	148	153

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006.
Ammonia (ppm)

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	12.5% SQT1 w/ leafs	25% SQT1	25% SQT1 w/ leafs	50% SQT1	50% SQT1 w/ leafs	100% SQT 1	100% SQT1 w/ leafs	SQT2	SQT4	SQT5	SQT8
3-Jan-06	0	7:00	1	<0.063	<0.063	0.143	0.327	0.816	<0.063	0.178	0.155	0.225	0.261	0.185	0.162	0.095	0.317	<0.063	<0.063	<0.063	<0.063
3-Jan-06	0	7:00	8	<0.063	<0.063	0.148	0.151	0.290	<0.063	0.127	0.116	0.217	0.136	0.133	0.224	0.065	0.205	<0.063	<0.063	<0.063	<0.063
13-Jan-06	10	7:05	1	0.248	0.106	0.107	0.277	0.292	0.148	0.252	0.267	0.312	0.442	0.439	0.361	0.161	0.353	0.100	0.127	0.139	0.130
13-Jan-06	10	7:05	8	0.250	0.102	0.104	0.263	0.258	0.148	0.272	0.251	0.399	0.422	0.252	0.305	0.177	0.207	0.117	0.140	0.173	0.130
			Average	**0.140**	**0.068**	**0.126**	**0.255**	**0.414**	**0.090**	**0.207**	**0.197**	**0.288**	**0.315**	**0.252**	**0.263**	**0.125**	**0.271**	**0.070**	**0.083**	**0.094**	**0.081**
			Minimum	<0.063	<0.063	0.104	0.151	0.258	<0.063	0.127	0.116	0.217	0.136	0.133	0.162	0.065	0.205	<0.063	<0.063	<0.063	<0.063
			Maximum	0.250	0.106	0.148	0.327	0.816	0.148	0.272	0.267	0.399	0.442	0.439	0.361	0.177	0.353	0.117	0.140	0.173	0.130

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006.
DOC (ppm)

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	12.5% SQT1 w/ leafs	25% SQT1	25% SQT1 w/ leafs	50% SQT1	50% SQT1 w/ leafs	100% SQT 1	100% SQT1 w/ leafs	SQT2	SQT4	SQT5	SQT8
13-Jan-06	10	7:05	1	1.7	1.3		1.3	2.1		1.5	1.8	2.4	1.1	4.3	1.7	2.0	2.6	1.9	1.5	2.2	2.3
13-Jan-06	10	7:05	8	2.0		1.2	1.7	1.7	2.1	1.3	1.6	1.8	1.0	1.8	1.8	1.7	1.6	1.9	1.8	4.3	1.8
			Average	**1.9**	**1.3**	**1.2**	**1.5**	**1.9**	**2.1**	**1.4**	**1.7**	**2.1**	**1.1**	**3.1**	**1.8**	**1.9**	**2.1**	**1.9**	**1.7**	**3.3**	**2.1**
			Minimum	1.7	1.3	1.2	1.3	1.7	2.1	1.3	1.6	1.8	1.0	1.8	1.7	1.7	1.6	1.9	1.5	2.2	1.8
			Maximum	2.0	1.3	1.2	1.7	2.1	2.1	1.5	1.8	2.4	1.1	4.3	1.8	2.0	2.6	1.9	1.8	4.3	2.3

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006.
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	12.5% SQT1 w/ leafs	25% SQT1	25% SQT1 w/ leafs	50% SQT1	50% SQT1 w/ leafs	100% SQT 1	100% SQT1 w/ leafs	SQT2	SQT4	SQT5	SQT8
3-Jan-06	0	7:00	3	47.6	47.2	43.2	55.6	64.0		47.2	51.2	65.6	68.0	55.6	56.8	52.0	52.8	63.6	56.0	54.0	62.0
3-Jan-06	0	7:00	7	48.0	46.0	44.4	55.2	74.0	73.6	53.2	64.0	55.6	75.2	68.0	67.2	52.8	49.2	55.2	64.8	56.4	62.0
13-Jan-06	10	7:05	3	50.8	49.6	48.8	48.8	49.6	52.0	53.6	56.0	51.6	49.6	49.2	43.2	49.2	52.4	50.4	56.0	50.4	48.4
13-Jan-06	10	7:05	7	50.0	49.6	46.0	52.8	48.4	48.4	49.6	52.4	52.4	53.6	50.8	52.4	50.4	52.8	52.4	56.4	51.2	47.6
			Average	**49.1**	**48.1**	**45.6**	**53.1**	**59.0**	**58.0**	**50.9**	**55.9**	**56.3**	**61.6**	**55.9**	**54.9**	**51.1**	**51.8**	**55.4**	**58.3**	**53.0**	**55.0**
			Minimum	47.6	46.0	43.2	48.8	48.4	48.4	47.2	51.2	51.6	49.6	49.2	43.2	49.2	49.2	50.4	56.0	50.4	47.6
			Maximum	50.8	49.6	48.8	55.6	74.0	73.6	53.6	64.0	65.6	75.2	68.0	67.2	52.8	52.8	63.6	64.8	56.4	62.0

Appendix Table 13. Water Chemistry Parameters for *H. azteca* Exposed to Ashland Harbor Sediments and a Dilution Series Under UV light, 3 January 2006 to 13 January 2006.
Alaklinty (mg/L as CaCo3)

Date	Day	Time	Rep	Silica Sand	Silica Sand w/ leafs	W. Bearskin	Dilution Sediment	SQT9	SQT11	12.5% SQT1	12.5% SQT1 w/ leafs	25% SQT1	25% SQT1 w/ leafs	50% SQT1	50% SQT1 w/ leafs	100% SQT 1	100% SQT1 w/ leafs	SQT2	SQT4	SQT5	SQT8
3-Jan-06	0	7:00	2	50.4	51.6	48.8	48.4	72		51.2	52.8	54	52.4	50	52.4	59.6	57.6	60.8	55.6	60.8	60.4
3-Jan-06	0	7:00	6	50.4	48.8	47.6	5.08	63.2	50.4	51.6	54.4	50.8	50.4	54.4	52	57.6	55.2	62.8	63.6	62.8	60.4
13-Jan-06	10	7:05	2	56	54.8	52.4	54	55.2	54.4	53.6	56.8	56.4	57.2	59.6	58	56	58.8	58.4	56.8	60	56.8
13-Jan-06	10	7:05	6	57.2	56	53.2	53.6	57.6	55.6	56.8	57.2	59.6	58.8	56.4	58.4	58	54.8	57.2	60	56.4	57.6
			Average	**53.5**	**52.8**	**50.5**	**40.3**	**62.0**	**53.5**	**53.3**	**55.3**	**55.2**	**54.7**	**55.1**	**55.2**	**57.8**	**56.6**	**59.8**	**59.0**	**60.0**	**58.8**
			Minimum	50.4	48.8	47.6	5.1	55.2	50.4	51.2	52.8	50.8	50.4	50.0	52.0	56.0	54.8	57.2	55.6	56.4	56.8
			Maximum	57.2	56.0	53.2	54.0	72.0	55.6	56.8	57.2	59.6	58.8	59.6	58.4	59.6	58.8	62.8	63.6	62.8	60.4

APPENDIX 14

Survival and Growth of *Pimephales promelas* Following 7-d of Exposure to Ashland Harbor Sediments, July 8-18, 2005

Appendix Table 14. Survival and Growth of *Pimephales promelas* Following 7-d of Exposure to Ashland Harbor Sediments, July 8-15, 2005.

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected Mortallity (%)	Number Weighed	Total Dry Wt. (mg)	Individual Dry Wt. (mg)	Average Dry Wt (mg)	Standard Deviation
A	Silica Sand	1	10	100.0			10	5.7	0.57		
A	Silica Sand	2	10	100.0			10	6.1	0.61		
A	Silica Sand	3	8	80.0			8	5.2	0.65		
A	Silica Sand	4	10	100.0			10	7.8	0.78		
A	Silica Sand	5	10	100.0			9	8.4	0.93		
A	Silica Sand	6	9	90.0			9	5.5	0.61		
A	Silica Sand	7	10	100.0			10	7.2	0.72		
A	Silica Sand	8	9	90.0	7.6		9	7.6	0.84	0.71	0.13
B	Form. Sediment	1	9	90.0			9	5.6	0.62		
B	Form. Sediment	2	8	80.0			8	5.2	0.65		
B	Form. Sediment	3	9	90.0			9	5.9	0.66		
B	Form. Sediment	4	10	100.0			10	5.3	0.53		
B	Form. Sediment	5	9	90.0			9	4.7	0.52		
B	Form. Sediment	6	9	90.0			9	5.5	0.61		
B	Form. Sediment	7	10	100.0			10	4.7	0.47		
B	Form. Sediment	8	9	90.0	6.4		9	5.5	0.61	0.58	0.07
C	W. Bearskin	1	8	80.0			8	3.6	0.45		
C	W. Bearskin	2	9	90.0			8	3.8	0.48		
C	W. Bearskin	3	8	80.0			8	4.9	0.61		
C	W. Bearskin	4	7	70.0			7	10	1.43		
C	W. Bearskin	5	10	100.0			10	6.1	0.61		
C	W. Bearskin	6	9	90.0			9	5.2	0.58		
C	W. Bearskin	7	10	100.0			10	6.3	0.63		
C	W. Bearskin	8	5	50.0	16.7		5	3	0.60	0.67	0.31
D	SQT9	1	6	60.0			6	5.3	0.88		
D	SQT9	2	7	70.0			7	6.2	0.89		
D	SQT9	3	9	90.0			9	4.1	0.46		
D	SQT9	4	10	100.0			10	6.1	0.61		
D	SQT9	5	1	10.0			1	0.4	0.40		
D	SQT9	6	7	70.0			7	5.1	0.73		
D	SQT9	7	8	80.0			10	5.5	0.55		
D	SQT9	8	8	80.0	27.3		8	6.6	0.83	0.67	0.19
E	SQT10	1	9	90.0			9	7	0.78		
E	SQT10	2	10	100.0			10	6.2	0.62		
E	SQT10	3	9	90.0			9	9.6	1.07		
E	SQT10	4	10	100.0			10	7.4	0.74		
E	SQT10	5	10	100.0			10	5.7	0.57		
E	SQT10	6	10	100.0			10	8.9	0.89		
E	SQT10	7	10	100.0			10	6.6	0.66		
E	SQT10	8	9	90.0	5.2		9	6.4	0.71	0.75	0.16
F	SQT11	1	9	90.0			9	6.3	0.70		
F	SQT11	2	8	80.0			8	5.4	0.68		
F	SQT11	3	10	100.0			10	6.6	0.66		
F	SQT11	4	10	100.0			10	5.9	0.59		
F	SQT11	5	9	90.0			9	5.2	0.58		
F	SQT11	6	9	90.0			9	5.4	0.60		
F	SQT11	7	9	90.0			9	4.7	0.52		
F	SQT11	8	8	80.0	7.6		9	5.2	0.58	0.61	0.06

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected Mortallity (%)	Number Weighed	Total Dry Wt. (mg)	Individual Dry Wt. (mg)	Average Dry Wt (mg)	Standard Deviation
G	SQT12	1	10	100.0			10	6.9	0.69		
G	SQT12	2	9	90.0			9	4.9	0.54		
G	SQT12	3	10	100.0			9	5.9	0.66		
G	SQT12	4	9	90.0			9	5.6	0.62		
G	SQT12	5	9	90.0			9	6	0.67		
G	SQT12	6	9	90.0			9	5.7	0.63		
G	SQT12	7	10	100.0			10	5.4	0.54		
G	SQT12	8	9	90.0	5.2		9	6	0.67	0.63	0.06
H	SQT6	1	10	100.0		100.1	10	3.4	0.34		
H	SQT6	2	9	90.0		99.9	9	4.8	0.53		
H	SQT6	3	10	100.0		100.1	10	6.8	0.68		
H	SQT6	4	9	90.0		99.9	9	6.7	0.74		
H	SQT6	5	8	80.0		99.8	8	5	0.63		
H	SQT6	6	9	90.0		99.9	9	5.4	0.60		
H	SQT6	7	10	100.0		100.1	10	4.3	0.43		
H	SQT6	8	10	100.0	7.4	100.1	10	5.9	0.59	0.57	0.13
I	SQT2	1	9	90.0		99.9	9	6.5	0.72		
I	SQT2	2	8	80.0		99.8	8	5.5	0.69		
I	SQT2	3	7	70.0		99.7	7	5.2	0.74		
I	SQT2	4	9	90.0		99.9	9	5.1	0.57		
I	SQT2	5	10	100.0		100.1	10	8.2	0.82		
I	SQT2	6	9	90.0		99.9	9	6.3	0.70		
I	SQT2	7	10	100.0		100.1	10	5.3	0.53		
I	SQT2	8	10	100.0	10.7	100.1	10	6.3	0.63	0.67	0.10
J	SQT7	1	10	100.0		100.1	10	5.3	0.53		
J	SQT7	2	9	90.0		99.9	9	4.5	0.50		
J	SQT7	3	8	80.0		99.8	8	3.5	0.44		
J	SQT7	4	9	90.0		99.9	9	5.1	0.57		
J	SQT7	5	10	100.0		100.1	10	5.5	0.55		
J	SQT7	6	9	90.0		99.9	9	6.8	0.76		
J	SQT7	7	8	80.0		99.8	8	4.2	0.53		
J	SQT7	8	9	90.0	7.6	99.9	9	3.9	0.43	0.54	0.10
K	SQT4	1	8	80.0		99.8	8	4.7	0.59		
K	SQT4	2	9	90.0		99.9	9	4.5	0.50		
K	SQT4	3	9	90.0		99.9	9	4.4	0.49		
K	SQT4	4	10	100.0		100.1	10	5.9	0.59		
K	SQT4	5	8	80.0		99.8	8	4.5	0.56		
K	SQT4	6	10	100.0		100.1	10	4.4	0.44		
K	SQT4	7	10	100.0		100.1	10	5.9	0.59		
K	SQT4	8	9	90.0	8.3	99.9	9	5.2	0.58	0.54	0.06
L	SQT3	1	6	60.0		99.6	6	3.3	0.55		
L	SQT3	2	8	80.0		99.8	8	7	0.88		
L	SQT3	3	7	70.0		99.7	7	3	0.43		
L	SQT3	4	9	90.0		99.9	9	5.8	0.64		
L	SQT3	5	10	100.0		100.1	10	5.6	0.56		
L	SQT3	6	10	100.0		100.1	10	6.3	0.63		
L	SQT3	7	9	90.0		99.9	9	4.8	0.53		
L	SQT3	8	7	70.0	14.9	99.7	7	6	0.86	0.63	0.16
M	SQT5	1	9	90.0		99.9	8	5.4	0.68		
M	SQT5	2	10	100.0		100.1	10	7	0.70		
M	SQT5	3	10	100.0		100.1	10	7.1	0.71		
M	SQT5	4	8	80.0		99.8	8	5.4	0.68		
M	SQT5	5	8	80.0		99.8	8	7	0.88		
M	SQT5	6	10	100.0		100.1	9	5.2	0.58		
M	SQT5	7	10	100.0		100.1	10	6.5	0.65		
M	SQT5	8	10	100.0	9.2	100.1	10	8.1	0.81	0.71	0.09

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Standard Deviation	Corrected Mortallity (%)	Number Weighed	Total Dry Wt. (mg)	Individual Dry Wt. (mg)	Average Dry Wt (mg)	Standard Deviation
N	SQT1	1	7	70.0		99.7	7	3.4	0.49		
N	SQT1	2	9	90.0		99.9	9	5.1	0.57		
N	SQT1	3	8	80.0		99.8	8	3.8	0.48		
N	SQT1	4	7	70.0		99.7	7	3.2	0.46		
N	SQT1	5	5	50.0		99.5	5	2.4	0.48		
N	SQT1	6	8	80.0		99.8	8	3.1	0.39		
N	SQT1	7	8	80.0		99.8	8	4.2	0.53		
N	SQT1	8	9	90.0	13.0	99.9	9	3.6	0.40	0.47	0.06
O	SQT8	1	9	90.0		99.9	9	7.3	0.81		
O	SQT8	2	10	100.0		100.1	10	6.2	0.62		
O	SQT8	3	8	80.0		99.8	7	4.4	0.63		
O	SQT8	4	9	90.0		99.9	9	6.5	0.72		
O	SQT8	5	10	100.0		100.1	10	6.7	0.67		
O	SQT8	6	9	90.0		99.9	9	6.6	0.73		
O	SQT8	7	10	100.0		100.1	10	6.4	0.64		
O	SQT8	8	10	100.0	7.4	100.1	10	6	0.60	0.68	0.07

APPENDIX 15

Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ashland Harbor Sediments, July 8-18, 2005

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
Temperature (° C)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	1	22.3	23.0	22.8	22.8	22.8	22.2	22.6	22.3	22.7	22.5	22.4	22.3	22.7	23.0	22.2
8-Jul-05	0	7:30	2	22.3	22.9	22.8	22.7	22.9	22.2	22.7	22.3	22.6	22.6	22.4	22.4	22.8	22.9	22.3
8-Jul-05	0	7:30	3	22.4	22.9	22.9	22.8	22.9	22.2	22.3	22.2	22.7	22.6	22.5	22.4	22.7	22.9	22.4
8-Jul-05	0	7:30	4	22.3	22.8	22.9	22.8	22.9	22.2	22.7	22.2	22.9	22.6	22.6	22.4	22.8	22.9	22.4
8-Jul-05	0	7:30	5	22.5	22.8	22.9	22.9	23.0	22.2	22.7	22.3	22.8	22.5	22.8	22.4	22.8	22.8	22.6
8-Jul-05	0	7:30	6	22.5	22.8	22.9	22.8	22.9	22.2	22.7	22.3	22.8	22.6	22.8	22.4	22.9	22.9	22.5
8-Jul-05	0	7:30	7	22.4	22.7	22.8	22.9	22.9	22.3	22.6	22.3	22.7	22.5	22.7	22.5	23.0	22.8	22.5
8-Jul-05	0	7:30	8	22.5	22.8	22.8	22.8	22.9	22.1	22.7	22.4	22.7	22.4	22.7	22.5	23.0	22.9	22.5
8-Jul-05	0	16:30	1	22.1	23.0	22.8	22.9	23.0	22.4	23.0	22.7	23.0	22.8	23.0	22.7	23.2	23.2	22.8
8-Jul-05	0	16:30	4	22.3	23.1	22.8	22.9	23.0	22.3	22.9	22.7	23.1	22.8	23.0	22.7	23.2	23.2	22.8
9-Jul-05	1	9:00	4	23.1	22.9	23.4	23.0	23.1	23.3	23.2	23.2	23.2	23.2	23.2	23.0	23.1	23.2	23.3
9-Jul-05	1	9:00	6	23.1	22.9	23.4	23.1	23.2	23.3	23.2	23.3	23.3	23.2	23.2	23.2	23.1	23.2	23.3
9-Jul-05	1	18:00	4	23.5	23.4	23.6	23.5	23.6	23.8	23.7	23.7	23.6	23.7	23.5	23.8	23.7	23.7	23.8
9-Jul-05	1	18:00	8	23.5	23.4	23.6	23.5	23.6	23.8	23.8	23.8	23.6	23.7	23.8	23.8	23.7	23.7	23.8
10-Jul-05	2	8:45	4	23.4	23.2	23.4	23.4	23.4	23.6	23.3	23.6	23.4	23.5	23.4	23.5	23.4	23.4	23.5
10-Jul-05	2	8:45	5	23.5	23.3	23.5	23.5	23.5	23.5	23.5	23.6	23.4	23.6	23.4	23.5	23.4	23.5	23.5
10-Jul-05	2	19:00	2	23.8	23.5	23.7	23.8	23.8	24.0	23.9	24.0	23.8	24.0	23.8	24.0	23.9	24.0	24.0
10-Jul-05	2	19:00	4	23.8	23.6	23.8	23.7	23.8	24.1	24.0	24.0	23.9	24.0	24.0	24.1	23.9	24.0	24.0
11-Jul-05	3	7:00	4	23.4	23.1	23.5	23.4	23.5	23.6	23.4	23.6	23.2	23.4	23.5	23.4	23.3	23.4	23.4
11-Jul-05	3	7:00	7	23.3	23.1	23.4	23.1	23.4	23.6	23.5	23.5	23.3	23.3	23.4	23.3	23.3	23.3	23.6
11-Jul-05	3	15:30	3	23.8	23.7	23.9	23.9	24.0	24.0	24.0	23.9	23.9	24.1	23.9	24.0	23.9	24.0	24.0
11-Jul-05	3	15:30	4	23.9	23.7	24.0	24.0	23.9	24.0	24.0	24.0	24.0	24.1	23.9	24.1	23.9	24.0	24.1
12-Jul-05	4	7:00	1	23.4	23.4	23.4	23.6	23.5	23.2	23.5	23.3	23.4	23.5	23.4	23.4	23.5	23.6	23.5
12-Jul-05	4	7:00	4	23.6	23.3	23.1	23.5	23.4	23.3	23.4	23.3	23.6	23.3	23.3	23.6	23.6	23.7	23.6
12-Jul-05	4	15:00	3	24.2	24.1	24.1	24.3	24.2	24.1	23.6	24.1	24.1	24.3	24.2	24.3	24.1	24.2	24.2
12-Jul-05	4	15:00	4	24.4	24.2	24.1	24.3	24.2	24.1	24.2	24.1	24.2	24.3	24.2	24.4	24.2	24.2	24.2
13-Jul-05	5	8:45	4	24.3	24.3	24.3	24.6	24.4	24.3	24.5	24.4	24.4	24.5	24.3	24.4	24.4	24.4	24.4
13-Jul-05	5	8:45	6	24.4	24.4	24.6	24.6	24.5	24.4	24.5	24.5	24.4	24.5	24.3	24.4	24.3	24.3	24.5
13-Jul-05	5	15:00	4	23.6	23.5	23.7	23.9	23.7	23.7	23.7	23.7	23.7	23.8	23.8	24.1	23.8	23.7	23.9
13-Jul-05	5	15:00	8	23.6	23.5	23.8	23.9	23.7	23.7	23.7	23.8	23.7	23.8	23.8	24.0	23.7	23.7	23.9
14-Jul-05	6	8:30	4	23.4	23.3	23.6	23.6	23.4	23.4	23.5	23.4	23.4	23.5	23.5	23.6	23.5	23.4	23.5
14-Jul-05	6	8:30	5	23.4	23.4	23.6	23.6	23.4	23.4	23.5	23.5	23.5	23.6	23.5	23.7	23.4	23.3	23.6
14-Jul-05	6	15:00	2	23.5	23.5	23.6	23.6	23.6	23.6	23.8	23.6	23.7	23.6	23.6	23.8	23.6	23.5	23.7
14-Jul-05	6	15:00	4	23.5	23.5	23.7	23.8	23.6	23.7	23.8	23.6	23.6	23.6	23.6	23.8	23.6	23.5	23.7
15-Jul-05	7	7:00	1	21.7	22.0	22.0	22.1	22.2	21.6	22.1	21.8	22.1	22.1	22.0	22.2	22.1	22.0	21.7
15-Jul-05	7	7:00	2	21.7	22.0	22.0	22.1	22.2	21.7	22.1	21.8	22.1	22.1	22.0	22.2	22.2	22.0	21.8
15-Jul-05	7	7:00	3	21.8	22.0	22.1	22.2	22.2	21.7	22.2	21.9	22.1	22.1	22.1	22.2	22.0	22.0	21.8
15-Jul-05	7	7:00	4	21.8	22.0	22.1	22.2	22.2	21.8	22.2	21.9	22.1	22.1	22.1	22.2	22.1	22.0	21.9
15-Jul-05	7	7:00	5	21.8	22.0	22.1	22.2	22.2	21.7	22.2	21.9	22.1	22.1	22.5	22.2	22.1	22.0	21.9
15-Jul-05	7	7:00	6	21.8	22.0	22.1	22.2	22.3	21.8	22.2	21.9	22.1	22.1	22.1	22.1	22.1	21.9	21.9
15-Jul-05	7	7:00	7	21.8	22.0	22.1	22.2	22.2	21.8	22.2	21.9	22.1	22.1	22.1	22.1	22.1	21.9	21.8
15-Jul-05	7	7:00	8	21.8	22.0	22.1	22.2	22.2	21.8	22.2	21.9	22.1	22.1	22.1	22.1	22.1	21.9	21.9
			Average	**23.0**	**23.1**	**23.2**	**23.2**	**23.2**	**23.0**	**23.2**	**23.1**	**23.2**	**23.2**	**23.2**	**23.2**	**23.2**	**23.2**	**23.1**
			Minimum	21.7	22.0	22.0	22.1	22.2	21.6	22.1	21.8	22.1	22.1	22.0	22.1	22.0	21.9	21.7
			Maximum	24.4	24.4	24.6	24.6	24.5	24.4	24.5	24.5	24.4	24.5	24.3	24.4	24.4	24.4	24.5

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	1	7.6	6.5	6.4	4.6	4.3	6.3	6.2	6.5	7.4	6.7	6.8	7.1	5.9	5.8	6.4
8-Jul-05	0	7:30	2	7.9	6.1	6.9	6.4	4.6	6.0	5.7	6.3	5.9	6.2	6.9	7.8	6.7	5.9	6.4
8-Jul-05	0	7:30	3	7.8	6.8	5.6	5.3	2.9	6.3	7.5	7.0	7.3	7.5	6.6	7.4	7.3	7.2	6.4
8-Jul-05	0	7:30	4	7.9	6.7	6.5	7.4	4.3	5.8	5.8	6.9	7.8	7.2	7.0	7.8	7.1	7.5	6.5
8-Jul-05	0	7:30	5	7.2	5.9	6.0	5.8	6.6	5.6	6.3	7.6	6.6	7.0	7.9	7.2	6.2	6.5	6.6
8-Jul-05	0	7:30	6	7.3	6.2	5.5	4.3	2.6	5.5	5.7	7.7	6.8	7.2	6.7	7.8	6.2	5.9	7.2
8-Jul-05	0	7:30	7	7.0	6.0	5.9	7.4	5.6	5.3	6.4	6.5	5.1	5.8	7.4	6.9	7.8	6.3	6.6
8-Jul-05	0	7:30	8	7.0	6.1	5.9	3.7	5.5	6.0	7.7	7.4	6.8	6.8	7.7	7.8	8.0	7.5	7.3
8-Jul-05	0	16:30	1	7.5	7.1	6.0	5.4	4.1	5.4	6.9	5.7	6.9	6.2	6.5	6.3	5.0	6.8	5.6
8-Jul-05	0	16:30	4	7.2	6.5	6.4	5.6	5.9	5.4	6.3	5.7	7.3	6.4	6.6	6.6	5.8	7.0	6.1
9-Jul-05	1	9:00	4	6.4	6.3	6.4	6.1	5.9	4.9	4.5	5.6	6.4	5.6	6.6	6.7	4.8	6.3	3.1
9-Jul-05	1	9:00	6	6.2	4.0	4.2	6.2	5.9	4.9	4.2	6.0	4.5	4.4	6.7	5.9	6.9	6.4	3.4
9-Jul-05	1	18:00	4	6.5	6.1	7.0	6.2	6.5	5.7	5.9	6.0	5.1	6.1	6.2	6.0	6.1	6.5	3.5
9-Jul-05	1	18:00	8	6.2	5.2	6.6	5.7	5.8	6.5	6.0	6.2	6.2	6.0	6.6	6.3	6.6	5.1	5.9
10-Jul-05	2	8:45	4	6.5	6.8	6.6	6.4	6.0	3.6	5.9	6.3	6.6	6.3	6.2	5.2	4.0	6.3	3.7
10-Jul-05	2	8:45	5	5.9	4.0	5.8	6.2	5.4	3.7	6.3	6.4	5.9	5.2	6.3	4.2	5.6	6.3	2.5
10-Jul-05	2	19:00	2	6.9	5.8	6.9	6.1	6.1	4.1	4.5	6.5	6.1	6.4	6.6	6.4	5.4	6.5	4.0
10-Jul-05	2	19:00	4	6.8	6.6	6.8	6.3	5.9	4.0	6.3	6.7	6.6	6.5	6.4	6.1	4.0	6.5	4.8
11-Jul-05	3	7:00	4	6.6	6.7	6.7	5.0	5.6	5.0	5.9	6.0	6.1	6.4	6.3	5.0	4.6	6.1	5.0
11-Jul-05	3	7:00	7	6.6	4.1	6.3	4.8	6.5	4.7	6.1	6.3	6.4	6.1	6.5	5.8	6.1	6.0	4.7
11-Jul-05	3	15:30	3	6.4	6.6	6.6	6.5	5.3	5.7	6.6	6.5	6.1	6.4	6.8	6.4	4.4	6.4	4.3
11-Jul-05	3	15:30	4	6.4	6.6	6.5	4.1	5.4	4.2	6.0	6.1	6.4	6.1	6.6	6.1	4.1	6.6	6.4
12-Jul-05	4	7:00	1	6.4	5.8	5.6	5.5	4.5	6.8	6.5	6.1	6.4	6.6	5.7	6.4	6.1	6.1	5.4
12-Jul-05	4	7:00	4	6.5	6.1	5.4	5.9	4.9	6.4	6.6	6.4	6.2	7.0	6.7	6.6	4.9	6.5	6.2
12-Jul-05	4	15:00	3	6.2	6.4	6.3	5.9	3.4	6.2	6.4	6.5	6.5	6.3	5.3	6.1	3.6	6.2	5.1
12-Jul-05	4	15:00	4	6.4	5.5	6.2	5.6	3.2	6.1	6.2	6.4	6.1	6.3	5.6	5.7	4.8	6.1	6.0
13-Jul-05	5	8:45	4	5.8	5.9	6.7	5.8	5.2	6.8	6.4	6.4	6.1	6.2	5.5	5.9	4.9	5.4	5.6
13-Jul-05	5	8:45	6	4.1	5.1	4.5	3.4	3.6	4.6	4.1	5.2	5.6	4.5	6.3	6.6	6.3	6.2	4.8
13-Jul-05	5	15:00	4	6.3	6.4	6.5	4.2	5.8	6.4	6.6	6.3	5.9	6.3	6.0	4.9	5.2	6.4	5.5
13-Jul-05	5	15:00	8	5.1	5.8	6.3	5.1	5.3	6.4	6.4	6.4	5.3	6.2	6.4	6.2	6.3	6.3	5.7
14-Jul-05	6	8:30	4	6.7	6.1	6.0	5.5	4.7	6.3	6.3	6.1	5.9	5.4	5.9	4.1	5.1	5.8	6.0
14-Jul-05	6	8:30	5	5.5	5.4	4.0	5.6	5.8	5.6	3.3	5.3	5.4	5.1	6.0	4.1	5.7	6.2	5.3
14-Jul-05	6	15:00	2	7.2	6.1	6.5	4.6	5.4	6.2	4.4	6.5	5.6	6.0	6.4	6.3	4.6	5.6	6.2
14-Jul-05	6	15:00	4	6.8	6.3	6.3	4.1	4.6	5.2	5.6	6.3	5.9	6.1	6.3	6.2	5.0	5.7	6.3
15-Jul-05	7	7:00	1	7.0	7.0	6.8	5.3	5.0	6.2	6.5	6.5	6.5	6.4	6.7	5.6	3.8	6.3	4.3
15-Jul-05	7	7:00	2	7.2	6.8	6.6	4.0	5.9	6.3	4.3	6.6	6.6	5.8	6.0	5.6	3.7	6.3	5.4
15-Jul-05	7	7:00	3	7.2	6.7	6.6	5.9	6.0	5.6	6.4	6.5	6.4	6.7	6.7	6.3	5.5	6.1	3.9
15-Jul-05	7	7:00	4	7.6	7.0	6.5	3.8	6.4	5.6	6.5	6.7	6.1	6.0	6.5	6.2	5.1	6.0	5.9
15-Jul-05	7	7:00	5	6.4	6.6	6.6	4.4	6.5	6.4	4.6	5.8	6.2	5.1	6.1	5.5	5.4	6.4	5.1
15-Jul-05	7	7:00	6	7.0	5.4	6.0	5.1	5.6	4.3	4.8	5.9	5.5	4.5	6.3	6.0	6.1	6.7	5.6
15-Jul-05	7	7:00	7	6.8	6.5	6.5	6.0	6.1	6.7	6.0	6.4	6.5	5.7	6.5	6.2	6.1	5.8	6.0
15-Jul-05	7	7:00	8	6.6	6.9	6.6	6.1	5.1	7.0	6.9	6.4	5.8	6.0	6.7	6.4	6.8	6.6	4.7
			Average	**6.7**	**6.1**	**6.2**	**5.4**	**5.2**	**5.6**	**5.9**	**6.3**	**6.2**	**6.1**	**6.5**	**6.2**	**5.6**	**6.3**	**5.4**
			Minimum	4.1	4.0	4.0	3.4	2.6	3.6	3.3	5.2	4.5	4.4	5.3	4.1	3.6	5.1	2.5
			Maximum	7.9	7.1	7.0	7.4	6.6	7.0	7.7	7.7	7.8	7.5	7.9	7.8	8.0	7.5	7.3

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
pH

Date	Day	Time	Rep	Sand	orm Sedime	W. Bearskir	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	1	8.11	6.66	7.12	7.02	7.71	7.31	7.32	7.45	7.92	7.61	7.47	7.39	7.64	7.90	7.34
8-Jul-05	0	7:30	4	8.12	7.19	7.19	7.65	7.43	7.28	7.38	7.44	7.91	7.67	7.49	7.57	7.61	7.87	7.36
8-Jul-05	0	7:30	5	8.12	6.58	7.54	7.82	7.86	7.22	7.39	7.74	7.87	7.66	7.61	7.49	7.63	7.83	7.33
8-Jul-05	0	7:30	8	8.12	6.68	7.58	6.97	7.67	7.31	7.37	7.95	7.93	7.61	7.56	7.53	7.64	7.81	7.38
11-Jul-05	3	7:00	4	8.09	8.00	8.00	7.56	7.72	7.41	7.72	7.73	7.94	7.80	8.06	7.76	7.48	7.92	7.25
11-Jul-05	3	7:00	7	8.10	7.91	8.03	7.05	8.01	7.27	7.90	7.93	7.75	7.60	7.96	7.62	7.81	7.87	7.44
15-Jul-05	7	7:00	1	8.70	8.14	8.06	7.60	7.66	7.70	7.96	7.92	7.88	7.87	7.84	7.85	7.53	8.03	7.56
15-Jul-05	7	7:00	4	8.38	8.06	8.06	7.41	7.70	7.58	8.01	8.10	7.73	7.74	7.87	7.82	7.55	7.82	7.79
15-Jul-05	7	7:00	5	7.91	7.98	8.09	7.46	8.05	7.79	7.60	7.78	7.73	7.59	7.85	7.76	7.61	8.01	7.62
15-Jul-05	7	7:00	8	7.95	8.21	8.10	7.70	7.75	8.04	8.10	7.88	7.71	7.83	8.02	7.84	7.90	8.02	7.61
			Average	**8.16**	**7.54**	**7.78**	**7.42**	**7.76**	**7.49**	**7.68**	**7.79**	**7.84**	**7.70**	**7.77**	**7.66**	**7.64**	**7.91**	**7.47**
			Minimum	7.91	6.58	7.12	6.97	7.43	7.22	7.32	7.44	7.71	7.59	7.47	7.39	7.48	7.81	7.25
			Maximum	8.70	8.21	8.10	7.82	8.05	8.04	8.10	8.10	7.94	7.87	8.06	7.85	7.90	8.03	7.79

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Sand	Form Sedimen	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	1	124	175	119	126	138	111	128	117	110	120	119	120	120	118	111
8-Jul-05	0	7:30	8	122	160	119	123	136	110	122	119	109	120	117	119	119	119	116
15-Jul-05	7	7:00	1	179	165	150	157	172	153	157	157	158	156	161	162	168	158	156
15-Jul-05	7	7:00	8	151	165	150	156	172	152	156	156	158	156	159	158	159	156	157
			Average	**144**	**166**	**134**	**140**	**154**	**131**	**141**	**137**	**134**	**138**	**139**	**140**	**141**	**138**	**135**
			Minimum	122	160	119	123	136	110	122	117	109	120	117	119	119	118	111
			Maximum	179	175	150	157	172	153	157	157	158	156	161	162	168	158	157

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
Ammonia (ppm)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	1	<0.063	<0.063	0.169	0.116	0.929	<0.063	0.619	0.181	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
8-Jul-05	0	7:30	8	<0.063	<0.063	0.114	0.116	0.898	<0.063	0.137	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
15-Jul-05	7	7:00	1	0.081	0.066	0.26	0.312	2.245	0.299	0.544	0.159	0.406	0.33	0.348	0.209	0.487	0.282	0.213
15-Jul-05	7	7:00	8	0.09	<0.063	0.277	0.294	2.379	0.321	0.528	0.157	0.413	0.42	0.157	0.217	0.321	0.258	0.234
			Average	**<0.063**	**<0.063**	**0.205**	**0.210**	**1.613**	**0.171**	**0.457**	**0.132**	**0.221**	**0.204**	**0.142**	**0.120**	**0.218**	**0.151**	**0.128**
			Minimum	<0.063	<0.063	0.114	0.116	0.898	<0.063	0.137	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
			Maximum	0.09	0.066	0.277	0.312	2.379	0.321	0.619	0.181	0.413	0.42	0.348	0.217	0.487	0.282	0.234

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
DOC (ppm)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	1	2.4	*	4.3	*	4.6	24.9	4.6	4.4	21.3	6.2	15.3	8.1	6.2	9.6	14.4
8-Jul-05	0	7:30	8	2.8	7.1	3	4.9	3.8	22.6	3.6	3.6	29.4	5.7	11	8.1	6.3	5.2	20.3
15-Jul-05	7	7:00	1	6.6	2.6	2.6	2.6	2.9	3.2	2.3	2.3	3.5	6	3.2	2.5	3.5	3	3.3
15-Jul-05	7	7:00	8	2.4	2.8	2.6	2.6	2.9	3.2	2.1	2.1	3	2.6	2.6	2.6	3.1	16.3	3.5
			Average	**3.6**	**4.2**	**3.1**	**3.4**	**3.6**	**13.5**	**3.2**	**3.1**	**14.3**	**5.1**	**8.0**	**5.3**	**4.8**	**8.5**	**10.4**
			Minimum	2.4	2.6	2.6	2.6	2.9	3.2	2.1	2.1	3	2.6	2.6	2.5	3.1	3	3.3
			Maximum	6.6	7.1	4.3	4.9	4.6	24.9	4.6	4.4	29.4	6.2	15.3	8.1	6.3	16.3	20.3

* Sample lost, laboratory accident

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	3	48.8	47.2	48.8	54	57.6	51.6	48	50.8	54.8	47.2	62.8	51.6	53.2	47.2	57.6
8-Jul-05	0	7:30	7	48.8	38.8	48.4	48	55.2	54.8	53.6	49.6	62	56	53.6	52	48.8	51.2	50.4
15-Jul-05	7	7:00	3	46.8	54.8	49.6	53.2	56.4	51.6	51.2	52.4	51.6	51.6	53.2	53.2	57.6	51.2	54
15-Jul-05	7	7:00	7	52.8	58	50	53.2	55.6	49.2	52.4	52	53.2	52.8	52.8	55.2	52.8	508	51.2
			Average	**49.3**	**49.7**	**49.2**	**52.1**	**56.2**	**51.8**	**51.3**	**51.2**	**55.4**	**51.9**	**55.6**	**53.0**	**53.1**	**164.4**	**53.3**
			Minimum	46.8	38.8	48.4	48	55.2	49.2	48	49.6	51.6	47.2	52.8	51.6	48.8	47.2	50.4
			Maximum	52.8	58	50	54	57.6	54.8	53.6	52.4	62	56	62.8	55.2	57.6	508	57.6

Appendix Table 15. Water Chemistry Parameters for 7-d *Pimephales promelas* Exposed to Ahsland Harbor Sediments, July 8-15, 2005.
Alkalinity (mg/L as CaCO3)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
8-Jul-05	0	7:30	2	50.8	47.2	49.2	51.6	59.2	48.8	55.6	51.2	50.4	48.8	47.2	50	52.4	50	52.4
8-Jul-05	0	7:30	6	49.2	44.4	50.4	56.4	65.6	47.6	55.6	48.4	48	48.8	53.2	49.2	52.4	48.4	49.2
15-Jul-05	7	7:00	2	53.2	55.6	50.4	56.8	60.8	52	57.2	54	55.6	54	55.6	55.2	58	55.2	54.4
15-Jul-05	7	7:00	6	54	55.6	48.4	54.4	61.6	52.8	57.2	52.4	55.6	54.4	56.8	55.6	54.8	53.2	54
			Average	**51.8**	**50.7**	**49.6**	**54.8**	**61.8**	**50.3**	**56.4**	**51.5**	**52.4**	**51.5**	**53.2**	**52.5**	**54.4**	**51.7**	**52.5**
			Minimum	49.2	44.4	48.4	51.6	59.2	47.6	55.6	48.4	48	48.8	47.2	49.2	52.4	48.4	49.2
			Maximum	54	55.6	50.4	56.8	65.6	52.8	57.2	54	55.6	54.4	56.8	55.6	58	55.2	54.4

APPENDIX 16

Survival and Growth of *Pimephales promelas* following 7-d Exposure to Ashland Harbor Sediment and UV Light, 27 January 2006 to 3 February 2006

Appendix Table 16. Survival and Growth of *Pimephales promelas* following 7-d Exposure to Ashland Harbor Sediment and UV Light, 27 January 2006 to

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Corrected Mortality (%)	Standard Deviation	Total Dry Wt (mg)	Individual Dry Wt (mg)	Average Dry Wt (mg)	Standard Deviation
A	Silica Sand	1	8	80.0			3.4	0.43		
A	Silica Sand	2	10	100.0			5.1	0.51		
A	Silica Sand	3	8	80.0			4.2	0.53		
A	Silica Sand	4	9	90.0			4.3	0.48		
A	Silica Sand	5	7	70.0			4.2	0.60		
A	Silica Sand	6	6	60.0			4.2	0.70		
A	Silica Sand	7	9	90.0			4.1	0.46		
A	Silica Sand	8	8	80.0		1.2	5.0	0.63	0.54	0.09
B	Form. Sediment	1	7	70.0			3.7	0.53		
B	Form. Sediment	2	7	70.0			4.0	0.57		
B	Form. Sediment	3	7	70.0			4.2	0.60		
B	Form. Sediment	4	4	40.0			2.0	0.50		
B	Form. Sediment	5	9	90.0			5.0	0.56		
B	Form. Sediment	6	10	100.0			6.6	0.66		
B	Form. Sediment	7	9	90.0			4.3	0.48		
B	Form. Sediment	8	6	60.0		1.9	3.9	0.65	0.57	0.07
C	W. Bearskin	1	9	90.0			4.3	0.48		
C	W. Bearskin	2	9	90.0			4.9	0.54		
C	W. Bearskin	3	9	90.0			5.3	0.59		
C	W. Bearskin	4	7	70.0			6.1	0.87		
C	W. Bearskin	5	9	90.0			5.7	0.63		
C	W. Bearskin	6	10	100.0			3.7	0.37		
C	W. Bearskin	7	9	90.0			4.3	0.48		
C	W. Bearskin	8	8	80.0		0.9	5.9	0.74	0.59	0.16
D	SQT9	1	8	80.0			6.8	0.85		
D	SQT9	2	9	90.0			6.7	0.74		
D	SQT9	3	10	100.0			5.2	0.52		
D	SQT9	4	8	80.0			5.2	0.65		
D	SQT9	5	5	50.0			3.4	0.68		
D	SQT9	6	10	100.0			6.2	0.62		
D	SQT9	7	7	70.0			4.8	0.69		
D	SQT9	8	9	90.0		1.7	5.3	0.59	0.67	0.10
E	SQT13	1	6	60.0			4.4	0.73		
E	SQT13	2	8	80.0			5.2	0.65		
E	SQT13	3	9	90.0			4.3	0.48		
E	SQT13	4	7	70.0			2.5	0.36		
E	SQT13	5	10	100.0			4.1	0.41		
E	SQT13	6	8	80.0			5.3	0.66		
E	SQT13	7	7	70.0			2.5	0.36		
E	SQT13	8	8	80.0		1.2	5.3	0.66	0.54	0.15
F	SQT11	1	7	70.0			4.8	0.69		
F	SQT11	2	7	70.0			4.4	0.63		
F	SQT11	3	8	80.0			6.5	0.81		
F	SQT11	4	6	60.0			4.4	0.73		
F	SQT11	5	8	80.0			4.3	0.54		
F	SQT11	6	8	80.0			4.4	0.55		
F	SQT11	7	7	70.0			3.0	0.43		
F	SQT11	8	8	80.0		0.7	6.2	0.78	0.64	0.13
G	SQT14	1	8	80.0			5.7	0.71		
G	SQT14	2	6	60.0			3.9	0.65		
G	SQT14	3	11	110.0			6.7	0.61		
G	SQT14	4	7	70.0			5.0	0.71		
G	SQT14	5	9	90.0			5.7	0.63		
G	SQT14	6	6	60.0			4.1	0.68		
G	SQT14	7	7	70.0			5.0	0.71		
G	SQT14	8	11	110.0		2.0	7.3	0.66	0.67	0.04
H	SQT6	1	8	80.0	100.0		4.0	0.50		
H	SQT6	2	8	80.0	100.0		4.5	0.56		
H	SQT6	3	10	100.0	100.2		7.1	0.71		
H	SQT6	4	8	80.0	100.0		5.1	0.64		

Treatment	Test Sediment	Rep	Number of Survivors (10)	Average Survival (%)	Corrected Mortality (%)	Standard Deviation	Total Dry Wt (mg)	Individual Dry Wt (mg)	Average Dry Wt (mg)	Standard Deviation
H	SQT6	5	5	50.0	99.6		3.4	0.68		
H	SQT6	6	6	60.0	99.7		4.6	0.77		
H	SQT6	7	10	100.0	100.2		5.6	0.56		
H	SQT6	8	7	70.0	99.9	1.8	4.0	0.57	0.62	0.09
I	SQT2	1	8	80.0	100.0		4.8	0.60		
I	SQT2	2	6	60.0	99.7		3.7	0.62		
I	SQT2	3	9	90.0	100.1		5.6	0.62		
I	SQT2	4	5	50.0	99.6		2.4	0.48		
I	SQT2	5	9	90.0	100.1		5.6	0.62		
I	SQT2	6	9	90.0	100.1		4.0	0.44		
I	SQT2	7	5	50.0	99.6		2.9	0.58		
I	SQT2	8	9	90.0	100.1	1.9	4.5	0.50	0.56	0.07
J	SQT7	1	3	30.0	99.4		1.7	0.57		
J	SQT7	2	7	70.0	99.9		3.7	0.53		
J	SQT7	3	5	50.0	99.6		2.3	0.46		
J	SQT7	4	0	0.0	99.0					
J	SQT7	5	4	40.0	99.5		2.9	0.73		
J	SQT7	6	5	50.0	99.6		2.8	0.56		
J	SQT7	7	2	20.0	99.2		2.0	1.00		
J	SQT7	8	5	50.0	99.6	2.2	2.8	0.56	0.63	0.18
K	SQT4	1	5	50.0	99.6		2.3	0.46		
K	SQT4	2	7	70.0	99.9		3.7	0.53		
K	SQT4	3	6	60.0	99.7		3.7	0.62		
K	SQT4	4	4	40.0	99.5		2.8	0.70		
K	SQT4	5	8	80.0	100.0		3.8	0.48		
K	SQT4	6	6	60.0	99.7		3.0	0.50		
K	SQT4	7	8	80.0	100.0		3.1	0.39		
K	SQT4	8	5	50.0	99.6	1.5	1.8	0.36	0.50	0.11
L	SQT3	1	10	100.0	100.2		3.2	0.32		
L	SQT3	2	6	60.0	99.7		3.1	0.52		
L	SQT3	3	6	60.0	99.7		1.7	0.28		
L	SQT3	4	10	100.0	100.2		5.6	0.56		
L	SQT3	5	2	20.0	99.2		0.9	0.45		
L	SQT3	6	8	80.0	100.0		4.4	0.55		
L	SQT3	7	4	40.0	99.5		1.6	0.40		
L	SQT3	8	9	90.0	100.1	2.9	5.0	0.56	0.45	0.11
M	SQT5	1	4	40.0	99.5		2.4	0.60		
M	SQT5	2	6	60.0	99.7		2.9	0.48		
M	SQT5	3	5	50.0	99.6		3.9	0.78		
M	SQT5	4	7	70.0	99.9		3.9	0.56		
M	SQT5	5	5	50.0	99.6		3.0	0.60		
M	SQT5	6	6	60.0	99.7		3.0	0.50		
M	SQT5	7	6	60.0	99.7		3.6	0.60		
M	SQT5	8	9	90.0	100.1	1.5	4.6	0.51	0.58	0.09
N	SQT 1	1	0	0.0	99.0					
N	SQT 1	2	0	0.0	99.0					
N	SQT 1	3	0	0.0	99.0					
N	SQT 1	4	0	0.0	99.0					
N	SQT 1	5	0	0.0	99.0					
N	SQT 1	6	0	0.0	99.0					
N	SQT 1	7	0	0.0	99.0					
N	SQT 1	8	0	0.0	99.0	0.0				
O	SQT8	1	8	80.0	100.0		5.0	0.63		
O	SQT8	2	6	60.0	99.7		4.3	0.72		
O	SQT8	3	8	80.0	100.0		3.9	0.49		
O	SQT8	4	6	60.0	99.7		3.5	0.58		
O	SQT8	5	7	70.0	99.9		4.7	0.67		
O	SQT8	6	5	50.0	99.6		3.3	0.66		
O	SQT8	7	9	90.0	100.1		5.8	0.64		
O	SQT8	8	8	80.0	100.0	1.4	4.2	0.53	0.61	0.08

APPENDIX 17

Water Chemistry of *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 3 February 2006

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
Temperature (° C)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	1	23.2	23.0	23.3	23.2	23.3	23.3	23.0	23.2	23.1	23.2	23.1	23.3	23.2	23.2	23.1
27-Jan-06	0	7:00	2	23.4	23.1	23.4	23.5	23.3	23.4	23.1	23.3	23.1	23.2	23.4	23.3	23.1	23.2	23.2
27-Jan-06	0	7:00	3	23.4	23.0	23.4	23.3	23.3	23.3	23.1	23.3	23.1	23.3	23.1	23.2	23.1	23.3	23.3
27-Jan-06	0	7:00	4	23.4	23.0	23.4	23.4	23.3	23.4	23.0	23.4	23.1	23.2	23.1	23.2	23.2	23.3	23.3
27-Jan-06	0	7:00	5	23.3	22.8	23.4	23.2	23.3	23.4	23.3	23.2	23.3	23.4	23.1	23.2	23.1	23.1	23.3
27-Jan-06	0	7:00	6	23.3	23.0	23.3	23.3	23.3	23.4	23.3	23.3	23.3	23.3	23.2	23.0	23.3	23.2	23.3
27-Jan-06	0	7:00	7	23.7	22.7	23.4	23.2	23.2	23.4	23.3	23.2	23.4	23.3	23.2	23.3	23.2	23.3	23.3
27-Jan-06	0	7:00	8	23.3	22.8	23.3	23.4	23.2	23.3	23.3	23.2	23.3	23.3	23.2	23.2	23.2	23.3	23.4
28-Jan-06	1	8:15	4	23.3	23.1	23.5	23.3	22.3	23.5	23.1	23.3	23.4	23.3	23.0	23.0	23.0	23.3	23.4
28-Jan-06	1	8:15	6	23.3	23.0	23.6	23.3	22.3	23.5	23.1	23.7	23.4	23.5	23.3	23.2	23.2	23.4	23.5
28-Jan-06	1	15:45	4	23.5	22.9	23.3	23.5	23.2	23.4	23.5	23.4	23.2	23.4	23.1	23.1	23.1	23.4	23.4
28-Jan-06	1	15:45	8	23.5	23.0	23.6	23.5	23.0	23.5	23.5	23.5	23.5	23.4	23.2	23.2	23.3	23.4	23.4
29-Jan-06	2	8:45	4	23.3	23.3	23.5	23.2	23.1	23.1	23.3	23.2	23.0	23.4	23.0	23.2	23.1	23.3	23.3
29-Jan-06	2	8:45	5	23.4	23.3	23.6	23.3	23.2	23.2	23.3	23.4	23.4	23.6	23.0	23.4	23.0	23.5	23.1
29-Jan-06	2	17:45	2	23.3	23.3	23.4	23.2	23.1	22.9	22.8	23.0	23.2	23.1	23.1	23.2	23.3	23.3	23.3
29-Jan-06	2	17:45	4	23.2	23.3	23.4	23.3	23.2	22.9	23.0	23.2	23.3	23.3	23.1	23.2	23.4	23.3	23.4
30-Jan-06	3	9:00	4	23.1	23.5	23.2	23.3	23.0	23.4	23.1	23.3	23.5	23.3	23.4	23.2	23.4	23.3	23.4
30-Jan-06	3	9:00	7	23.0	23.5	23.2	23.4	23.1	23.4	23.1	23.3	23.6	23.4	23.3	23.2	23.4	23.4	23.2
30-Jan-06	3	15:10	3	23.6	23.8	23.7	23.6	23.8	23.6	23.0	23.7	24.0	23.7	23.5	23.6	23.5	23.6	23.6
30-Jan-06	3	15:10	4	23.7	23.8	23.8	23.8	23.8	23.8	23.7	23.7	24.0	23.8	23.5	23.7	23.6	23.6	23.6
31-Jan-06	4	8:30	1	23.2	23.4	23.1	23.2	23.0	23.0	23.2	23.3	23.4	23.3	23.0	23.2	22.8	23.4	23.4
31-Jan-06	4	8:30	4	23.3	23.2	23.1	23.3	23.1	23.2	23.3	23.4	23.0	23.3	23.0	23.3	23.2	23.5	23.4
31-Jan-06	4	15:30	3	23.2	23.2	23.0	23.6	23.8	23.2	23.3	23.3	23.2	23.3	23.3	23.5	22.5	23.1	23.5
31-Jan-06	4	15:30	4	23.3	23.2	23.3	23.7	23.5	23.2	23.5	23.3	23.5	23.3	23.3	23.6	22.5	23.3	23.5
1-Feb-06	5	8:30	4	23.2	23.4	23.5	22.9	23.6	23.2	23.3	23.3	23.2	23.4	23.0	23.3	22.8	22.9	23.4
1-Feb-06	5	8:30	6	23.3	23.2	23.4	23.1	23.5	23.2	23.4	23.2	23.4	23.5	23.1	23.3	23.3	23.4	23.4
1-Feb-06	5	15:00	4	23.2	23.7	23.6	23.7	23.3	23.3	23.5	23.5	23.1	23.4	23.2	23.6	23.0	23.4	23.5
1-Feb-06	5	15:00	8	23.2	23.5	23.6	23.6	23.5	23.5	23.4	23.2	23.6	23.5	23.2	23.6	23.2	23.3	23.0
2-Feb-06	6	8:20	4	23.0	23.7	23.5	23.7	22.6	23.2	23.4	23.7	23.5	23.5	23.3	23.4	23.4	23.5	23.5
2-Feb-06	6	8:20	5	23.1	23.6	23.6	23.7	23.7	23.4	23.5	23.7	23.5	23.8	23.3	23.6	23.5	23.5	23.5
2-Feb-06	6	8:20	2	23.0	23.7	23.1	22.9	23.6	23.0	23.3	23.3	23.5	23.1	23.2	23.2	23.2	23.4	23.6
2-Feb-06	6	8:20	4	23.1	23.3	23.3	23.1	23.4	23.2	23.3	23.3	23.6	23.3	23.3	23.3	23.2	23.5	23.5
3-Feb-06	7	7:00	1	21.5	23.4	23.2	23.3	23.5	23.4	23.2	23.3	23.3	23.3	23.0	23.3	23.0	23.1	23.3
3-Feb-06	7	7:00	2	23.2	23.5	23.4	23.4	23.5	23.4	23.2	23.3	23.3	23.3	23.0	23.4	23.1	23.3	23.2
3-Feb-06	7	7:00	3	23.1	23.4	23.4	23.4	23.6	23.4	23.4	23.4	23.4	23.3	23.1	23.5	23.2	23.3	23.2
3-Feb-06	7	7:00	4	23.2	23.5	23.4	23.4	23.6	23.4	23.4	23.5	23.4	23.3	23.1	23.4	23.2	23.4	23.3
3-Feb-06	7	7:00	5	23.1	23.4	23.4	23.5	23.5	23.3	23.4	23.5	23.5	23.5	23.2	23.3	23.3	23.2	23.2
3-Feb-06	7	7:00	6	23.1	23.5	23.3	23.5	23.5	23.4	23.4	23.5	23.4	23.4	23.0	23.4	23.2	23.4	23.2
3-Feb-06	7	7:00	7	23.1	23.4	23.3	23.4	23.5	23.3	23.3	23.5	23.5	23.4	23.1	23.4	23.1	23.2	23.2
3-Feb-06	7	7:00	8	23.1	23.4	23.4	23.4	23.4	23.4	23.4	23.5	23.6	23.4	23.0	23.4	23.2	23.3	23.3
			Average	**23.2**	**23.3**	**23.4**	**23.4**	**23.3**	**23.3**	**23.3**	**23.4**	**23.4**	**23.4**	**23.2**	**23.3**	**23.2**	**23.3**	**23.3**
			Minimum	21.5	22.7	23.0	22.9	22.3	22.9	22.8	23.0	23.0	23.1	23.0	23.0	22.5	22.9	23.0
			Maximum	23.7	23.8	23.8	23.8	23.8	23.8	23.7	23.7	24.0	23.8	23.5	23.7	23.6	23.6	23.6

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	1	7.5	7.1	6.9	3.5	3.9	7.9	4.4	7.3	3.0	8.0	6.1	7.9	7.6	5.9	7.5
27-Jan-06	0	7:00	2	7.7	7.3	6.2	5.6	3.3	7.8	5.2	8.2	3.2	7.6	6.1	8.3	7.6	6.2	6.0
27-Jan-06	0	7:00	3	7.9	7.2	6.8	4.8	4.8	7.0	4.9	6.5	4.4	8.1	6.1	7.2	7.7	6.1	8.0
27-Jan-06	0	7:00	4	7.8	7.7	6.5	4.8	3.6	6.3	6.8	7.2	3.2	7.4	6.5	6.0	7.5	5.4	7.3
27-Jan-06	0	7:00	5	8.2	7.3	7.1	4.4	3.9	5.8	7.7	7.0	4.1	7.5	6.9	8.1	8.2	6.8	3.7
27-Jan-06	0	7:00	6	7.5	8.3	7.1	4.4	5.2	5.4	5.6	7.4	4.7	7.0	8.3	5.2	5.7	7.7	5.4
27-Jan-06	0	7:00	7	7.6	7.3	6.8	4.5	4.3	6.0	7.3	7.8	7.7	8.0	8.2	7.7	6.5	7.7	6.5
27-Jan-06	0	7:00	8	7.5	7.6	7.2	6.4	4.2	6.6	7.1	7.8	6.2	7.2	8.2	7.7	5.3	7.2	7.5
28-Jan-06	1	8:15	4	7.5	6.7	8.4	8.9	8.2	6.4	8.6	6.8	6.6	7.3	6.7	8.2	8.9	8.0	8.5
28-Jan-06	1	8:15	6	7.5	7.2	7.0	8.2	4.8	6.6	6.9	7.8	6.5	7.4	7.3	8.0	8.5	8.3	8.4
28-Jan-06	1	15:45	4	8.2	5.6	6.4	6.9	7.9	5.6	7.9	7.6	8.8	5.9	7.5	9.1	8.0	7.5	8.2
28-Jan-06	1	15:45	8	8.3	4.6	7.8	6.8	5.6	4.9	6.7	8.1	7.4	7.2	7.8	8.1	8.1	8.0	8.3
29-Jan-06	2	8:45	4	7.3	4.2	5.8	8.2	8.0	4.7	7.1	8.7	8.4	7.0	5.2	6.5	8.9	7.2	8.5
29-Jan-06	2	8:45	5	7.9	6.7	6.5	6.5	6.9	4.5	6.0	5.9	8.2	8.3	5.7	7.4	8.8	7.8	7.2
29-Jan-06	2	17:45	2	6.2	6.6	5.0	7.7	7.8	8.5	7.5	8.9	9.0	7.9	7.6	7.9	5.0	5.7	7.2
29-Jan-06	2	17:45	4	5.7	6.7	5.0	7.8	7.6	6.7	6.8	7.8	8.3	7.4	7.0	7.8	4.5	5.6	7.2
30-Jan-06	3	9:00	4	7.3	5.2	5.0	7.0	6.7	6.4	8.0	7.3	6.4	7.7	7.0	6.8	5.9	7.3	6.8
30-Jan-06	3	9:00	7	7.3	4.9	4.7	6.7	4.2	4.1	7.2	5.1	7.3	7.7	8.0	4.4	7.5	8.1	7.0
30-Jan-06	3	15:10	3	4.6	7.3	4.9	5.9	8.1	5.3	4.4	5.3	7.0	6.5	7.6	5.8	7.1	7.9	7.8
30-Jan-06	3	15:10	4	6.7	7.3	5.1	7.8	7.6	4.9	7.3	5.0	7.1	8.0	7.6	6.4	7.0	7.9	8.1
31-Jan-06	4	8:30	1	4.1	4.2	7.1	5.2	4.2	5.8	2.9	7.7	5.0	6.1	5.6	6.2	7.8	5.4	6.7
31-Jan-06	4	8:30	4	6.0	4.3	5.8	6.1	5.6	7.0	5.0	7.0	6.1	7.1	4.0	6.6	7.0	6.6	7.0
31-Jan-06	4	15:30	3	3.6	7.2	8.2	6.1	6.8	6.9	5.0	6.3	6.1	6.8	6.7	6.5	7.8	7.3	6.9
31-Jan-06	4	15:30	4	6.9	7.1	6.7	6.5	7.3	6.8	6.4	6.3	6.6	6.2	5.8	6.6	6.8	6.4	6.8
1-Feb-06	5	8:30	4	5.8	6.7	4.8	5.8	6.2	6.8	5.4	5.7	5.9	4.5	4.4	5.0	6.4	6.0	6.2
1-Feb-06	5	8:30	6	6.1	5.9	5.2	6.3	6.4	7.4	3.4	4.1	4.7	6.3	5.2	6.1	6.4	6.6	6.5
1-Feb-06	5	15:00	4	6.6	6.2	5.0	5.5	6.8	6.7	6.8	5.6	7.5	6.1	6.7	6.1	7.4	6.9	7.4
1-Feb-06	5	15:00	8	6.5	3.8	4.8	5.2	7.1	7.3	2.5	7.3	7.8	7.5	5.6	6.7	7.7	8.1	7.3
2-Feb-06	6	8:20	4	5.1	5.5	4.8	6.1	6.8	6.2	5.4	6.3	6.0	4.3	4.7	5.7	7.4	7.0	7.2
2-Feb-06	6	8:20	5	5.3	3.6	5.5	6.0	6.7	5.6	4.3	5.7	3.7	6.2	3.7	6.6	7.2	7.0	6.5
2-Feb-06	6	8:20	2	6.0	5.5	6.2	5.2	5.9	6.9	6.0	6.4	6.3	6.1	4.6	6.0	6.3	5.7	4.6
2-Feb-06	6	8:20	4	5.8	5.1	4.9	6.0	6.3	6.0	5.9	6.4	6.0	5.3	5.9	6.0	6.9	6.0	4.1
3-Feb-06	7	7:00	1	3.5	3.5	6.4	5.7	6.4	6.3	4.6	4.7	4.7	6.4	6.9	7.6	5.8	6.7	7.2
3-Feb-06	7	7:00	2	4.0	3.8	6.0	5.7	6.2	6.8	4.5	4.8	6.3	6.5	5.9	5.9	5.6	6.0	6.8
3-Feb-06	7	7:00	3	3.8	4.5	4.8	5.4	6.4	6.3	5.6	4.3	6.0	6.6	4.7	6.3	6.0	6.4	6.1
3-Feb-06	7	7:00	4	4.4	4.8	3.6	5.6	6.2	6.4	6.3	4.8	6.2	6.5	4.9	6.3	6.1	6.7	5.8
3-Feb-06	7	7:00	5	4.5	3.8	4.5	6.0	5.7	4.5	6.8	5.6	4.9	6.6	6.1	6.4	6.5	6.6	6.2
3-Feb-06	7	7:00	6	4.2	4.2	5.5	6.3	5.9	6.1	4.7	6.1	5.6	6.2	4.8	6.6	6.3	6.7	6.2
3-Feb-06	7	7:00	7	4.1	3.9	5.2	6.0	5.7	5.3	4.5	6.4	6.3	6.4	5.1	6.5	6.6	6.7	6.3
3-Feb-06	7	7:00	8	4.2	3.9	5.7	5.8	6.0	5.3	4.0	5.9	6.1	6.3	5.0	6.4	6.1	7.0	6.3
			Average	**6.2**	**5.8**	**5.9**	**6.1**	**6.0**	**6.2**	**5.8**	**6.5**	**6.1**	**6.8**	**6.2**	**6.8**	**7.0**	**6.9**	**6.8**
			Minimum	3.5	3.5	3.6	3.5	3.3	4.1	2.5	4.1	3.0	4.3	3.7	4.4	4.5	5.4	3.7
			Maximum	8.3	8.3	8.4	8.9	8.2	8.5	8.6	8.9	9.0	8.3	8.3	9.1	8.9	8.3	8.5

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
pH

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	1	8.04	7.48	7.65	7.09	7.39	8.01	7.63	7.91	7.11	7.80	7.48	8.09	7.99	7.78	7.97
27-Jan-06	0	7:00	4	8.20	7.47	7.57	7.13	7.37	7.66	7.96	8.05	7.12	7.56	7.89	7.94	8.06	7.87	7.99
27-Jan-06	0	7:00	5	8.24	7.56	7.83	7.23	7.44	7.12	8.03	7.57	7.96	7.97	8.03	8.09	8.09	7.74	7.88
27-Jan-06	0	7:00	8	8.26	7.46	7.73	7.53	7.45	7.72	8.06	7.88	7.99	7.47	8.08	8.05	8.03	7.66	8.02
30-Jan-06	3	9:00	4	8.21	7.57	7.47	7.75	7.86	7.41	8.01	7.92	7.00	7.42	7.97	7.91	8.00	7.89	7.77
30-Jan-06	3	9:00	7	8.07	7.62	7.49	7.62	7.52	7.52	8.16	8.00	7.46	7.49	8.00	8.00	8.00	7.46	7.81
2-Feb-06	7	7:00	1	7.55	7.52	8.11	7.78	8.15	7.95	7.77	7.56	7.56	7.91	8.08	8.13	7.95	7.85	8.01
2-Feb-06	7	7:00	4	8.15	7.69	7.79	7.85	8.11	7.78	8.05	7.60	7.96	7.82	7.54	7.90	7.96	7.91	7.97
2-Feb-06	7	7:00	5	8.16	7.53	7.48	8.12	7.80	7.48	8.12	7.71	7.58	8.17	7.97	7.99	8.18	7.95	7.86
2-Feb-06	7	7:00	8	7.76	7.59	7.97	7.93	7.92	7.65	7.69	7.80	7.96	8.13	7.51	8.11	8.14	7.97	8.01
			Average	**8.06**	**7.55**	**7.71**	**7.60**	**7.70**	**7.63**	**7.95**	**7.80**	**7.57**	**7.77**	**7.86**	**8.02**	**8.04**	**7.81**	**7.93**
			Minimum	7.55	7.46	7.47	7.09	7.37	7.12	7.63	7.56	7.00	7.42	7.48	7.90	7.95	7.46	7.77
			Maximum	8.26	7.69	8.11	8.12	8.15	8.01	8.16	8.05	7.99	8.17	8.08	8.13	8.18	7.97	8.02

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	1	170	149	136	151	161	132	175	142	139	151	138	143	136	138	129
27-Jan-06	0	7:00	8	141	156	137	141	160	131	155	143	139	149	137	142	133	137	129
3-Feb-06	7	7:00	1	172	183	148	157	171	148	178	155	160	153	146	157	153	140	150
3-Feb-06	7	7:00	8	163	185	147	155	170	147	187	147	158	153	153	156	153	149	147
			Average	**161**	**168**	**142**	**151**	**166**	**139**	**173**	**147**	**149**	**151**	**143**	**150**	**144**	**141**	**139**
			Minimum	141	149	136	141	160	131	155	142	139	149	137	142	133	137	129
			Maximum	172	185	148	157	171	148	187	155	160	153	153	157	153	149	150

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
Ammonia (ppm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	1	<0.063	<0.063	0.165	1.185	3.534	<0.063	1.711	0.121	<0.063	0.113	<0.063	<0.063	<0.063	0.089	<0.063
27-Jan-06	0	7:00	8	<0.063	<0.063	0.188	0.37	3.102	<0.063	1.015	0.132	<0.063	0.156	<0.063	<0.063	<0.063	<0.063	<0.063
3-Feb-06	7	7:00	1	2.406	1.015	0.637	1.235	2.251	0.707	3.026	0.794	0.821	0.814	0.296	0.934	0.863	0.743	0.532
3-Feb-06	7	7:00	8	1.688	1.122	0.608	1.204	2.446	0.701	3.443	0.515	0.715	0.778	0.476	0.93	0.885	0.695	0.534
			Average	**1.040**	**0.549**	**0.400**	**0.999**	**2.833**	**0.368**	**2.299**	**0.391**	**0.400**	**0.465**	**0.208**	**0.482**	**0.453**	**0.390**	**0.283**
			Minimum	<0.063	<0.063	0.165	0.370	2.251	<0.063	1.015	0.121	<0.063	0.113	<0.063	<0.063	<0.063	<0.063	<0.063
			Maximum	2.406	1.122	0.637	1.235	3.534	0.707	3.443	0.794	0.821	0.814	0.476	0.934	0.885	0.743	0.534

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
DOC (ppm)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	1	2.9	5.0	3.4	4.0	8.3	4.4	4.7	2.6	10.0	3.6	3.4	3.9	4.3	4.4	5.1
27-Jan-06	0	7:00	8	3.1	4.2	3.8	4.2	6.1	5.0	2.8	2.6	5.8	3.6	3.3	3.8	7.6	4.1	6.8
3-Feb-06	7	7:00	1	4.5	2.8	2.3	2.9	2.7	4.0	4.2	2.5	5.4	2.8	2.1	2.8	2.6	2.7	3.0
3-Feb-06	7	7:00	8	3.7	2.9	3.0	4.0	2.8	3.7	4.2	2.2	4.1	2.4	3.3	2.8	2.7	2.6	2.6
			Average	**3.6**	**3.7**	**3.1**	**3.8**	**5.0**	**4.3**	**4.0**	**2.5**	**6.3**	**3.1**	**3.0**	**3.3**	**4.3**	**3.5**	**4.4**
			Minimum	2.9	2.8	2.3	2.9	2.7	3.7	2.8	2.2	4.1	2.4	2.1	2.8	2.6	2.6	2.6
			Maximum	4.5	5.0	3.8	4.2	8.3	5.0	4.7	2.6	10.0	3.6	3.4	3.9	7.6	4.4	6.8

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	3	46.0	51.6	50.0	63.6	63.6	88.8	62.0	51.6		54.4	56.8	60.8	74.0	54.8	67.2
27-Jan-06	0	7:00	7	58.4	51.6	56.4	70.8	60.4	72.8	56.4	55.6	53.6	54.0	54.8	60.4	58.4	49.6	64.0
3-Feb-06	7	7:00	3	46.4	62.8	54.8	49.6	53.2	52.0	57.6	52.4	50.0	51.6	50.8	60.4	48.8	48.4	49.6
3-Feb-06	7	7:00	7	51.2	60.8	47.2	50.0	56.8	52.0	58.8	57.2	54.4	50.8	48.8	52.0	56.0	50.0	48.4
			Average	**50.5**	**56.7**	**52.1**	**58.5**	**58.5**	**66.4**	**58.7**	**54.2**	**52.7**	**52.7**	**52.8**	**58.4**	**59.3**	**50.7**	**57.3**
			Minimum	46.0	51.6	47.2	49.6	53.2	52.0	56.4	51.6	50.0	50.8	48.8	52.0	48.8	48.4	48.4
			Maximum	58.4	62.8	56.4	70.8	63.6	88.8	62.0	57.2	54.4	54.4	56.8	60.8	74.0	54.8	67.2

Appendix Table 17. Water Chemistry Parameters fo *Pimephales promelas* Exposed to Ashland Harbor Sediments and UV Light, 27 January 2006 to 2 February 2006.
Alkalinity (mg/L as CaCO3)

Date	Day	Time	Rep	Silica Sand	Form. Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
27-Jan-06	0	7:00	2	59.2	52.4	56.8	62.0	79.6	53.6	66.4	57.6	71.6	55.2	58.8	60.4	55.2	48.0	52.8
27-Jan-06	0	7:00	6	54.4	54.8	55.6	69.6	70.0	52.4	64.8	56.4	61.2	46.4	53.6	67.2	53.2	51.6	55.2
3-Feb-06	7	7:00	2	63.2	68.0	54.8	60.8	67.2	57.6	73.2	60.4	62.0	58.4	60.0	61.2	58.0	56.4	57.2
3-Feb-06	7	7:00	6	63.6	65.2	47.2	59.6	67.2	58.4	71.6	72.0	64.4	60.0	60.4	59.6	58.8	58.4	59.2
			Average	**60.1**	**60.1**	**53.6**	**63.0**	**71.0**	**55.5**	**69.0**	**61.6**	**64.8**	**55.0**	**58.2**	**62.1**	**56.3**	**53.6**	**56.1**
			Minimum	54.4	52.4	47.2	59.6	67.2	52.4	64.8	56.4	61.2	46.4	53.6	59.6	53.2	48.0	52.8
			Maximum	63.6	68.0	56.8	69.6	79.6	58.4	73.2	72.0	71.6	60.0	60.4	67.2	58.8	58.4	59.2

APPENDIX 18

Survival and Growth of *C. dilutus* Exposed to Ashland Harbor Sediments,
10 February 2006 to 3 March 2006

Appendix Table 18. Survival and Growth of *C. dilutus* exposed to Ashland Harbor Sediment, 10 February 2006 to 3 March 2006.

Treatment	Test Sediment	Rep	Number of Survivors (12)	Average Survival (%)	Standard Deviation	Number Weighed	Total Dry (oven)Wt (mg)	Ash Wt (mg)	Ash-Free(AF) Dry Wt (mg)	Individual AF Dry Wt (mg)	Average AF Dry Wt (mg)	Standard Deviation
A	Silica Sand	1	14			14	12.8	1.5	11.3	0.81		
A	Silica Sand	2	10			9	9.6	1	8.6	0.96		
A	Silica Sand	3	12			12	9.4	0.9	8.5	0.71		
A	Silica Sand	4	12			12	11.4	1.1	10.3	0.86		
A	Silica Sand	5	13			13	13	1.8	11.2	0.86		
A	Silica Sand	6	9			9	11.4	1.3	10.1	1.12		
A	Silica Sand	7	12			12	11.5	1.1	10.4	0.87		
A	Silica Sand	8	14	100%	18	14	10.3	1	9.3	0.66	0.86	0.14
B	Form. Sediment	1	3			3	8.2	1.7	6.5	2.17		
B	Form. Sediment	2	0			0						
B	Form. Sediment	3	2			2	6	1.1	4.9	2.45		
B	Form. Sediment	4	5			5	3.5	0.5	3	0.60		
B	Form. Sediment	5	3			1	2	0.2	1.8	1.80		
B	Form. Sediment	6	6			6	1.7	0.3	1.4	0.23		
B	Form. Sediment	7	5			4	8.9	2.1	6.8	1.70		
B	Form. Sediment	8	5	30%	20	5	10.3	2.5	7.8	1.56	1.50	0.81
C	W. Bearskin	1	11			11	17.5	3	14.5	1.32		
C	W. Bearskin	2	10			10	16.9	4.1	12.8	1.28		
C	W. Bearskin	3	12			12	18.8	4.3	14.5	1.21		
C	W. Bearskin	4	12			12	19.8	4.7	15.1	1.26		
C	W. Bearskin	5	11			9	12.7	2.3	10.4	1.16		
C	W. Bearskin	6	12			12	18.9	3.6	15.3	1.28		
C	W. Bearskin	7	12			11	16.7	3.6	13.1	1.19		
C	W. Bearskin	8	13	97%	9	12	16.8	3.4	13.4	1.12	1.23	0.07
D	SQT9	1	4			1	1.6	0.1	1.5	1.50		
D	SQT9	2	1			1	4.4	0.1	4.3	4.30		
D	SQT9	3	0			0						
D	SQT9	4	8			4	7.8	1	6.8	1.70		
D	SQT9	5	0			0						
D	SQT9	6	1			0						
D	SQT9	7	0			0						
D	SQT9	8	2	17%	28	0					2.50	1.56
E	SQT13	1	7			7	18.3	3	15.3	2.19		
E	SQT13	2	5			1	2.8	0.3	2.5	2.50		
E	SQT13	3	0			0						
E	SQT13	4	5			3	10.4	0.9	9.5	3.17		
E	SQT13	5	4			0						
E	SQT13	6	0			0						
E	SQT13	7	0			0						
E	SQT13	8	1	23%	28	1	2.2	0.3	1.9	1.90	2.44	0.54
F	SQT11	1	2			1	1.6	0.1	1.5	1.50		
F	SQT11	2	0			0						
F	SQT11	3	1			0						
F	SQT11	4	0			0						
F	SQT11	5	0			0						
F	SQT11	6	0			0						
F	SQT11	7	0			0						
F	SQT11	8	0	3%	7	0					1.50	
G	SQT14	1	1			1	4.2	0.4	3.8	3.80		
G	SQT14	2	3			1	4.4	1.2	3.2	3.20		
G	SQT14	3	6			2	5.5	0.5	5	2.50		
G	SQT14	4	2			0						
G	SQT14	5	9			8	14.8	2.2	12.6	1.58		
G	SQT14	6	1			1	2.7	0.5	2.2	2.20		
G	SQT14	7	6			1	2.4	0.2	2.2	2.20		
G	SQT14	8	1	30%	30	0					2.58	0.80
H	SQT6	1	12			12	24.2	8.9	15.3	1.28		
H	SQT6	2	11			9	15.3	3.9	11.4	1.27		
H	SQT6	3	14			12	17.4	5.2	12.2	1.02		
H	SQT6	4	11			8	14.4	3	11.4	1.43		
H	SQT6	5	12			10	16.8	4.6	12.2	1.22		
H	SQT6	6	13			13	18.9	4.1	14.8	1.14		
H	SQT6	7	9			9	16.2	4.3	11.9	1.32		
H	SQT6	8	10	96%	16	10	16.3	4.7	11.6	1.16	1.23	0.12

Treatment	Test Sediment	Rep	Number of Survivors (12)	Average Survival (%)	Standard Deviation	Number Weighed	Total Dry (oven)Wt (mg)	Ash Wt (mg)	Ash-Free(AF) Dry Wt (mg)	Individual AF Dry Wt (mg)	Average AF Dry Wt (mg)	Standard Deviation
I	SQT2	1	0			0						
I	SQT2	2	0			0						
I	SQT2	3	0			0						
I	SQT2	4	0			0						
I	SQT2	5	0			0						
I	SQT2	6	0			0						
I	SQT2	7	0			0						
I	SQT2	8	0	0%	0	0						
J	SQT7	1	0			0						
J	SQT7	2	0			0						
J	SQT7	3	1			0						
J	SQT7	4	0			0						
J	SQT7	5	3			1	3.2	0.3	2.9	2.90		
J	SQT7	6	0			0						
J	SQT7	7	0			0						
J	SQT7	8	0	4%	11	0					2.90	
K	SQT4	1	2			2	5.9	0.5	5.4	2.70		
K	SQT4	2	0			0						
K	SQT4	3	2			2	5.8	0.6	5.2	2.60		
K	SQT4	4	2			1	2.3	0.1	2.2	2.20		
K	SQT4	5	0			0						
K	SQT4	6	1			0						
K	SQT4	7	0			0						
K	SQT4	8	0	7%	10	0					2.50	0.26
L	SQT3	1	2			1	4.1	0.1	4	4.00		
L	SQT3	2	3			3	8.9	0.9	8			
L	SQT3	3	2			1	4.7	0.4	4.3	4.30		
L	SQT3	4	1			1	3.1	0.3	2.8	2.80		
L	SQT3	5	3			1	3.3	0.2	3.1			
L	SQT3	6	1			0						
L	SQT3	7	0			0						
L	SQT3	8	0	13%	12	0					3.70	0.79
M	SQT5	1	2			0						
M	SQT5	2	0			0						
M	SQT5	3	0			0						
M	SQT5	4	0			0						
M	SQT5	5	1			0						
M	SQT5	6	3			0						
M	SQT5	7	0			0						
M	SQT5	8	0	6%	12	0						
N	SQT 1	1	0			0						
N	SQT 1	2	1			0						
N	SQT 1	3	0			0						
N	SQT 1	4	0			0						
N	SQT 1	5	0			0						
N	SQT 1	6	0			0						
N	SQT 1	7	0			0						
N	SQT 1	8	0	1%	4	0						
O	SQT8	1	0			0						
O	SQT8	2	0			0						
O	SQT8	3	0			0						
O	SQT8	4	1			0						
O	SQT8	5	0			0						
O	SQT8	6	0			0						
O	SQT8	7	0			0						
O	SQT8	8	0	1%	4	0						

APPENDIX 19

Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006

Appendix Table 19. Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006.
Temperature (° C)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
10-Feb-06	0	7:00	1	22.9	23.7	23.3	22.8	23.0	23.2	22.9	23.0	23.1	23.2	23.4	22.8	22.8	23.1	22.9
10-Feb-06	0	7:00	2	23.0	23.5	23.4	23.3	23.1	23.4	22.9	23.0	23.4	23.2	23.3	23.0	22.8	23.2	22.9
10-Feb-06	0	7:00	3	23.1	23.6	23.4	23.0	23.1	23.1	23.1	23.0	23.4	23.1	23.3	22.9	22.9	23.2	22.9
10-Feb-06	0	7:00	4	23.0	23.6	23.4	23.1	23.2	23.1	22.9	22.9	23.4	23.2	23.2	22.9	22.8	23.2	22.9
10-Feb-06	0	7:00	5	23.0	23.6	23.4	22.9	22.9	23.2	22.9	22.9	23.5	23.3	23.2	22.9	22.8	23.1	23.0
10-Feb-06	0	7:00	6	23.0	23.7	23.4	23.0	23.0	23.6	22.9	22.9	23.3	23.4	23.2	22.9	22.9	23.3	22.9
10-Feb-06	0	7:00	7	23.0	23.6	23.4	23.0	23.0	23.0	22.9	22.9	23.4	23.2	23.2	22.8	22.9	23.2	22.8
10-Feb-06	0	7:00	8	23.0	23.6	23.3	23.0	23.0	23.2	23.0	22.9	23.3	23.4	23.2	22.8	23.0	23.2	22.9
11-Feb-06	1	9:15	4	23.1	23.7	23.5	22.9	23.2	23.5	23.0	23.0	23.6	23.4	23.4	23.1	23.0	23.7	23.0
11-Feb-06	1	9:15	6	23.0	23.8	23.6	23.1	23.2	23.6	23.0	23.1	23.5	23.5	23.6	23.1	23.0	23.4	23.2
11-Feb-06	1	18:00	4	23.1	23.7	23.6	23.4	23.4	23.3	23.3	23.0	23.6	23.5	23.4	23.1	23.1	23.8	23.4
11-Feb-06	1	18:00	8	23.1	23.7	23.6	23.3	23.3	23.6	23.3	23.1	23.7	23.6	23.4	23.3	23.3	23.7	23.3
12-Feb-06	2	9:15	4	23.1	23.5	23.6	23.0	23.0	23.7	23.3	23.2	23.6	23.5	23.4	23.1	23.0	23.9	23.0
12-Feb-06	2	9:15	5	23.1	23.7	23.6	23.6	23.1	23.8	23.1	23.1	23.7	23.5	23.6	23.1	23.0	23.7	23.0
12-Feb-06	2	18:10	2	23.1	23.7	23.7	23.2	23.2	23.4	23.0	23.2	24.0	23.8	23.6	23.1	23.1	23.9	23.3
12-Feb-06	2	18:10	4	23.2	23.8	23.7	23.3	23.3	23.6	23.3	23.2	23.8	23.6	23.5	23.2	23.2	24.0	23.2
13-Feb-06	3	9:00	4	23.1	23.7	23.5	22.9	23.0	23.2	23.2	22.8	23.5	23.4	23.2	22.9	22.9	23.6	23.0
13-Feb-06	3	9:00	7	23.0	23.7	23.4	23.0	23.0	23.5	23.1	22.9	23.6	23.3	23.4	23.0	23.0	23.5	23.0
13-Feb-06	3	15:45	3	23.2	23.8	23.4	23.3	23.2	23.6	23.1	23.0	23.5	23.5	23.3	23.1	23.1	23.4	23.1
13-Feb-06	3	15:45	4	23.3	23.9	23.4	23.3	23.3	23.6	23.2	23.0	23.6	23.5	23.3	23.1	23.1	23.6	23.1
14-Feb-06	4	9:30	1	23.0	23.7	23.5	23.1	23.0	23.5	23.0	22.9	23.3	23.4	23.4	22.8	22.9	23.3	23.1
14-Feb-06	4	9:30	4	23.0	23.8	23.3	23.0	23.0	23.3	23.0	22.9	23.5	23.3	23.4	22.9	22.9	23.5	23.2
14-Feb-06	4	16:00	3	22.4	23.2	22.9	22.6	22.4	23.0	22.4	22.4	23.0	22.9	22.7	22.7	22.6	23.0	22.8
14-Feb-06	4	16:00	4	22.5	23.1	22.8	22.6	22.4	23.1	22.5	22.4	23.0	22.9	22.9	22.5	22.6	23.2	22.8
15-Feb-06	5	9:20	4	23.2	23.6	23.4	23.4	23.3	23.5	23.5	23.2	23.0	23.2	23.3	23.4	23.0	23.5	23.0
15-Feb-06	5	9:20	6	23.2	23.6	23.5	23.4	23.3	23.3	23.4	23.3	23.3	23.3	23.3	23.4	23.1	23.3	23.1
15-Feb-06	5	15:30	4	22.5	22.9	22.7	22.7	22.5	22.2	22.7	22.5	22.8	22.8	22.9	22.5	22.9	23.0	23.4
15-Feb-06	5	15:30	8	22.5	22.9	23.8	22.9	22.7	22.4	22.7	22.7	23.0	23.0	23.0	22.8	22.9	23.0	23.4
16-Feb-06	6	8:00	4	23.6	23.4	23.3	23.5	23.3	23.5	23.5	23.0	23.3	23.3	23.3	23.0	23.1	23.6	23.1
16-Feb-06	6	8:00	5	23.3	23.4	23.2	23.4	23.3	23.4	23.3	23.2	23.2	23.4	23.3	23.1	23.2	23.6	23.2
16-Feb-06	6	15:40	2	23.0	23.0	22.7	23.1	22.9	22.9	23.0	22.8	22.8	23.0	23.2	22.8	23.0	23.1	22.5
16-Feb-06	6	15:40	4	23.0	23.1	22.8	23.1	22.9	22.9	23.0	22.8	22.9	23.0	23.1	22.8	23.0	23.2	22.5
17-Feb-06	7	6:30	4	23.2	23.4	22.8	23.2	23.2	23.0	23.2	22.8	23.0	22.8	22.8	22.8	23.0	23.2	22.8
17-Feb-06	7	6:30	7	23.2	23.4	23.0	23.3	23.2	23.0	23.2	23.0	23.1	22.9	23.0	23.0	23.0	23.3	22.8
17-Feb-06	7	15:20	3	22.6	23.0	22.4	22.7	22.6	22.9	22.7	22.5	22.9	22.4	22.7	22.7	22.6	22.9	22.1
17-Feb-06	7	15:20	4	22.7	23.1	22.5	22.7	22.7	22.8	22.7	22.3	23.1	22.8	22.8	22.6	22.7	23.1	22.2
18-Feb-06	8	7:00	4	22.6	23.1	22.6	22.8	22.6	22.6	22.8	22.2	22.5	22.5	22.6	22.4	22.5	22.5	22.2
18-Feb-06	8	7:00	6	22.6	23.0	22.6	22.9	22.5	22.8	22.5	22.2	22.5	22.5	22.6	22.3	22.5	22.6	22.2
18-Feb-06	8	18:00	4	23.1	23.3	23.0	23.0	22.9	22.6	23.0	22.8	22.9	23.0	23.0	22.9	23.0	23.1	22.7
18-Feb-06	8	18:00	8	23.1	23.3	22.9	23.2	22.9	22.9	23.2	22.9	22.9	23.0	23.0	23.0	23.0	23.1	22.6
19-Feb-06	9	8:30	4	23.2	23.2	22.8	23.2	23.2	22.6	23.1	22.9	23.1	23.0	22.9	22.7	23.1	23.1	22.7
19-Feb-06	9	8:30	7	23.1	23.3	23.0	23.3	23.1	22.8	23.3	23.0	23.1	23.1	23.0	22.9	23.3	22.8	22.9
19-Feb-06	9	16:40	1	23.3	23.6	23.3	23.5	23.5	23.2	23.4	23.4	23.4	23.5	23.3	23.3	23.5	23.5	23.0
19-Feb-06	9	16:40	4	23.4	23.7	23.4	23.6	23.5	23.3	23.5	23.4	23.5	23.5	23.4	23.2	23.4	23.6	23.1
20-Feb-06	10	8:40	4	23.3	23.7	23.4	23.6	23.5	23.5	23.4	23.3	23.3	23.5	23.4	23.3	23.3	23.5	23.1
20-Feb-06	10	8:40	5	23.4	23.6	23.3	23.6	23.5	23.4	23.5	23.5	23.4	23.5	23.4	23.3	23.4	23.3	23.1
20-Feb-06	10	15:30	2	23.5	23.5	23.4	23.5	23.4	23.5	23.5	23.5	23.5	23.5	23.5	23.2	23.4	23.5	23.5
20-Feb-06	10	15:30	4	23.5	23.6	23.4	23.6	23.4	23.3	23.4	23.3	23.6	23.4	23.5	23.2	23.4	23.7	23.5
21-Feb-06	11	8:30	4	23.5	23.6	23.4	23.4	23.3	23.4	23.2	23.3	23.3	23.3	23.4	23.2	23.2	23.4	23.3
21-Feb-06	11	8:30	7	23.5	23.6	23.3	23.5	23.2	23.3	23.3	23.1	23.4	23.2	23.3	23.2	23.0	23.4	23.3
21-Feb-06	11	15:00	3	22.8	22.9	22.9	23.0	22.9	22.8	22.8	22.7	23.0	22.7	22.7	22.7	22.8	22.7	22.7
21-Feb-06	11	15:00	4	22.8	22.9	22.9	22.9	22.8	22.8	22.9	22.8	23.1	22.8	22.8	22.7	22.8	22.9	22.7

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
22-Feb-06	12	9:10	1	23.5	23.8	23.6	23.4	23.3	23.5	23.3	23.2	23.5	23.5	23.5	23.3	23.1	23.6	23.2
22-Feb-06	12	9:10	4	23.5	23.8	23.6	23.3	23.2	23.4	23.3	23.3	23.6	23.4	23.4	23.3	23.0	23.6	23.2
22-Feb-06	12	15:30	4	23.4	23.8	23.6	23.5	23.4	23.6	23.4	23.2	23.6	23.6	23.5	23.3	23.3	23.6	23.4
22-Feb-06	12	15:30	5	23.5	23.9	23.6	23.6	23.5	23.7	23.4	23.3	23.7	23.6	23.5	23.3	23.5	23.5	23.6
23-Feb-06	13	9:00	4	23.0	23.3	23.2	23.1	23.2	23.0	23.2	23.0	23.2	23.6	23.1	23.1	23.0	23.3	23.1
23-Feb-06	13	9:00	6	23.1	23.6	23.2	23.3	23.2	23.4	23.1	23.0	23.4	23.1	23.0	23.0	23.2	23.3	23.1
23-Feb-06	13	14:30	4	22.9	23.1	22.9	23.0	23.0	22.9	23.0	22.9	23.0	22.8	23.1	22.9	22.9	23.3	22.8
23-Feb-06	13	14:30	8	23.1	23.1	23.0	23.2	23.0	22.9	23.0	22.9	23.0	23.0	23.1	23.1	23.1	23.3	23.0
24-Feb-06	14	8:00	4	23.0	23.3	23.3	23.3	23.0	23.0	23.3	23.3	23.0	23.0	23.3	23.3	23.0	23.3	23.1
24-Feb-06	14	8:00	5	23.1	23.2	23.3	23.2	23.0	23.0	23.2	23.2	23.0	23.2	23.3	23.2	23.0	23.3	23.2
24-Feb-06	14	15:30	2	23.0	23.3	22.8	23.1	22.8	23.0	23.2	23.2	23.1	23.2	23.0	22.9	23.0	23.2	22.7
24-Feb-06	14	15:30	4	23.0	23.1	22.8	23.0	23.1	23.0	23.3	23.2	23.1	23.0	23.1	23.0	22.9	23.3	22.7
25-Feb-06	15	8:50	4	23.5	23.7	23.4	23.7	23.6	23.5	23.8	23.5	23.4	23.2	23.2	23.3	23.3	23.4	23.3
25-Feb-06	15	8:50	7	23.7	23.7	23.4	23.8	23.6	23.4	23.7	23.5	23.2	23.2	23.4	23.4	23.5	23.3	23.3
25-Feb-06	15	15:15	3	23.9	23.5	23.3	23.8	23.7	23.3	23.7	23.6	23.3	23.2	23.2	23.5	23.7	23.4	23.1
25-Feb-06	15	15:15	4	23.9	23.6	23.4	23.9	23.8	23.4	23.8	23.6	23.5	23.4	23.2	23.5	23.8	23.6	23.2
26-Feb-06	16	9:00	1	23.5	23.4	23.2	23.6	23.4	23.0	23.5	23.2	23.1	22.9	23.2	23.2	23.1	23.2	22.9
26-Feb-06	16	9:00	4	23.4	23.4	23.1	23.6	23.4	23.0	23.5	23.2	23.2	23.0	23.0	23.1	23.2	23.3	22.9
26-Feb-06	16	16:00	4	23.6	23.5	23.0	23.4	23.4	23.4	23.4	23.2	23.3	22.8	22.7	23.0	23.1	23.3	23.0
26-Feb-06	16	16:00	8	23.5	23.5	23.0	23.5	23.2	22.9	23.5	23.2	23.3	23.0	22.8	23.2	23.3	23.2	23.1
27-Feb-06	17	10:00	4	23.7	23.6	23.4	23.6	23.6	23.1	23.5	23.3	23.3	23.0	23.2	23.4	23.5	23.4	23.2
27-Feb-06	17	10:00	6	23.7	23.6	23.4	23.6	23.6	23.5	23.5	23.4	23.3	23.3	23.3	23.5	23.6	23.4	23.1
27-Feb-06	17	15:30	4	23.2	23.1	23.0	23.2	23.1	22.7	23.0	22.9	23.1	23.0	22.8	22.8	23.0	23.2	22.9
27-Feb-06	17	15:30	8	23.2	23.1	22.9	23.3	23.1	23.0	23.0	22.9	22.9	23.1	22.7	23.0	23.1	23.1	23.0
28-Feb-06	18	9:00	4	23.6	23.5	23.2	23.6	23.6	23.3	24.6	23.6	23.3	23.3	23.3	23.2	23.4	23.3	23.1
28-Feb-06	18	9:00	5	24.6	23.6	23.4	23.6	23.6	23.4	23.5	24.4	23.6	23.5	23.2	23.2	23.4	23.2	23.2
28-Feb-06	18	15:00	2	23.2	22.9	22.7	23.3	23.1	22.7	23.4	22.8	23.0	22.8	22.9	23.2	22.9	23.0	22.9
28-Feb-06	18	15:00	4	23.2	22.9	22.7	23.3	23.2	22.8	23.4	22.9	23.0	22.7	22.8	23.2	22.9	23.0	22.9
1-Mar-06	19	9:10	4	23.7	23.5	23.3	23.7	23.4	23.0	23.6	23.4	23.4	23.2	23.1	23.2	23.4	23.3	23.4
1-Mar-06	19	9:10	7	23.7	23.4	23.3	23.7	23.7	23.3	23.6	23.4	23.3	23.1	23.1	23.3	23.5	23.1	23.3
1-Mar-06	19	18:00	3	23.0	22.9	22.7	23.1	23.1	22.6	23.0	23.0	22.8	22.5	22.8	23.0	22.8	22.7	22.7
1-Mar-06	19	18:00	4	23.0	23.0	22.6	23.1	23.1	22.7	23.1	23.0	23.0	22.6	22.7	22.8	22.8	22.8	22.8
2-Mar-06	20	5:45	1	23.5	23.2	23.0	23.1	23.2	23.0	23.3	23.1	23.0	22.6	22.8	22.7	23.0	22.7	23.0
2-Mar-06	20	5:45	2	23.2	23.2	23.0	23.4	23.5	23.0	23.6	23.1	23.1	22.7	22.7	22.9	23.0	22.8	23.0
2-Mar-06	20	5:45	3	23.3	23.1	23.1	23.3	23.0	23.0	23.4	23.2	22.9	22.7	22.9	22.9	22.8	22.8	23.0
2-Mar-06	20	5:45	4	23.3	23.2	23.0	23.3	23.2	23.0	23.4	23.0	23.0	22.8	23.0	23.1	22.9	23.1	23.1
2-Mar-06	20	5:45	5	23.2	23.2	23.0	23.5	23.1	23.3	23.3	23.2	23.0	22.5	22.8	23.0	23.0	22.8	23.0
2-Mar-06	20	5:45	6	23.3	23.2	22.8	23.6	23.2	22.9	23.2	23.1	23.1	22.9	22.8	23.0	23.0	22.9	23.0
2-Mar-06	20	5:45	7	23.2	23.2	22.8	23.2	23.0	22.8	23.2	23.1	23.1	22.8	22.8	23.1	23.0	22.9	23.0
2-Mar-06	20	5:45	8	23.3	23.1	23.0	23.1	23.1	22.9	23.2	23.0	22.9	22.9	23.8	23.1	23.1	23.0	23.1
			Average	**23.2**	**23.4**	**23.2**	**23.3**	**23.2**	**23.2**	**23.2**	**23.1**	**23.2**	**23.1**	**23.1**	**23.0**	**23.1**	**23.3**	**23.0**
			Minimum	22.4	22.9	22.4	22.6	22.4	22.2	22.4	22.2	22.5	22.4	22.6	22.3	22.5	22.5	22.1
			Maximum	24.6	23.9	23.8	23.9	23.8	23.8	24.6	24.4	24.0	23.8	23.8	23.5	23.8	24.0	23.6

Appendix Table 19. Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
10-Feb-06	0	7:00	1	5.9	6.5	6.4	4.8	7.3	4.8	6.1	7.6	6.2	7.9	6.2	6.4	6.1	7.6	7.8
10-Feb-06	0	7:00	2	6.1	6.6	7.0	3.6	5.9	4.2	6.3	7.7	7.0	7.9	5.1	7.0	6.1	7.5	5.4
10-Feb-06	0	7:00	3	6.3	6.8	6.6	3.6	4.8	4.8	7.0	7.6	6.8	7.4	7.1	6.0	7.9	7.6	6.0
10-Feb-06	0	7:00	4	6.5	7.0	6.9	4.3	8.0	4.8	5.9	7.7	7.0	6.2	6.2	6.1	6.4	7.3	5.5
10-Feb-06	0	7:00	5	6.6	7.1	7.2	4.2	3.9	3.1	6.2	7.5	5.5	7.1	6.1	6.2	7.0	7.2	7.2
10-Feb-06	0	7:00	6	6.7	7.1	7.4	3.9	6.5	4.2	5.6	7.7	5.0	8.3	6.0	5.1	5.7	7.1	5.8
10-Feb-06	0	7:00	7	6.9	7.2	7.5	5.2	5.6	4.7	5.6	7.8	5.1	8.5	5.1	6.5	6.8	7.1	6.3
10-Feb-06	0	7:00	8	7.1	7.8	6.8	4.5	5.5	3.4	7.1	7.9	4.4	8.4	6.2	5.4	7.4	8.3	6.4
11-Feb-06	1	9:15	4	4.0	4.6	4.8	5.0	5.1	5.2	5.7	5.5	6.4	6.2	6.5	6.0	5.7	6.2	7.4
11-Feb-06	1	9:15	6	4.6	4.3	4.8	4.7	5.0	3.7	5.4	5.8	6.1	6.0	5.7	6.2	5.5	6.2	6.8
11-Feb-06	1	18:00	4	5.0	5.4	5.8	6.5	6.0	5.1	6.2	6.2	7.0	7.2	5.3	7.2	5.7	7.2	6.9
11-Feb-06	1	18:00	8	5.0	5.4	4.6	4.9	5.6	3.7	6.1	6.3	6.6	6.0	6.2	6.3	6.9	7.3	6.4
12-Feb-06	2	9:15	4	3.0	3.8	3.5	4.5	4.7	4.4	4.6	4.4	5.1	5.3	5.3	5.0	5.2	5.2	5.4
12-Feb-06	2	9:15	5	3.1	3.6	3.7	4.3	4.5	4.9	4.7	4.4	5.0	5.0	5.3	4.7	5.2	5.2	5.7
12-Feb-06	2	18:10	2	2.5	3.0	3.5	3.9	2.5	4.3	4.6	4.1	4.5	4.5	4.0	4.5	4.8	4.9	4.0
12-Feb-06	2	18:10	4	2.6	2.8	2.9	3.9	3.5	3.3	4.0	4.1	4.5	4.6	3.9	4.4	4.5	5.3	3.9
13-Feb-06	3	9:00	4	4.5	4.3	5.0	5.0	3.8	4.2	5.1	5.1	5.2	5.0	5.0	5.1	5.1	5.2	4.7
13-Feb-06	3	9:00	7	4.3	4.4	4.5	4.6	2.4	5.0	5.2	4.6	4.7	4.6	4.3	5.0	4.9	5.4	4.4
13-Feb-06	3	15:45	3	7.0	6.9	6.1	6.8	5.0	6.9	6.7	7.0	6.9	7.2	5.5	7.3	6.8	8.2	6.4
13-Feb-06	3	15:45	4	7.0	6.1	5.6	6.9	5.9	4.4	6.7	7.0	7.3	7.3	7.3	7.2	6.9	8.5	6.5
14-Feb-06	4	9:30	1	7.8	6.0	6.4	6.3	2.3	4.2	5.0	5.6	6.5	6.4	6.1	6.2	6.1	7.8	5.1
14-Feb-06	4	9:30	4	6.0	6.1	6.2	6.6	3.5	6.0	5.2	5.6	6.2	5.8	5.7	6.5	5.6	7.9	5.7
14-Feb-06	4	16:00	3	6.4	4.6	4.4	6.6	2.9	6.0	5.5	6.1	6.3	4.0	3.6	7.2	3.8	6.6	5.8
14-Feb-06	4	16:00	4	6.3	3.7	4.4	6.4	2.8	5.8	6.5	5.1	6.9	4.8	3.4	6.6	3.8	7.3	6.9
15-Feb-06	5	9:20	4	7.8	6.6	7.3	6.6	6.7	5.6	7.6	6.2	7.6	7.6	7.9	8.1	5.2	8.0	6.9
15-Feb-06	5	9:20	6	6.4	5.9	7.4	6.6	5.9	7.3	4.9	4.8	8.1	7.8	7.8	7.9	7.4	7.7	7.1
15-Feb-06	5	15:30	4	5.8	6.4	6.4	6.9	4.0	4.8	7.1	6.1	7.9	7.0	6.8	8.8	4.9	7.8	7.1
15-Feb-06	5	15:30	8	6.6	6.3	6.6	6.9	6.3	3.8	6.2	5.1	7.1	7.4	6.3	7.6	6.0	7.3	6.5
16-Feb-06	6	8:00	4	6.6	6.7	6.6	6.6	4.9	6.5	6.5	6.1	6.8	6.6	6.7	7.3	3.6	7.3	6.4
16-Feb-06	6	8:00	5	5.9	6.3	6.8	6.9	4.4	6.2	5.4	7.0	6.4	5.7	6.9	7.9	4.0	7.6	7.0
16-Feb-06	6	15:40	2	6.9	6.6	6.1	8.1	6.3	7.2	6.3	5.5	4.4	8.0	8.5	6.6	3.1	7.2	6.0
16-Feb-06	6	15:40	4	6.4	6.7	6.9	7.9	6.9	7.3	6.8	5.4	4.7	8.0	8.1	7.3	4.6	7.5	6.3
17-Feb-06	7	6:30	4	7.6	6.1	7.5	7.3	5.0	5.0	8.3	7.2	7.7	8.0	8.2	8.4	7.8	8.5	6.6
17-Feb-06	7	6:30	7	6.0	6.7	7.7	7.8	2.9	6.6	7.0	7.1	8.5	6.4	5.7	8.1	7.3	6.7	6.9
17-Feb-06	7	15:20	3	6.5	5.0	6.8	7.6	5.9	5.6	4.7	6.4	6.2	8.1	6.4	7.1	6.3	7.5	6.5
17-Feb-06	7	15:20	4	6.0	3.8	6.3	4.7	4.9	5.0	5.3	4.4	7.1	8.1	6.7	6.9	3.5	6.8	6.0
18-Feb-06	8	7:00	4	6.8	6.9	6.2	6.8	6.0	6.1	7.4	5.8	7.5	5.9	7.1	7.0	4.2	7.6	6.8
18-Feb-06	8	7:00	6	5.3	6.4	6.1	7.1	5.4	7.4	5.4	5.2	6.6	5.3	7.3	6.9	6.9	7.6	6.3
18-Feb-06	8	18:00	4	5.9	5.6	6.6	7.4	6.7	4.0	6.4	6.5	8.4	6.3	6.3	6.4	5.8	6.4	6.5
18-Feb-06	8	18:00	8	6.5	5.6	4.3	7.3	5.4	7.2	6.3	6.9	6.3	5.1	6.2	6.5	6.5	6.6	6.1
19-Feb-06	9	8:30	4	6.6	5.6	6.7	6.2	5.0	4.2	6.6	5.7	6.8	6.5	6.4	6.3	6.1	6.7	6.5
19-Feb-06	9	8:30	7	6.6	5.9	6.4	6.5	5.4	4.0	6.9	6.0	5.9	6.9	5.6	6.6	6.7	5.9	6.6
19-Feb-06	9	16:40	1	6.1	5.7	5.4	6.1	5.6	6.8	6.9	6.5	5.6	6.0	6.8	7.0	6.6	7.0	5.6
19-Feb-06	9	16:40	4	6.7	6.7	5.9	6.4	4.9	6.4	7.2	5.7	6.2	5.9	7.0	7.2	6.8	7.4	5.9
20-Feb-06	10	8:40	4	6.4	5.7	6.2	6.0	5.2	7.0	6.3	5.5	6.7	6.1	6.8	6.9	5.8	7.1	5.9
20-Feb-06	10	8:40	5	6.2	5.1	5.4	6.2	3.0	6.4	5.2	6.4	6.1	5.3	6.0	6.2	6.4	6.0	6.3
20-Feb-06	10	15:30	2	6.7	5.2	6.5	6.4	5.6	6.3	7.2	5.2	7.1	7.2	8.0	8.0	6.6	7.0	5.3
20-Feb-06	10	15:30	4	6.3	5.4	6.6	6.2	7.1	6.5	7.2	4.9	7.6	7.2	7.9	7.3	5.9	6.8	5.6
21-Feb-06	11	8:30	4	5.4	4.8	6.5	6.7	6.9	4.4	6.7	5.4	7.1	6.6	6.7	6.9	5.3	7.4	6.2
21-Feb-06	11	8:30	7	5.2	5.8	6.9	7.1	5.7	6.7	7.1	5.5	7.0	4.8	6.6	6.8	6.0	7.0	6.5
21-Feb-06	11	15:00	3	7.4	2.6	7.0	7.1	6.4	6.7	6.7	4.9	6.6	4.2	7.4	6.8	6.9	7.7	4.8
21-Feb-06	11	15:00	4	6.9	2.4	6.7	7.0	6.5	7.0	7.2	4.4	6.8	4.6	4.4	4.4	3.9	7.4	4.5

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
22-Feb-06	12	9:10	1	7.3	3.5	6.8	6.9	6.4	6.8	6.4	6.6	6.4	6.8	6.9	7.0	6.7	7.5	5.8
22-Feb-06	12	9:10	4	7.2	1.2	7.2	6.9	2.8	4.4	4.2	6.5	6.7	6.4	6.4	7.4	5.7	7.5	5.8
22-Feb-06	12	15:30	4	6.9	6.4	6.2	7.7	2.3	3.7	4.8	7.1	6.4	6.7	5.9	7.4	4.7	8.2	6.3
22-Feb-06	12	15:30	5	7.1	5.4	6.3	7.3	3.2	3.9	4.3	7.0	6.8	6.6	5.8	5.8	5.3	7.0	6.6
23-Feb-06	13	9:00	4	9.0	7.3	6.6	6.4	1.9	2.6	3.0	5.5	7.9	7.4	8.1	7.7	7.6	7.7	6.4
23-Feb-06	13	9:00	6	6.7	5.7	7.0	7.2	2.1	7.9	2.0	5.3	7.3	7.6	7.0	5.4	7.9	7.8	7.5
23-Feb-06	13	14:30	4	7.4	6.5	6.5	6.4	4.3	5.1	5.9	6.6	6.5	7.5	6.3	6.7	4.9	7.2	6.2
23-Feb-06	13	14:30	8	7.5	6.4	6.7	6.7	3.4	6.0	6.7	5.2	5.6	7.1	5.6	7.2	7.2	7.1	7.0
24-Feb-06	14	8:00	4	7.0	6.9	7.2	6.6	4.1	5.0	6.2	6.6	6.9	7.7	6.6	6.9	4.6	7.6	6.9
24-Feb-06	14	8:00	5	7.4	7.2	7.2	6.9	3.7	4.6	6.9	5.9	6.0	7.9	6.6	6.4	7.0	7.4	7.4
24-Feb-06	14	15:30	2	7.9	7.3	6.4	7.6	5.6	4.9	6.3	6.8	6.6	7.0	4.6	4.6	3.6	7.4	3.6
24-Feb-06	14	15:30	4	7.4	2.6	6.3	8.0	7.2	5.4	5.9	7.1	6.4	7.1	6.1	4.6	4.1	7.4	3.7
25-Feb-06	15	8:50	4	7.9	5.0	7.1	7.1	6.0	3.4	3.0	6.1	7.5	7.8	4.0	8.1	6.0	7.8	5.2
25-Feb-06	15	8:50	7	7.6	5.3	7.8	8.3	4.2	7.7	5.0	5.6	4.2	8.1	4.6	7.5	7.7	7.8	7.2
25-Feb-06	15	15:15	3	8.0	6.9	7.5	7.5	7.6	7.0	6.8	6.5	7.6	8.3	7.5	7.7	6.5	7.3	7.4
25-Feb-06	15	15:15	4	7.9	6.2	7.0	7.2	7.0	5.5	5.4	6.4	7.3	7.7	6.9	7.6	6.0	7.3	7.3
26-Feb-06	16	9:00	1	7.9	4.7	6.4	6.8	7.7	7.1	6.5	5.8	7.1	7.4	7.3	8.8	8.5	7.4	7.3
26-Feb-06	16	9:00	4	8.5	5.8	6.2	7.5	8.3	6.9	3.7	2.8	8.1	8.1	6.9	8.7	8.6	8.1	7.7
26-Feb-06	16	16:00	4	7.5	4.1	6.8	7.3	7.1	6.3	3.3	5.0	6.6	7.4	6.0	7.7	5.3	7.1	6.3
26-Feb-06	16	16:00	8	7.6	1.4	6.7	7.1	6.8	6.5	1.7	4.4	2.7	7.3	3.2	7.4	6.1	7.4	7.2
27-Feb-06	17	10:00	4	7.7	4.6	7.1	7.5	7.3	6.4	5.5	5.0	7.5	8.4	7.1	7.6	5.1	7.8	7.3
27-Feb-06	17	10:00	6	7.8	4.1	6.8	7.2	6.3	7.9	5.6	4.1	6.3	8.4	5.8	7.4	4.0	7.6	7.5
27-Feb-06	17	15:30	4	7.7	3.5	6.7	4.7	7.3	6.0	6.5	3.3	8.0	6.3	4.0	6.6	4.2	7.5	5.6
27-Feb-06	17	15:30	8	7.5	2.6	6.8	5.5	7.3	7.0	3.0	3.2	4.7	6.7	3.0	7.1	6.1	6.5	6.4
28-Feb-06	18	9:00	4	7.2	7.1	6.9	7.5	7.2	6.0	6.6	4.6	6.4	7.1	7.3	7.0	3.2	8.6	8.2
28-Feb-06	18	9:00	5	6.8	5.2	6.9	6.7	6.7	6.8	4.4	4.3	7.0	6.4	6.1	7.8	4.3	6.5	8.4
28-Feb-06	18	15:00	2	8.1	3.4	7.0	7.9	7.6	2.8	7.3	4.2	3.4	7.1	7.0	7.3	2.6	7.5	5.3
28-Feb-06	18	15:00	4	8.0	2.2	6.8	7.4	7.2	4.2	6.9	6.7	6.8	4.3	5.5	6.7	2.8	7.1	6.6
1-Mar-06	19	9:10	4	8.1	5.8	6.3	7.6	7.0	5.7	7.2	5.7	7.2	7.9	8.2	8.2	3.0	8.2	7.6
1-Mar-06	19	9:10	7	7.8	3.6	6.6	7.2	6.6	7.8	7.4	5.1	6.6	7.3	5.9	6.4	5.6	7.5	8.5
1-Mar-06	19	18:00	3	7.6	4.7	6.8	6.6	7.5	6.0	7.2	7.4	8.3	6.0	5.0	8.5	7.6	6.9	6.5
1-Mar-06	19	18:00	4	7.3	2.8	6.5	5.9	7.0	4.6	7.1	6.1	7.1	5.5	5.0	7.8	4.8	7.0	5.5
2-Mar-06	20	5:45	1	7.6	5.4	7.2	8.4	7.1	7.4	7.1	6.2	7.8	6.9	6.5	7.7	7.7	7.3	6.8
2-Mar-06	20	5:45	2	7.3	5.8	7.1	8.1	7.0	7.5	6.8	6.2	7.7	7.2	5.1	8.5	3.7	7.7	6.8
2-Mar-06	20	5:45	3	6.7	4.3	6.8	8.1	7.5	6.1	7.5	6.8	7.4	7.1	5.4	8.2	6.8	8.0	7.0
2-Mar-06	20	5:45	4	6.9	6.1	7.0	6.2	7.3	6.3	7.0	5.0	7.3	7.5	6.9	8.4	3.6	8.3	7.3
2-Mar-06	20	5:45	5	5.1	3.5	7.2	7.0	7.0	6.6	7.2	5.5	7.1	5.4	6.3	8.3	4.7	6.0	7.0
2-Mar-06	20	5:45	6	4.5	4.0	5.9	7.3	7.2	6.7	6.5	4.1	7.1	7.3	6.2	7.4	4.8	6.9	7.6
2-Mar-06	20	5:45	7	5.4	6.2	6.9	7.0	7.7	6.4	6.7	4.9	7.4	7.1	6.4	7.7	5.0	6.0	7.9
2-Mar-06	20	5:45	8	7.3	3.6	6.6	7.3	7.1	6.9	6.6	4.7	6.0	7.3	6.6	7.9	6.4	6.4	7.8
			Average	**6.6**	**5.3**	**6.4**	**6.5**	**5.6**	**5.6**	**6.0**	**5.8**	**6.5**	**6.7**	**6.1**	**6.9**	**5.7**	**7.2**	**6.4**
			Minimum	2.5	1.2	2.9	3.6	1.9	2.6	1.7	2.8	2.7	4.0	3.0	4.4	2.6	4.9	3.6
			Maximum	9.0	7.8	7.8	8.4	8.3	7.9	8.3	7.9	8.5	8.5	8.5	8.8	8.6	8.6	8.5

Appendix Table 19. Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006.
pH

Date	Day	Time	Rep	Sand	orm Sedime	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
10-Feb-06	0	7:00	1	8.26	7.59	7.60	7.20	7.91	6.86	7.76	8.01	7.24	7.88	7.54	7.77	7.65	7.82	7.80
10-Feb-06	0	7:00	4	8.27	7.43	7.59	7.37	8.01	6.61	7.82	7.93	7.58	7.25	7.63	7.71	7.40	7.82	7.24
10-Feb-06	0	7:00	5	8.28	7.73	8.06	7.17	7.43	6.81	7.79	7.86	7.58	7.93	7.53	7.96	7.46	7.91	7.80
10-Feb-06	0	7:00	8	8.28	7.98	7.71	7.40	7.53	6.65	7.92	7.90	7.09	7.33	7.39	7.31	7.78	7.68	7.56
13-Feb-06	3	9:00	4	8.19	7.64	7.47	7.95	7.72	7.22	7.28	7.99	7.67	7.89	7.58	7.98	7.83	7.97	7.80
13-Feb-06	3	9:00	7	8.09	7.80	7.64	7.77	7.48	7.94	7.41	7.62	8.00	7.77	7.62	7.91	7.91	7.90	7.96
16-Feb-06	6	8:00	4	7.86	7.53	7.38	7.35	7.34	7.21	7.47	7.30	7.39	7.39	7.47	7.65	7.38	7.46	7.68
16-Feb-06	6	8:00	5	7.57	7.57	7.38	7.41	6.95	7.52	7.58	7.32	7.46	7.42	7.55	7.72	7.45	7.37	7.74
18-Feb-06	8	7:00	4	8.48	8.11	7.79	7.90	7.80	7.65	8.16	7.65	8.08	7.68	8.13	8.05	7.59	8.19	8.00
18-Feb-06	8	7:00	6	7.74	8.02	7.76	8.02	7.91	8.17	7.78	7.55	7.77	7.59	7.97	7.98	7.86	8.15	8.10
23-Feb-06	13	9:00	4	8.33	7.92	7.98	7.98	7.42	7.24	7.50	7.66	8.13	7.96	8.09	8.05	7.93	8.22	7.87
23-Feb-06	13	9:00	6	7.98	7.76	7.93	8.82	7.44	8.15	7.45	7.52	8.10	8.01	7.81	7.77	7.20	8.22	8.13
27-Feb-06	17	10:00	4	8.44	7.38	8.04	8.10	8.17	7.65	7.80	7.53	8.10	8.07	7.99	7.89	7.55	8.19	8.07
27-Feb-06	17	10:00	6	8.41	7.33	8.08	8.07	8.02	8.12	7.77	7.45	7.77	8.18	7.64	8.06	7.64	8.06	8.02
2-Mar-06	20	5:45	1	8.12	7.56	7.92	7.84	8.05	7.69	8.06	7.67	7.91	7.41	7.75	7.72	7.71	7.73	7.81
2-Mar-06	20	5:45	4	8.07	7.52	7.91	7.70	8.11	7.81	8.08	7.50	7.99	7.50	8.06	8.05	7.34	8.10	7.91
2-Mar-06	20	5:45	5	7.60	7.29	7.94	7.96	7.93	7.77	8.05	7.51	7.80	7.43	7.58	7.99	7.43	8.55	7.90
2-Mar-06	20	5:45	8	8.07	7.34	7.61	7.91	7.94	7.83	7.99	7.40	7.60	7.97	7.61	8.03	8.05	7.64	7.98
			Average	**8.11**	**7.64**	**7.77**	**7.77**	**7.73**	**7.49**	**7.76**	**7.63**	**7.74**	**7.70**	**7.72**	**7.87**	**7.62**	**7.94**	**7.85**
			Minimum	7.57	7.29	7.38	7.17	6.95	6.61	7.28	7.30	7.09	7.25	7.39	7.31	7.20	7.37	7.24
			Maximum	8.48	8.11	8.08	8.82	8.17	8.17	8.16	8.01	8.13	8.18	8.13	8.06	8.05	8.55	8.13

Appendix Table 19. Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
10-Feb-06	0	7:00	1	175	183	157	166	189	145	175	161	166	173	158	179	157	165	150
10-Feb-06	0	7:00	8	167	169	157	166	199	150	171	158	161	170	157	160	157	160	150
16-Feb-06	6	8:00	4	150	179	149	148	164	146	159	156	152	160	155	168	151	150	147
16-Feb-06	6	8:00	5	152	179	149	148	172	147	159	157	153	157	154	161	149	155	146
23-Feb-06	13	9:00	4	156	171	146	150	173	157	175	151	155	159	158	151	152	153	154
23-Feb-06	13	9:00	6	155	180	145	150	171	153	177	151	160	157	158	153	152	153	154
2-Mar-06	20	5:45	1	146	165	139	144	149	145	147	141	150	154	149	148	147	146	144
2-Mar-06	20	5:45	8	146	180	137	145	149	145	145	141	150	147	151	146	147	145	143
			Average	**156**	**176**	**147**	**152**	**171**	**148**	**163**	**152**	**156**	**160**	**155**	**158**	**152**	**153**	**148**
			Minimum	146	165	137	144	149	145	145	141	150	147	149	146	147	145	143
			Maximum	175	183	157	166	199	157	177	161	166	173	158	179	157	165	154

Appendix Table 19. Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006.
Ammonia (ppm)_

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
10-Feb-06	0	7:00	1	<0.063	<0.063	0.280	1.488	2.612	<0.063	1.416	0.194	<0.063	0.080	<0.063	<0.063	<0.063	<0.063	<0.063
10-Feb-06	0	7:00	8	<0.063	<0.063	0.208	1.313	6.242	0.068	0.973	0.095	<0.063	0.097	<0.063	<0.063	<0.063	<0.063	<0.063
2-Mar-06	20	5:45	1	0.322	<0.063	0.093	<0.063	0.205	0.097	<0.063	0.078	<0.063	0.280	0.105	0.064	0.269	0.118	0.132
2-Mar-06	20	5:45	8	0.307	<0.063	0.087	<0.063	0.259	0.078	<0.063	0.136	0.140	0.075	0.122	<0.063	0.257	0.180	0.089
			Average	**0.173**	<0.063	**0.167**	**0.716**	**2.330**	**0.069**	**0.613**	**0.126**	**0.059**	**0.133**	**0.073**	**0.040**	**0.147**	**0.090**	**0.071**
			Minimum	<0.063	<0.063	0.087	<0.063	0.205	<0.063	<0.063	0.078	<0.063	0.075	<0.063	<0.063	<0.063	<0.063	<0.063
			Maximum	0.307	<0.063	0.280	1.488	6.242	0.097	1.416	0.194	0.140	0.280	0.122	0.064	0.269	0.180	0.132

Appendix Table 19. Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006.
Alkalinity (mg/L as CaCO3)

Date	Day	Time	Rep	Sand	Form Sediment	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
10-Feb-06	0	7:00	2	53.2	51.2	54.8	63.6	80.8		72.0	56.0	59.8	52.0	58.8	52.0	52.8	55.6	53.2
10-Feb-06	0	7:00	6	53.6	54.2	53.2	60.8	72.0		79.6	60.4	59.8	48.8	63.6	68.8	67.6	55.2	62.0
2-Mar-06	20	5:45	2	56.4	69.2	41.2	53.2	52.8	53.2	54.8	55.2	55.6	53.2	58.8	53.6	56.0	50.8	54.4
2-Mar-06	20	5:45	6	55.6	73.2	53.6	54.0	56.0	52.8	59.6	54.8	56.0	53.2	55.6	53.2	54.0	50.0	52.0
			Average	**54.7**	**62.0**	**50.7**	**57.9**	**65.4**	**53.0**	**66.5**	**56.6**	**57.8**	**51.8**	**59.2**	**56.9**	**57.6**	**52.9**	**55.4**
			Minimum	53.2	51.2	41.2	53.2	52.8	52.8	54.8	54.8	55.6	48.8	55.6	52.0	52.8	50.0	52.0
			Maximum	56.4	73.2	54.8	63.6	80.8	53.2	79.6	60.4	59.8	53.2	63.6	68.8	67.6	55.6	62.0

Appendix Table 19. Water Chemistry Parameters for *C. dilutus* Exposed to Ashland Harbor Sediments, 10 February 2006 to 3 March 2006.
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Sand	orm Sedime	W. Bearskin	SQT9	SQT13	SQT11	SQT14	SQT6	SQT2	SQT7	SQT4	SQT3	SQT5	SQT1	SQT8
10-Feb-06	0	7:00	3	36.4	49.2	52.8	71.6	60.4		58.0	53.6	57.2	60.8	78.8	58.0	54.8	56.4	59.6
10-Feb-06	0	7:00	7	50.4	53.2	54.4	55.2	66.4		66.8	58.0	64.4	52.4	58.8	61.2	54.0	57.6	
2-Mar-06	20	5:45	3	50.0	70.4	44.8	50.4	52.8	49.2	54.4	50.4	54.4	55.7	54.4	51.2	52.4	48.4	49.6
2-Mar-06	20	5:45	7	51.6	63.6	47.6	52.8	56.0	58.8	55.6	51.6	53.6	50.8	56.0	56.4	50.4	46.4	56.4
			Average	**47.1**	**59.1**	**49.9**	**57.5**	**58.9**	**54.0**	**58.7**	**53.4**	**57.4**	**54.9**	**62.0**	**56.7**	**52.9**	**52.2**	**55.2**
			Minimum	36.4	49.2	44.8	50.4	52.8	49.2	54.4	50.4	53.6	50.8	54.4	51.2	50.4	46.4	49.6
			Maximum	51.6	70.4	54.4	71.6	66.4	58.8	66.8	58.0	64.4	60.8	78.8	61.2	54.8	57.6	59.6

APPENDIX 20

Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005

Appendix Table 20. Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005
Temperature (° C)

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
12-Aug-05	0	7:30	1	23.0	23.1	22.9	23.1	23.0	22.8	23.0	22.9	22.8	23.1	23.2	22.7
12-Aug-05	0	7:30	2	24.2	24.0	24.7	24.1	24.0	24.0	23.9	23.9	23.9	24.0	23.8	24.2
12-Aug-05	0	7:30	3	23.0	23.2	22.5	23.1	22.9	23.1	23.1	22.9	23.3	23.0	22.9	23.1
12-Aug-05	0	7:30	4	24.0	24.5	24.6	24.7	24.0	24.2	23.6	24.1	24.1	23.8	23.9	24.2
12-Aug-05	0	14:20	4	23.6	23.9	24.6	23.7	23.8	24.0	23.8	24.0	23.5	23.4	23.7	24.1
13-Aug-05	1	9:45	2	22.2	22.1	22.4	21.3	21.6	22.0	22.3	22.1	21.8	22.1	21.9	22.0
13-Aug-05	1	9:45	4	22.3	21.3	22.2	21.8	21.8	21.8	22.4	22.4	22.0	21.8	21.6	20.9
13-Aug-05	1	16:15	1	20.1	20.3	19.9	20.2	19.9	20.0	19.7	20.1	21.4	20.2	20.6	20.4
13-Aug-05	1	16:15	3	20.0	20.0	20.2	20.1	20.1	20.1	20.0	19.9	20.1	20.0	20.2	20.1
14-Aug-05	2	9:00	2	22.5	22.1	21.5	21.5	21.2	22.6	21.3	21.7	22.2	21.4	21.3	22.5
14-Aug-05	2	9:00	4	22.4	22.6	23.2	22.6	21.1	21.9	21.9	22.3	21.8	21.5	21.4	21.7
14-Aug-05	2	15:50	1	22.0	21.1	21.5	22.1	21.2	22.9	21.4	21.6	22.8	21.9	21.7	21.5
14-Aug-05	2	15:50	3	21.9	21.9	21.3	22.1	22.0	21.4	21.3	21.1	21.3	21.1	21.1	21.6
15-Aug-05	3	8:10	2	23.1	22.8	22.6	22.7	22.6	23.0	22.7	22.5	22.6	22.6	22.7	22.8
15-Aug-05	3	8:10	4	22.8	23.1	23.4	22.9	22.5	22.9	22.6	22.9	22.9	22.8	22.6	22.7
15-Aug-05	3	15:25	1	22.0	21.6	22.0	21.9	21.9	22.6	21.8	22.0	21.7	22.0	22.0	22.1
15-Aug-05	3	15:25	3	22.0	22.0	21.6	21.8	21.5	22.0	22.0	21.9	22.3	21.8	21.6	21.8
16-Aug-05	4	7:45	2	23.3	23.3	23.3	23.3	22.6	23.4	23.1	23.2	22.7	23.2	23.0	22.8
16-Aug-05	4	7:45	4	23.6	23.6	24.1	23.4	22.5	23.3	23.0	22.7	23.3	23.0	23.0	22.5
16-Aug-05	4	15:10	1	22.0	21.7	21.9	22.2	22.1	22.6	21.7	21.9	21.7	22.0	22.1	21.7
16-Aug-05	4	15:10	3	22.1	22.0	21.5	21.9	21.7	2.2	21.8	21.5	222.0	21.9	21.6	21.7
17-Aug-05	5	8:15	2	23.4	22.5	23.3	23.3	23.4	23.5	23.4	23.2	23.2	23.1	23.1	23.4
17-Aug-05	5	8:15	4	23.4	23.5	24.3	23.5	23.1	23.4	23.0	23.1	22.7	23.4	23.5	23.0
17-Aug-05	5	15:25	1	23.4	22.8	22.9	23.4	23.5	23.5	23.4	23.2	23.1	23.4	23.4	22.9
17-Aug-05	5	15:25	3	23.2	23.3	22.4	23.2	23.1	23.2	23.0	22.3	23.7	22.8	22.7	23.0
18-Aug-05	6	8:00	2	23.1	22.8	23.1	22.5	22.0	23.1	22.9	22.6	22.6	22.7	22.7	23.3
18-Aug-05	6	8:00	4	22.9	23.7	23.3	22.8	22.8	23.1	22.9	22.1	23.0	22.6	22.3	22.4
18-Aug-05	6	15:45	1	22.1	21.0	21.3	21.4	21.6	21.4	21.3	21.3	21.2	21.3	21.6	21.0
18-Aug-05	6	15:45	3	21.8	21.5	21.0	21.7	22.2	21.7	21.3	20.8	21.2	21.1	21.0	20.9
19-Aug-05	7	8:30	2	22.1	22.7	21.8	22.4	22.1	22.5	22.1	22.1	21.9	22.1	22.1	22.0
19-Aug-05	7	8:30	4	22.3	22.0	23.2	22.3	22.3	22.4	21.8	21.7	22.2	22.1	22.2	22.0
19-Aug-05	7	15:40	1	23.1	22.4	22.6	22.9	22.9	23.2	22.9	22.6	22.6	22.8	22.8	22.4
19-Aug-05	7	15:40	3	22.8	22.7	22.1	22.8	22.7	22.8	22.6	22.6	23.1	22.5	22.6	22.5
20-Aug-05	8	8:30	2	22.4	22.1	21.9	22.3	22.0	22.3	22.0	22.2	21.9	22.0	22.2	22.3
20-Aug-05	8	8:30	4	22.1	22.6	23.0	22.4	22.2	22.3	21.7	22.2	22.1	22.0	22.0	21.9
20-Aug-05	8	15:45	1	22.6	22.0	22.3	22.3	22.5	22.9	22.1	22.2	21.7	22.0	2.3	21.8
20-Aug-05	8	15:45	3	22.5	22.2	21.8	2.2	22.0	22.3	22.2	22.0	22.3	22.0	21.7	21.9
21-Aug-05	9	9:00	2	22.1	22.0	21.3	21.9	21.9	22.0	21.9	21.2	21.8	22.2	21.7	22.1
21-Aug-05	9	9:00	4	21.6	22.4	22.9	22.3	21.5	21.9	21.6	22.1	22.0	21.9	21.8	22.0
21-Aug-05	9	15:30	1	22.2	21.2	23.1	21.5	21.2	21.9	23.1	21.5	21.6	21.1	21.8	21.1
21-Aug-05	9	15:30	3	21.9	21.3	20.9	21.0	21.6	21.8	21.4	21.0	20.9	21.3	21.1	21.2
22-Aug-05	10	8:30	2	21.7	21.7	21.5	21.8	21.8	21.6	21.8	20.5	21.6	21.7	21.7	21.7
22-Aug-05	10	8:30	4	21.7	21.7	22.6	21.9	21.8	21.6	21.7	21.7	21.4	21.6	21.7	21.7
22-Aug-05	10	15:10	1	22.0	21.3	21.4	22.1	21.8	22.7	21.2	21.8	21.6	21.8	22.0	21.4
22-Aug-05	10	15:10	3	22.2	21.9	21.3	21.6	21.3	21.7	21.8	21.4	22.9	21.3	21.3	21.7

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
23-Aug-05	11	8:00	2	23.3	22.6	22.6	23.2	22.6	22.9	23.3	21.0	22.2	22.7	22.9	22.4
23-Aug-05	11	8:00	4	23.3	23.7	23.2	23.2	22.9	22.6	22.2	22.3	22.4	22.5	22.4	22.8
23-Aug-05	11	14:45	1	23.5	22.1	22.4	23.0	23.2	23.4	22.7	22.5	22.2	22.8	22.9	22.2
23-Aug-05	11	14:45	3	23.2	22.8	22.0	22.7	22.4	23.2	22.4	22.1	23.0	22.2	22.1	22.3
24-Aug-05	12	8:30	2	23.1	23.1	23.6	23.4	23.0	23.3	23.0	21.8	22.7	23.0	23.2	23.1
24-Aug-05	12	8:30	4	23.1	23.1	23.9	23.4	23.0	23.4	22.8	22.8	23.0	22.9	22.9	22.9
24-Aug-05	12	15:20	1	22.6	22.5	23.1	23.6	23.5	24.1	23.3	22.5	23.2	23.4	22.7	22.8
24-Aug-05	12	15:20	3	23.6	23.1	22.5	22.9	23.2	23.1	22.2	21.6	23.2	22.5	22.4	3.2
25-Aug-06	13	8:45	2	23.6	23.4	23.0	23.5	23.4	23.7	23.4	22.1	23.1	23.1	23.3	23.4
25-Aug-06	13	8:45	4	23.4	23.6	23.4	23.3	23.4	23.5	23.5	22.9	23.3	23.3	23.3	23.0
25-Aug-06	13	15:15	1	22.7	22.6	22.7	23.1	23.0	23.3	23.0	22.3	22.4	22.7	22.4	22.3
25-Aug-06	13	15:15	3	23.4	22.8	22.0	22.6	23.0	22.8	22.0	21.2	22.8	22.3	22.0	22.2
26-Aug-05	14	8:15	2	24.1	23.7	23.6	24.0	23.8	23.9	23.7	22.4	23.4	23.7	23.9	24.0
26-Aug-05	14	8:15	4	23.9	23.7	24.5	24.0	23.9	24.0	23.4	23.9	23.7	23.6	23.7	23.6
26-Aug-05	14	15:00	1	22.7	22.7	22.9	22.7	23.0	22.9	22.7	23.0	22.7	22.6	22.4	22.9
26-Aug-05	14	15:00	3	22.9	22.5	23.0	22.5	22.9	22.6	22.9	22.5	22.9	22.9	22.7	22.7
27-Aug-05	15	9:30	2	23.4	22.7	23.0	22.7	22.8	23.0	22.9	21.4	22.5	22.7	22.9	22.9
27-Aug-05	15	9:30	4	23.3	22.3	23.6	22.5	22.9	23.2	22.4	22.9	22.6	22.9	22.6	27.7
27-Aug-05	15	15:00	1	22.5	21.0	22.7	23.2	22.8	22.9	22.4	22.1	22.1	22.6	22.3	21.8
27-Aug-05	15	15:00	3	22.7	22.4	21.4	22.8	22.2	22.4	21.6	21.6	22.5	21.0	21.1	22.2
28-Aug-05	16	9:10	2	23.4	23.8	22.9	22.8	23.0	23.1	23.0	21.5	22.6	22.6	22.9	22.8
28-Aug-05	16	9:10	4	23.4	22.4	23.7	22.2	23.0	23.3	22.5	22.9	22.7	22.7	22.8	22.8
28-Aug-05	16	15:40	1	22.5	22.5	22.1	23.3	22.8	23.4	22.0	21.9	22.1	22.4	21.9	21.8
28-Aug-05	16	15:40	3	23.1	22.1	22.1	22.8	22.5	23.5	22.2	21.8	22.7	22.0	21.8	22.4
29-Aug-05	17	8:10	2	23.2	22.4	22.6	22.9	22.6	22.8	22.6	22.5	22.6	22.5	22.6	22.6
29-Aug-05	17	8:10	4	23.1	22.0	23.2	22.4	22.6	23.0	22.0	22.7	22.3	22.4	22.5	22.6
29-Aug-05	17	15:00	1	23.2	22.6	22.7	23.3	23.1	23.5	22.7	22.9	22.7	22.9	22.8	22.7
29-Aug-05	17	15:00	3	23.3	23.0	22.1	22.7	22.8	23.0	22.7	22.3	22.8	22.5	23.3	22.6
30-Aug-05	18	8:00	2	22.5	22.1	21.2	22.0	22.3	22.5	21.8	22.1	21.9	21.6	21.7	22.0
30-Aug-05	18	8:00	4	22.2	21.9	22.2	22.2	21.7	22.2	22.3	22.2	22.1	22.1	22.0	2.2
30-Aug-05	18	15:00	1	22.0	21.4	21.4	22.2	21.9	22.3	21.0	21.4	21.4	21.7	21.4	21.4
30-Aug-05	18	15:00	3	22.4	21.7	20.7	21.5	21.4	22.0	21.6	21.1	21.4	21.3	21.1	21.2
31-Aug-05	19	9:00	2	23.0	22.6	22.4	23.0	22.9	22.7	22.8	22.1	22.7	22.7	22.8	22.6
31-Aug-05	19	9:00	4	22.9	22.8	22.6	22.8	22.8	23.1	22.6	22.3	22.4	22.8	22.8	22.6
31-Aug-05	19	15:10	1	23.3	22.2	21.9	23.2	23.4	22.7	23.0	22.6	22.9	23.1	22.8	22.0
31-Aug-05	19	15:10	3	23.4	22.7	21.8	23.0	23.1	23.3	22.6	22.1	23.0	21.8	21.8	23.0
1-Sep-05	20	7:00	2	22.4	22.5	22.5	22.5	22.7	22.4	22.7	22.0	22.0	22.4	22.4	22.1
1-Sep-05	20	7:00	4	22.6	22.4	22.4	22.6	22.9	22.7	22.8	22.9	22.2	22.6	22.1	22.4
1-Sep-05	20	15:10	1	23.0	22.2	22.2	22.9	22.7	23.1	22.5	22.1	22.1	22.7	22.4	22.4
1-Sep-05	20	15:10	3	23.1	22.6	22.0	22.7	22.4	22.9	22.3	22.1	22.4	22.3	21.8	22.4
2-Sep-05	21	7:20	2	22.3	22.2	22.5	22.5	22.5	22.5	22.1	22.0	22.2	22.3	22.3	22.1
2-Sep-05	21	7:20	4	22.7	22.2	22.4	22.4	22.4	22.2	22.3	21.6	22.1	22.3	22.2	22.4
2-Sep-05	21	15:15	1	23.0	21.9	22.3	22.9	23.0	22.5	22.2	22.2	22.6	22.8	22.4	22.2
2-Sep-05	21	15:15	3	23.2	22.4	22.1	22.5	22.5	22.7	22.1	21.8	22.6	21.9	21.6	22.1
3-Sep-05	22	9:45	2	21.7	21.7	22.4	21.5	21.9	21.6	22.0	21.5	21.9	21.3	21.2	21.7
3-Sep-05	22	9:45	4	21.1	21.5	22.3	21.6	21.3	21.7	21.6	21.8	21.5	22.1	21.9	21.5
3-Sep-05	22	16:30	1	22.8	21.9	22.1	22.8	22.8	23.0	22.2	22.0	22.3	22.6	22.2	22.1
3-Sep-05	22	16:30	3	22.9	22.5	21.8	22.3	22.4	22.7	22.0	21.8	22.4	22.0	21.6	22.3

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
4-Sep-05	23	8:45	2	23.3	22.7	22.7	23.0	22.7	23.0	22.8	22.9	22.8	22.4	22.5	22.8
4-Sep-05	23	8:45	4	23.1	22.8	21.9	23.0	22.7	23.3	22.5	22.4	22.7	22.7	22.6	22.5
4-Sep-05	23	16:20	1	22.9	22.0	22.1	21.9	22.7	22.8	22.4	22.1	22.1	22.6	22.2	22.3
4-Sep-05	23	16:20	3	22.9	22.5	23.0	22.4	22.4	22.8	22.3	21.9	22.3	22.1	21.8	22.4
6-Sep-05	24	9:00	2	23.4	22.8	22.0	23.1	22.8	23.1	22.9	22.5	22.9	22.2	22.6	23.0
6-Sep-05	24	9:00	4	23.1	22.8	22.8	23.1	22.7	23.3	23.6	23.0	22.7	22.9	22.7	22.7
6-Sep-05	24	14:45	1	23.1	23.0	22.0	22.8	23.2	23.3	22.0	22.8	22.6	22.8	22.6	22.1
6-Sep-05	24	14:45	3	23.3	22.5	21.9	22.5	22.7	22.7	22.2	23.0	22.8	21.9	21.9	22.4
6-Sep-05	25	8:00	2	23.8	23.4	22.7	23.6	23.6	23.8	23.7	23.3	23.6	22.4	23.4	23.6
6-Sep-05	25	8:00	4	23.6	23.5	23.6	23.7	23.4	23.8	23.7	23.6	23.5	23.5	23.6	23.5
6-Sep-05	25	16:05	1	24.2	23.1	23.6	24.1	24.2	24.5	24.2	23.5	24.0	24.1	23.9	23.7
6-Sep-05	25	16:05	3	24.1	23.1	23.6	24.1	24.2	24.1	23.9	23.5	24.3	23.5	23.3	24.1
7-Sep-05	26	8:15	2	23.8	21.6	22.4	23.4	23.1	23.4	23.2	22.9	23.1	22.4	22.8	23.1
7-Sep-05	26	8:15	4	23.4	22.9	23.2	23.3	23.0	23.5	22.9	23.2	22.8	23.1	23.1	23.0
7-Sep-05	26	15:00	1	23.5	21.6	22.4	23.1	23.3	23.8	23.0	22.0	22.8	23.0	22.5	22.4
7-Sep-05	26	15:00	3	23.2	22.9	22.3	23.0	23.0	23.3	22.7	22.1	23.2	21.8	21.7	23.0
8-Sep-05	27	8:00	2	22.8	22.8	22.2	23.0	22.8	23.3	23.1	21.9	22.7	22.1	22.5	22.9
8-Sep-05	27	8:00	4	22.7	23.0	23.1	23.0	22.7	23.3	22.7	22.9	22.8	22.8	22.9	22.7
8-Sep-05	27	14:30	1	22.3	22.1	21.5	22.5	22.6	22.9	21.9	22.3	22.0	22.3	21.8	21.6
8-Sep-05	27	14:30	3	23.1	20.8	21.5	22.1	22.1	22.7	22.2	21.5	22.2	21.0	21.0	22.3
9-Sep-05	28	6:00	1	22.3	22.1	21.7	21.8	21.7	22.0	21.1	21.1	20.9	21.2	20.8	20.6
9-Sep-05	28	6:00	2	23.1	22.7	21.7	22.6	22.6	22.0	22.3	21.7	22.0	21.6	21.7	22.1
9-Sep-05	28	6:00	3	22.2	21.3	20.7	21.5	21.5	21.9	21.0	20.5	21.1	20.1	20.0	21.3
9-Sep-05	28	6:00	4	22.9	22.7	22.6	22.5	22.2	22.9	22.3	22.2	22.1	22.1	22.0	22.1
			Average	**22.8**	**22.4**	**22.4**	**22.5**	**22.5**	**22.6**	**22.4**	**22.2**	**24.2**	**22.3**	**22.1**	**22.1**
			Minimum	20.0	20.0	19.9	2.2	19.9	2.2	19.7	19.9	20.1	20.0	2.3	2.2
			Maximum	24.2	24.5	24.7	24.7	24.2	24.5	24.2	24.1	222.0	24.1	23.9	27.7

Appendix Table 20. Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005.
Dissolved Oxygen (mg/L)

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
12-Aug-05	0	7:30	1	7.0	5.4	0.7	0.6	0.7	0.5	6.1	0.6	0.7	3.1	3.3	0.9
12-Aug-05	0	7:30	2	6.8	5.0	0.4	0.7	0.7	0.6	5.7	4.1	3.4	1.9	3.2	1.9
12-Aug-05	0	7:30	3	6.9	5.7	0.5	0.6	0.9	0.6	5.2	0.9	1.6	1.3	4.0	2.4
12-Aug-05	0	7:30	4	7.2	5.8	0.6	0.9	0.6	0.6	5.8	1.2	4.5	1.2	3.5	0.6
12-Aug-05	0	14:20	4	6.4	5.9	1.0	0.5	0.8	0.9	5.5	2.5	5.0	2.0	5.0	0.7
13-Aug-05	1	9:45	2	6.1	5.3	2.5	1.3	0.8	0.9	5.8	3.9	3.6	2.1	4.5	2.0
13-Aug-05	1	9:45	4	5.7	5.5	2.7	0.5	1.5	0.9	5.2	2.0	5.1	1.0	4.9	3.1
13-Aug-05	1	16:15	1	6.2	5.7	4.1	2.6	4.4	1.7	5.9	3.6	5.6	4.8	5.2	4.9
13-Aug-05	1	16:15	3	5.6	6.0	3.0	3.4	1.9	1.9	5.0	4.1	5.3	3.9	4.6	4.9
14-Aug-05	2	9:00	2	5.8	5.8	3.5	0.6	0.9	2.7	5.1	4.5	4.5	4.9	4.8	5.4
14-Aug-05	2	9:00	4	5.6	5.1	2.3	0.5	2.6	2.5	5.1	3.5	4.3	47.0	4.9	4.9
14-Aug-05	2	15:50	1	5.6	5.6	3.4	1.8	5.4	2.5	5.8	3.8	4.4	4.2	4.3	4.6
14-Aug-05	2	15:50	3	4.8	5.5	3.3	1.6	4.1	3.7	5.1	4.1	4.4	3.7	4.9	5.3
15-Aug-05	3	8:10	2	4.7	5.3	3.6	0.6	3.2	2.7	4.5	4.9	3.9	4.3	3.1	4.6
15-Aug-05	3	8:10	4	6.0	5.4	3.3	0.5	1.5	1.4	4.2	3.6	4.1	3.5	3.4	4.1
15-Aug-05	3	15:25	1	5.1	5.9	3.6	2.1	4.3	2.3	5.2	3.8	3.4	3.7	3.8	4.4
15-Aug-05	3	15:25	3	5.4	5.7	3.1	2.1	4.7	2.8	4.7	3.8	3.9	3.4	4.6	4.7
16-Aug-05	4	7:45	2	7.2	7.9	7.3	6.8	7.5	7.4	8.0	4.6	7.7	7.4	7.5	8.1
16-Aug-05	4	7:45	4	5.8	7.8	7.6	7.7	7.8	7.6	8.0	7.8	7.0	7.8	7.8	5.5
16-Aug-05	4	15:10	1	7.1	7.7	7.6	7.5	7.3	7.3	7.2	7.1	7.5	7.4	6.8	7.6
16-Aug-05	4	15:10	3	7.5	7.8	7.5	7.0	7.5	4.0	7.5	7.3	5.2	7.0	7.4	7.6
17-Aug-05	5	8:15	2	6.9	7.4	7.4	6.0	7.3	6.8	7.3	5.7	7.2	7.5	7.2	5.7
17-Aug-05	5	8:15	4	4.9	7.4	6.9	6.7	7.0	6.8	5.4	7.2	7.2	7.3	7.2	7.3
17-Aug-05	5	15:25	1	6.2	5.8	6.8	6.2	6.9	5.9	6.7	6.2	6.9	6.8	6.5	7.0
17-Aug-05	5	15:25	3	7.0	7.1	6.9	6.7	7.1	6.9	6.9	6.8	6.6	6.5	7.1	7.0
18-Aug-05	6	8:00	2	7.1	6.9	6.0	7.4	8.2	7.8	7.9	6.6	7.7	8.3	7.3	4.6
18-Aug-05	6	8:00	4	4.3	7.1	6.9	5.8	6.1	7.2	8.0	8.0	8.2	8.0	7.9	7.7
18-Aug-05	6	15:45	1	7.0	8.4	8.1	7.9	8.2	7.7	7.8	7.9	8.5	8.0	7.5	8.1
18-Aug-05	6	15:45	3	8.4	8.6	8.0	7.5	8.0	7.3	7.7	8.0	7.6	6.9	4.9	8.2
19-Aug-05	7	8:30	2	7.4	7.5	7.7	0.8	7.6	7.6	7.9	6.4	7.7	7.9	7.4	7.7
19-Aug-05	7	8:30	4	2.2	8.0	7.7	7.5	7.8	7.3	8.0	7.9	7.4	7.6	7.7	8.0
19-Aug-05	7	15:40	1	6.4	7.5	7.2	7.1	7.2	7.0	7.5	7.1	7.3	7.2	6.8	7.4
19-Aug-05	7	15:40	3	7.4	7.6	7.3	7.1	7.4	7.3	7.3	5.7	6.8	6.4	6.7	6.9
20-Aug-05	8	8:30	2	7.4	7.5	7.7	6.8	8.2	7.4	7.9	7.4	7.9	7.8	7.7	7.7
20-Aug-05	8	8:30	4	7.6	7.8	7.3	7.7	7.6	7.5	7.8	6.3	7.7	7.9	7.7	8.5
20-Aug-05	8	15:45	1	5.4	7.7	7.3	7.2	7.5	5.6	7.7	6.0	8.0	8.2	7.6	7.8
20-Aug-05	8	15:45	3	7.6	8.1	7.4	7.4	7.7	7.4	7.5	7.3	7.4	6.0	7.8	8.0
21-Aug-05	9	9:00	2	7.4	7.9	8.0	7.5	8.0	8.2	8.2	7.7	7.9	8.0	7.6	8.5
21-Aug-05	9	9:00	4	7.8	7.9	7.9	7.4	7.5	8.1	8.2	7.8	7.5	7.8	8.4	4.4
21-Aug-05	9	15:30	1	5.0	7.9	7.6	7.4	7.7	7.6	7.8	6.2	7.6	7.8	7.4	7.8
21-Aug-05	9	15:30	3	7.7	7.8	7.6	7.5	7.7	7.7	7.6	7.7	7.2	4.2	7.8	7.9

Date	Day	Time	Rep	Form Sed	W. Bearskir	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
22-Aug-05	10	8:30	2	7.4	8.1	8.1	7.5	8.0	8.0	7.6	7.5	7.5	7.8	7.6	8.2
22-Aug-05	10	8:30	4	7.8	8.2	7.5	7.6	7.5	7.8	5.8	8.0	7.8	7.8	7.9	6.1
22-Aug-05	10	15:10	1	5.6	8.0	7.7	8.0	7.7	8.3	7.7	7.5	8.1	7.7	7.3	8.4
22-Aug-05	10	15:10	3	7.3	7.7	7.7	8.0	8.1	7.8	8.4	7.5	6.2	7.7	7.7	7.7
23-Aug-05	11	8:00	2	7.3	8.2	7.8	8.0	8.7	8.3	8.5	8.3	7.6	8.5	7.5	8.4
23-Aug-05	11	8:00	4	6.6	8.4	7.9	7.7	8.0	8.6	8.1	8.3	8.0	8.5	8.1	8.7
23-Aug-05	11	14:45	1	4.7	7.5	8.0	7.1	7.3	8.4	7.6	7.6	8.4	7.7	7.8	7.3
23-Aug-05	11	14:45	3	6.6	6.4	7.5	7.5	7.5	7.8	7.8	7.8	7.0	7.6	6.1	7.7
24-Aug-05	12	8:30	2	7.2	7.6	7.5	7.7	8.0	8.6	8.0	7.7	7.6	7.5	7.7	7.8
24-Aug-05	12	8:30	4	1.5	7.8	7.7	7.3	8.1	7.8	8.3	7.8	7.6	7.9	7.9	7.7
24-Aug-05	12	15:20	1	7.1	7.7	7.5	2.9	7.3	7.0	7.3	7.3	7.3	7.4	7.4	7.6
24-Aug-05	12	15:20	3	6.7	7.6	7.7	7.8	7.4	7.6	7.6	7.5	7.3	7.4	7.6	7.1
25-Aug-06	13	8:45	2	7.2	7.0	7.5	7.3	7.1	7.8	7.3	7.3	7.3	7.5	7.3	7.6
25-Aug-06	13	8:45	4	5.4	7.4	7.4	7.3	7.0	7.6	7.9	7.9	7.1	7.9	7.1	7.6
25-Aug-06	13	15:15	1	7.1	7.4	7.7	7.6	7.9	7.5	8.2	7.3	8.5	7.7	8.2	8.4
25-Aug-06	13	15:15	3	6.4	8.3	7.8	8.1	7.6	8.1	8.3	7.5	8.1	7.5	8.5	8.4
26-Aug-05	14	8:15	2	6.9	7.1	7.2	7.0	7.5	7.6	7.6	7.6	7.3	7.2	6.9	6.9
26-Aug-05	14	8:15	4	7.0	7.3	7.1	6.9	7.4	7.4	7.7	7.2	7.5	7.4	7.4	7.4
26-Aug-05	14	15:00	1	7.3	7.0	7.0	7.0	6.8	7.5	7.4	7.5	6.8	8.4	6.8	8.0
26-Aug-05	14	15:00	3	7.6	6.9	6.7	7.4	7.6	8.3	7.0	6.9	7.4	8.0	7.4	6.7
27-Aug-05	15	9:30	2	6.9	7.2	7.4	7.1	7.4	8.1	7.7	7.7	7.1	7.3	7.0	5.7
27-Aug-05	15	9:30	4	7.1	7.5	6.9	7.2	7.3	7.4	8.0	7.6	7.0	7.2	7.9	7.3
27-Aug-05	15	15:00	1	6.9	7.9	8.0	7.7	8.9	6.5	7.9	7.1	7.8	7.5	7.4	8.1
27-Aug-05	15	15:00	3	7.4	7.8	7.9	8.0	7.7	7.4	8.0	7.5	7.4	7.5	7.9	7.8
28-Aug-05	16	9:10	2	7.0	7.3	7.4	7.0	7.4	7.4	7.8	7.8	7.7	7.6	8.0	6.2
28-Aug-05	16	9:10	4	7.0	7.5	7.1	7.0	7.5	7.4	7.8	7.3	7.2	7.9	8.0	7.8
28-Aug-05	16	15:40	1	7.5	7.9	7.8	7.5	7.7	7.4	7.5	6.7	8.3	7.5	7.6	7.8
28-Aug-05	16	15:40	3	7.5	7.5	7.8	7.7	7.4	7.6	7.6	7.6	7.9	7.3	7.8	7.4
29-Aug-05	17	8:10	2	7.1	7.7	8.2	8.0	8.2	8.1	8.2	8.1	7.1	8.3	8.1	7.8
29-Aug-05	17	8:10	4	7.3	7.8	7.9	7.8	7.8	8.0	8.1	8.2	7.9	8.3	8.2	8.1
29-Aug-05	17	15:00	1	6.8	7.7	7.8	7.0	8.0	8.2	7.8	6.9	8.0	8.3	8.2	7.7
29-Aug-05	17	15:00	3	7.0	8.0	8.0	7.6	8.2	8.0	7.8	7.5	7.9	7.7	7.8	7.5
30-Aug-05	18	8:00	2	7.3	7.5	7.5	7.5	7.6	7.7	7.8	6.7	7.5	8.0	8.0	5.5
30-Aug-05	18	8:00	4	1.4	7.6	7.4	7.1	7.7	7.8	7.6	7.7	7.3	8.1	8.0	7.9
30-Aug-05	18	15:00	1	6.8	7.7	7.8	7.7	8.2	8.1	8.0	7.2	7.9	8.2	8.2	7.8
30-Aug-05	18	15:00	3	6.9	7.5	8.0	8.1	8.1	8.1	8.0	7.7	7.9	7.9	8.0	7.8
31-Aug-05	19	9:00	2	6.9	7.3	7.6	6.7	7.5	8.1	8.1	7.8	6.9	7.4	7.6	7.5
31-Aug-05	19	9:00	4	7.2	7.1	7.1	7.3	7.5	7.3	8.2	7.2	7.6	7.6	7.9	8.0
31-Aug-05	19	15:10	1	6.0	7.6	7.8	7.4	7.4	8.0	7.8	7.3	8.0	7.9	7.2	7.9
31-Aug-05	19	15:10	3	6.6	7.8	7.9	8.0	7.5	7.3	7.4	7.3	7.8	7.6	7.5	8.1
1-Sep-05	20	7:00	2	7.3	7.4	5.5	6.7	8.0	7.1	8.0	7.0	7.7	7.6	7.8	7.2
1-Sep-05	20	7:00	4	6.9	7.0	7.3	6.9	7.6	7.6	7.7	7.0	7.9	7.2	7.9	7.6
1-Sep-05	20	15:10	1	5.9	6.9	8.1	7.1	8.0	8.1	7.6	6.5	7.8	8.2	7.5	8.1
1-Sep-05	20	15:10	3	6.7	7.8	7.7	7.6	7.7	7.6	7.8	7.3	8.0	7.4	7.8	8.0
2-Sep-05	21	7:20	2	7.2	7.6	4.8	6.6	7.4	7.2	7.6	7.3	7.0	7.5	7.4	7.6

Date	Day	Time	Rep	Form Sed	W. Bearskir	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
2-Sep-05	21	7:20	4	7.0	7.6	7.3	7.3	7.5	7.6	7.8	7.6	7.4	7.2	7.5	7.5
2-Sep-05	21	15:15	1	6.3	7.5	7.9	7.5	7.5	6.1	7.7	6.8	7.5	7.4	6.7	8.0
2-Sep-05	21	15:15	3	6.6	7.5	8.0	7.4	7.5	7.4	7.8	7.8	7.4	7.5	7.8	7.2
3-Sep-05	22	9:45	2	7.4	7.6	7.9	7.0	7.7	7.8	7.6	7.6	7.3	7.7	7.2	7.7
3-Sep-05	22	9:45	4	7.5	7.8	7.5	7.5	7.0	7.5	8.0	7.7	7.1	7.3	7.6	7.7
3-Sep-05	22	16:30	1	5.8	7.1	7.4	6.7	7.3	6.1	7.7	7.2	8.3	7.9	7.1	8.0
3-Sep-05	22	16:30	3	7.0	7.8	7.6	7.4	7.6	7.5	7.7	7.6	8.3	7.8	7.8	7.5
4-Sep-05	23	8:45	2	7.0	7.5	7.3	6.6	7.5	8.2	7.8	7.7	7.0	5.1	7.4	8.1
4-Sep-05	23	8:45	4	7.1	7.7	7.8	8.0	7.7	7.4	7.7	7.7	7.7	8.2	7.4	7.8
4-Sep-05	23	16:20	1	5.7	7.6	7.8	7.9	7.0	7.8	7.7	6.5	7.8	7.3	7.0	7.5
4-Sep-05	23	16:20	3	7.0	7.6	7.0	7.5	7.7	7.8	7.8	7.5	7.8	7.8	7.6	7.1
6-Sep-05	24	9:00	2	7.6	7.8	7.8	6.4	7.8	7.8	7.8	7.5	7.2	8.0	7.2	7.4
6-Sep-05	24	9:00	4	7.3	7.5	7.1	7.1	7.4	7.3	7.9	7.4	8.0	7.9	7.5	7.6
6-Sep-05	24	14:45	1	7.0	7.4	8.0	7.6	8.0	7.9	7.2	8.2	7.2	8.0	7.3	8.0
6-Sep-05	24	14:45	3	7.5	7.8	8.1	7.5	8.0	7.4	7.6	7.1	8.4	7.7	7.6	8.0
6-Sep-05	25	8:00	2	7.4	7.9	8.1	6.9	7.9	7.7	8.0	7.5	6.7	7.5	7.4	7.2
6-Sep-05	25	8:00	4	7.5	7.6	7.7	7.5	7.7	7.6	8.1	7.2	7.2	7.9	7.4	7.8
6-Sep-05	25	16:05	1	6.0	7.2	6.9	6.8	6.5	7.1	7.3	6.7	7.0	7.0	7.2	6.7
6-Sep-05	25	16:05	3	6.8	7.1	7.1	7.1	6.8	7.3	7.2	6.1	6.8	7.3	7.4	6.8
7-Sep-05	26	8:15	2	7.5	7.7	8.0	6.8	7.4	7.8	7.5	7.4	6.9	8.0	7.3	7.8
7-Sep-05	26	8:15	4	7.2	7.7	7.5	6.5	7.0	7.2	7.5	7.3	7.5	7.2	7.6	8.0
7-Sep-05	26	15:00	1	6.1	7.5	7.9	7.1	7.3	7.1	7.1	7.0	7.2	7.2	7.6	7.9
7-Sep-05	26	15:00	3	6.5	7.7	7.8	7.2	7.2	7.3	7.4	7.0	6.9	7.2	7.6	7.0
8-Sep-05	27	8:00	2	7.1	7.5	7.4	7.1	8.1	7.3	7.6	7.5	7.3	8.1	7.8	7.4
8-Sep-05	27	8:00	4	7.0	7.2	7.1	7.0	7.5	7.2	7.6	8.1	7.5	7.9	7.7	8.0
8-Sep-05	27	14:30	1	6.5	7.3	7.5	6.3	7.0	7.5	7.6	7.0	7.7	7.8	7.6	7.3
8-Sep-05	27	14:30	3	6.5	7.2	7.2	7.8	6.8	7.4	7.2	4.3	7.9	7.9	5.0	7.6
9-Sep-05	28	6:00	1	6.7	8.0	7.9	5.3	7.0	7.1	6.9	7.5	7.5	7.3	6.7	7.5
9-Sep-05	28	6:00	2	6.7	7.2	7.4	6.7	6.7	7.6	7.1	7.0	7.2	7.1	7.0	7.3
9-Sep-05	28	6:00	3	7.2	7.8	7.8	7.5	7.4	7.4	7.2	7.6	7.5	7.5	7.9	7.4
9-Sep-05	28	6:00	4	7.0	7.1	7.3	7.1	6.8	7.0	7.6	7.0	7.8	7.5	7.7	7.5
			Average	**6.6**	**7.3**	**6.8**	**6.3**	**6.8**	**6.7**	**7.3**	**6.7**	**7.0**	**7.3**	**7.0**	**6.9**
			Minimum	1.4	5.0	0.4	0.5	0.6	0.5	4.2	0.6	0.7	1.0	3.1	0.6
			Maximum	8.4	8.6	8.2	8.1	8.9	8.6	8.5	8.3	8.5	47.0	8.5	8.7

Appendix Table 20. Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005.
pH

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
12-Aug-05	0	7:30	4	6.73	7.39	7.21	7.12	7.18	7.28	7.58	7.03	7.26	7.16	7.21	6.84
15-Aug-05	3	8:10	4	7.43	7.28	7.23	7.72	6.90	7.22	7.37	7.19	7.32	7.33	7.31	7.28
18-Aug-05	6	8:00	1	7.86	7.98	7.90	8.02	7.92	8.05	7.97	7.81	7.94	8.01	7.96	8.01
20-Aug-05	8	8:30	2	8.03	8.03	8.02	8.23	8.00	8.02	8.09	7.59	7.82	7.99	7.91	7.98
22-Aug-05	10	8:30	3	8.10	8.05	7.93	8.05	7.99	8.21	8.06	7.91	7.74	8.04	7.54	7.86
25-Aug-06	13	8:45	4	8.18	8.09	7.99	8.00	7.97	8.19	8.07	7.96	7.69	8.00	7.60	7.89
27-Aug-05	15	9:30	1	8.01	7.92	7.94	8.04	7.89	7.85	7.99	7.79	8.08	8.07	8.04	8.07
29-Aug-05	17	8:10	2	8.05	8.04	8.00	8.15	7.97	8.11	8.14	7.99	8.08	8.05	8.03	7.73
1-Sep-05	20	7:00	3	7.94	8.00	8.05	7.99	7.88	8.08	8.12	8.11	8.06	8.09	8.18	8.01
3-Sep-05	22	9:45	4	8.08	7.98	7.94	8.21	7.75	8.08	8.18	8.02	8.01	8.05	8.10	8.07
9-Sep-05	28	6:00	4	7.94	7.73	7.80	7.87	7.64	7.98	8.00	7.92	8.00	8.08	8.20	8.00
			Average	**7.9**	**7.9**	**7.8**	**7.9**	**7.7**	**7.9**	**8.0**	**7.8**	**7.8**	**7.9**	**7.8**	**7.8**
			Minimum	6.7	7.3	7.2	7.1	6.9	7.2	7.4	7.0	7.3	7.2	7.2	6.8
			Maximum	8.2	8.1	8.1	8.2	8.0	8.2	8.2	8.1	8.1	8.1	8.2	8.1

Appendix Table 20. Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005.
Conductivity (µmhos/cm)

Date	Day	Time	Rep	Form Sed	W. Bearskir	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
12-Aug-05	0	7:30	4	187	119	152	398	102	147	117	113	119	206	120	98
18-Aug-05	6	8:00	1	175	110	108	125	104	272	123	122	114	114	115	108
25-Aug-06	13	8:45	4	120	110	110	127	107	181	124	121	113	118	117	113
1-Sep-05	20	7:00	3	151	116	121	143	89	145	119	124	109	135	126	117
9-Sep-05	28	6:00	4	149	109	114	147	107	127	126	119	148	168	142	129
			Average	**156**	**113**	**121**	**188**	**102**	**174**	**122**	**120**	**121**	**148**	**124**	**113**
			Minimum	120	109	108	125	89	127	117	113	109	114	115	98
			Maximum	187	119	152	398	107	272	126	124	148	206	142	129

Appendix Table 20. Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005.
Ammonia (ppm)

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
12-Aug-05	0	7:30	1	0.157	0.588	0.297	8.561	<0.063	3.294	0.311	<0.063	<0.063	<0.063	<0.063	<0.063
9-Sep-05	28	6:00	1	<0.063	0.111	0.096	0.172	<0.063	<0.063	0.114	<0.063	0.078	0.072	<0.063	<0.063
			Average	0.094	0.350	0.197	4.367	<0.063	1.663	0.213	<0.063	0.055	0.052	<0.063	<0.063
			Minimum	<0.063	0.111	0.096	0.172	<0.063	<0.063	0.114	<0.063	<0.063	<0.063	<0.063	<0.063
			Maximum	0.157	0.588	0.297	8.561	<0.063	3.294	0.311	<0.063	0.078	0.072	<0.063	<0.063

Appendix Table 20. Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005.
Hardness (mg/L as CaCO3)

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
12-Aug-05	0	7:30	3	32.4	46.4	65.6	98.8		58.4	52.4					
9-Sep-05	28	6:00	3	71.6	42	45.2	54.8	36.4	55.6	46	48.8	48.4	56.4	53.6	45.6
			Average	52.0	44.2	55.4	76.8	36.4	57.0	49.2	48.8	48.4	56.4	53.6	45.6
			Minimum	32.4	42.0	45.2	54.8	36.4	55.6	46.0	48.8	48.4	56.4	53.6	45.6
			Maximum	71.6	46.4	65.6	98.8	36.4	58.4	52.4	48.8	48.4	56.4	53.6	45.6

Appendix Table 20. Water Chemistry Parameters for *Lumbriculus variegatus* Exposed to Ashland Harbor Sediments, 12 August 2005.
Alkalinity (mg/L as CaCO3)

Date	Day	Time	Rep	Form Sed	W. Bearskin	SQT9	SQT10	SQT11	SQT12	SQT6	SQT2	SQT4	SQT3	SQT5	SQT8
12-Aug-05	0	7:30	2	38.4	42	62	75.6		63.2	54	56.4	55.2	65.6	78.8	52.4
9-Sep-05	28	6:00	2	73.2	46	55.2	54	47.6	54.4	55.6	52.4	60.4	54.8	95.6	50
			Average	55.8	44.0	58.6	64.8	47.6	58.8	54.8	54.4	57.8	60.2	87.2	51.2
			Minimum	38.4	42.0	55.2	54.0	47.6	54.4	54.0	52.4	55.2	54.8	78.8	50.0
			Maximum	73.2	46.0	62.0	75.6	47.6	63.2	55.6	56.4	60.4	65.6	95.6	52.4

APPENDIX 21

Water Chemistry Parameters for Equilibrium Study

Appendix Table 21. Water Chemistry Parameters for Equilibrium Study
Temperature (° C)

Date	Day	Time	Rep	SQT7	SQT8
2-Aug-05	0	8:00	1	23.5	23.6
2-Aug-05	0	8:00	2	23.6	23.7
2-Aug-05	0	8:00	3	23.6	23.7
2-Aug-05	0	8:00	4	23.7	23.7
2-Aug-05	0	8:00	5	23.6	23.7
2-Aug-05	0	8:00	6	23.7	23.7
2-Aug-05	0	8:00	7	23.7	23.6
2-Aug-05	0	8:00	8	23.7	23.6
2-Aug-05	0	16:45	1	23.8	23.9
2-Aug-05	0	16:45	4	23.9	23.9
3-Aug-05	1	8:30	4	23.6	23.6
3-Aug-05	1	8:30	6	23.6	23.7
3-Aug-05	1	15:10	4	23.9	24.0
3-Aug-05	1	15:10	8	23.9	24.0
4-Aug-05	2	8:45	4	23.3	23.3
4-Aug-05	2	8:45	5	23.3	23.1
4-Aug-05	2	15:00	2	23.1	23.1
4-Aug-05	2	15:00	4	23.1	23.1
5-Aug-05	3	8:00	4	19.7	19.8
5-Aug-05	3	8:00	7	19.8	19.7
5-Aug-05	3	15:00	3	22.4	22.4
5-Aug-05	3	15:00	4	22.4	22.5
6-Aug-05	4	9:00	1	23.8	23.9
6-Aug-05	4	9:00	4	23.8	23.9
7-Aug-05	5	7:45	4	23.4	23.4
7-Aug-05	5	7:45	6	23.5	23.4
7-Aug-05	5	15:15	4	23.9	23.9
7-Aug-05	5	15:15	8	23.9	23.9
8-Aug-05	6	9:00	4	23.6	23.7
8-Aug-05	6	9:00	5	23.6	23.6
8-Aug-05	6	15:45	2	23.7	23.7
8-Aug-05	6	15:45	4	23.7	23.7
9-Aug-05	7	9:00	4	23.4	23.4
9-Aug-05	7	9:00	7	23.3	23.5
9-Aug-05	7	14:45	3	24.0	24.1
9-Aug-05	7	14:45	4	24.0	24.0
10-Aug-05	8	7:45	4	23.1	23.1
10-Aug-05	8	7:45	6	23.1	23.1
10-Aug-05	8	15:20	4	23.4	23.5
10-Aug-05	8	15:20	8	23.4	23.5
11-Aug-05	9	6:00	4	21.7	21.7
11-Aug-05	9	6:00	7	21.7	21.8
12-Aug-05	10	6:25	4	23.3	23.3
12-Aug-05	10	6:25	5	23.2	23.4
12-Aug-05	10	14:00	2	22.8	23.2
12-Aug-05	10	14:00	4	22.9	23.2
13-Aug-05	11	9:00	4	21.0	23.0
13-Aug-05	11	9:00	7	20.9	23.0

Date	Day	Time	Rep	SQT7	SQT8
13-Aug-05	11	9:00	3	21.8	21.8
13-Aug-05	11	9:00	4	21.6	22.1
14-Aug-05	12	8:45	1	20.2	20.5
14-Aug-05	12	8:45	4	20.4	20.2
14-Aug-05	12	15:30	4	21.2	21.3
14-Aug-05	12	15:30	5	21.2	21.3
15-Aug-05	13	7:30	4	21.0	22.4
15-Aug-05	13	7:30	6	22.4	22.5
15-Aug-05	13	15:15	4	22.4	23.2
15-Aug-05	13	15:15	8	22.8	22.1
16-Aug-05	14	8:30	4	22.5	22.7
16-Aug-05	14	8:30	5	22.6	22.6
16-Aug-05	14	15:00	2	23.1	23.4
16-Aug-05	14	15:00	4	23.1	23.4
17-Aug-05	15	8:10	4	23.1	23.2
17-Aug-05	15	8:10	7	23.0	23.2
17-Aug-05	15	15:10	3	23.3	23.5
17-Aug-05	15	15:10	4	23.3	23.5
18-Aug-05	16	7:00	1	23.1	23.2
18-Aug-05	16	7:00	4	23.0	23.3
18-Aug-05	16	15:45	4	22.3	22.6
18-Aug-05	16	15:45	5	22.0	22.5
19-Aug-05	17	8:00	4	22.6	22.7
19-Aug-05	17	8:00	6	22.6	22.8
19-Aug-05	17	15:30	4	23.2	23.3
19-Aug-05	17	15:30	8	23.2	23.4
20-Aug-06	18	8:30	4	22.2	23.2
20-Aug-06	18	8:30	5	22.4	23.1
20-Aug-06	18	16:05	2	22.7	22.8
20-Aug-06	18	16:05	4	22.6	22.8
21-Aug-05	19	8:45	4	22.1	22.2
21-Aug-05	19	8:45	7	22.2	22.3
21-Aug-05	19	15:25	3	22.6	22.6
21-Aug-05	19	15:25	4	22.6	22.6
22-Aug-05	20	8:10	1	22.0	22.2
22-Aug-05	20	8:10	4	21.9	22.0
22-Aug-05	20	15:00	2	23.1	23.3
22-Aug-05	20	15:00	4	23.1	23.3
23-Aug-05	21	7:30	4	23.0	22.9
23-Aug-05	21	7:30	6	22.9	23.2
23-Aug-05	21	14:45	4	23.3	23.4
23-Aug-05	21	14:45	8	23.3	23.4
24-Aug-05	22	8:30	4	23.1	23.3
24-Aug-05	22	8:30	5	23.1	23.2
24-Aug-05	22	15:15	2	22.9	22.0
24-Aug-05	22	15:15	4	22.9	23.1
25-Aug-05	23	8:15	4	22.8	22.9
25-Aug-05	23	8:15	7	22.6	23.1
			Average	22.8	23.0
			Minimum	19.7	19.7
			Maximum	24.0	24.1

Appendix Table 21. Water Chemistry Parameters for Equilibrium Study
Dissolved Oxygen (mg/L)

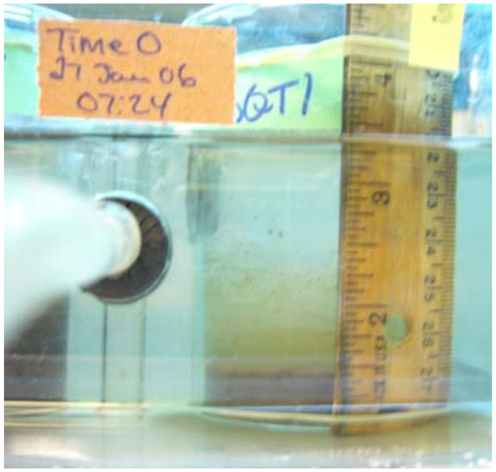
Date	Day	Time	Rep	SQT7	SQT8
2-Aug-05	0	8:00	1	5.0	4.1
2-Aug-05	0	8:00	2	5.0	5.1
2-Aug-05	0	8:00	3	6.7	5.0
2-Aug-05	0	8:00	4	5.4	4.7
2-Aug-05	0	8:00	5	4.5	5.1
2-Aug-05	0	8:00	6	4.1	5.4
2-Aug-05	0	8:00	7	5.4	6.2
2-Aug-05	0	8:00	8	6.5	6.3
2-Aug-05	0	16:45	1	5.9	4.2
2-Aug-05	0	16:45	4	4.7	3.7
3-Aug-05	1	8:30	4	4.5	4.3
3-Aug-05	1	8:30	6	4.2	4.6
3-Aug-05	1	15:10	4	4.5	5.1
3-Aug-05	1	15:10	8	6.3	4.2
4-Aug-05	2	8:45	4	4.3	4.8
4-Aug-05	2	8:45	5	4.3	3.7
4-Aug-05	2	15:00	2	6.2	4.9
4-Aug-05	2	15:00	4	5.3	6.7
5-Aug-05	3	8:00	4	5.1	6.7
5-Aug-05	3	8:00	7	6.5	5.4
5-Aug-05	3	15:00	3	6.8	5.1
5-Aug-05	3	15:00	4	5.6	6.9
6-Aug-05	4	9:00	1	6.4	4.5
6-Aug-05	4	9:00	4	6.0	6.4
7-Aug-05	5	7:45	4	6.2	6.0
7-Aug-05	5	7:45	6	3.4	5.6
7-Aug-05	5	15:15	4	5.2	5.0
7-Aug-05	5	15:15	8	5.5	5.9
8-Aug-05	6	9:00	4	5.3	5.6
8-Aug-05	6	9:00	5	4.5	4.3
8-Aug-05	6	15:45	2	6.4	5.8
8-Aug-05	6	15:45	4	6.1	6.5
9-Aug-05	7	9:00	4	6.9	7.1
9-Aug-05	7	9:00	7	6.8	7.1
9-Aug-05	7	14:45	3	6.7	5.3
9-Aug-05	7	14:45	4	5.9	6.7
10-Aug-05	8	7:45	4	6.5	6.6
10-Aug-05	8	7:45	6	6.1	6.0
10-Aug-05	8	15:20	4	6.8	5.5
10-Aug-05	8	15:20	8	6.1	6.8
11-Aug-05	9	6:00	4	6.6	6.7
11-Aug-05	9	6:00	7	6.9	6.1
12-Aug-05	10	6:25	4	6.4	6.8
12-Aug-05	10	6:25	5	3.7	6.0
12-Aug-05	10	14:00	2	6.9	6.1
12-Aug-05	10	14:00	4	6.8	6.3
13-Aug-05	11	9:00	4	7.4	5.9
13-Aug-05	11	9:00	7	5.6	6.2

Date	Day	Time	Rep	SQT7	SQT8
13-Aug-05	11	9:00	3	6.7	5.8
13-Aug-05	11	9:00	4	7.6	6.2
14-Aug-05	12	8:45	1	6.5	5.7
14-Aug-05	12	8:45	4	7.2	5.9
14-Aug-05	12	15:30	4	6.4	7.1
14-Aug-05	12	15:30	5	3.0	7.0
15-Aug-05	13	7:30	4	6.8	7.1
15-Aug-05	13	7:30	6	3.8	7.3
15-Aug-05	13	15:15	4	6.8	7.0
15-Aug-05	13	15:15	8	6.7	7.1
16-Aug-05	14	8:30	4	7.1	7.3
16-Aug-05	14	8:30	5	3.3	6.8
16-Aug-05	14	15:00	2	7.3	7.0
16-Aug-05	14	15:00	4	6.4	7.1
17-Aug-05	15	8:10	4	6.4	6.6
17-Aug-05	15	8:10	7	6.8	7.0
17-Aug-05	15	15:10	3	7.0	7.1
17-Aug-05	15	15:10	4	6.1	6.8
18-Aug-05	16	7:00	1	6.9	7.4
18-Aug-05	16	7:00	4	5.9	6.9
18-Aug-05	16	15:45	4	6.9	7.1
18-Aug-05	16	15:45	5	6.5	7.7
19-Aug-05	17	8:00	4	6.7	7.1
19-Aug-05	17	8:00	6	7.1	7.5
19-Aug-05	17	15:30	4	7.4	7.1
19-Aug-05	17	15:30	8	7.2	7.1
20-Aug-06	18	8:30	4	8.1	6.5
20-Aug-06	18	8:30	5	7.8	6.9
20-Aug-06	18	16:05	2	7.6	8.0
20-Aug-06	18	16:05	4	7.7	7.9
21-Aug-05	19	8:45	4	7.8	8.0
21-Aug-05	19	8:45	7	7.2	7.8
21-Aug-05	19	15:25	3	8.0	8.2
21-Aug-05	19	15:25	4	7.9	8.1
22-Aug-05	20	8:10	1	8.3	8.3
22-Aug-05	20	8:10	4	7.6	8.4
22-Aug-05	20	15:00	2	7.4	7.5
22-Aug-05	20	15:00	4	7.2	7.5
23-Aug-05	21	7:30	4	6.9	7.0
23-Aug-05	21	7:30	6	7.4	7.6
23-Aug-05	21	14:45	4	7.5	7.9
23-Aug-05	21	14:45	8	7.7	7.9
24-Aug-05	22	8:30	4	7.6	7.7
24-Aug-05	22	8:30	5	5.0	7.4
24-Aug-05	22	15:15	2	7.4	7.8
24-Aug-05	22	15:15	4	7.3	7.6
25-Aug-05	23	8:15	4	7.1	7.4
25-Aug-05	23	8:15	7	7.3	7.9
			Average	6.3	6.4
			Minimum	3.0	3.7
			Maximum	8.3	8.4

APPENDIX 22

Suspended Sediment Photos

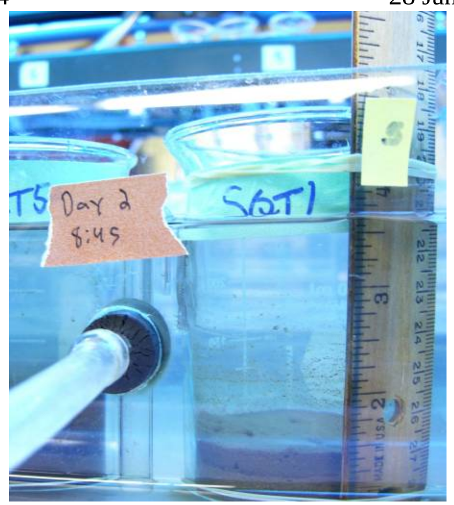
SQT1



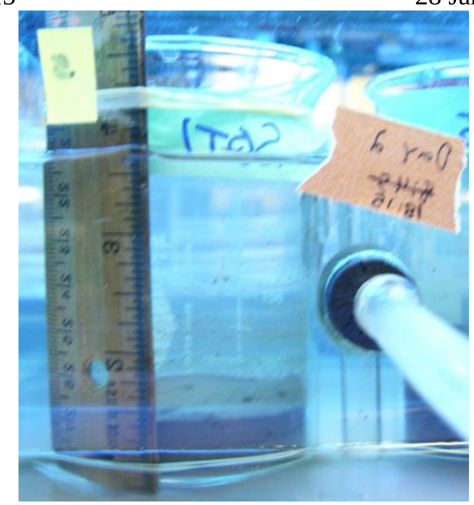
Day 0
27 Jan 06 at 7:24

Day 1
28 Jan 06 at 9:15

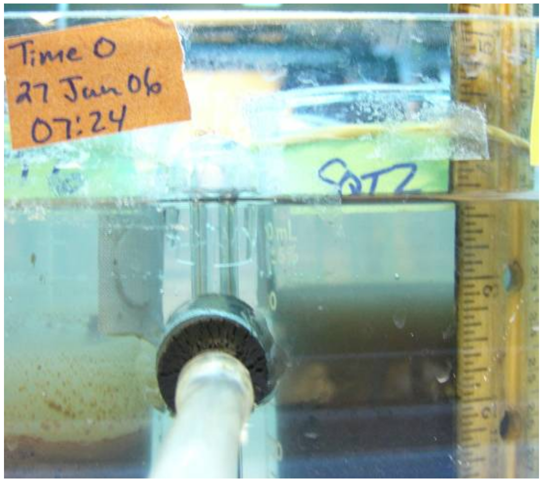
Day 1
28 Jan 06 at 16:15



Day 2
29 Jan 06 at 8:45


Day 2
29 Jan 06 at 18:15

SQT2



Day 0
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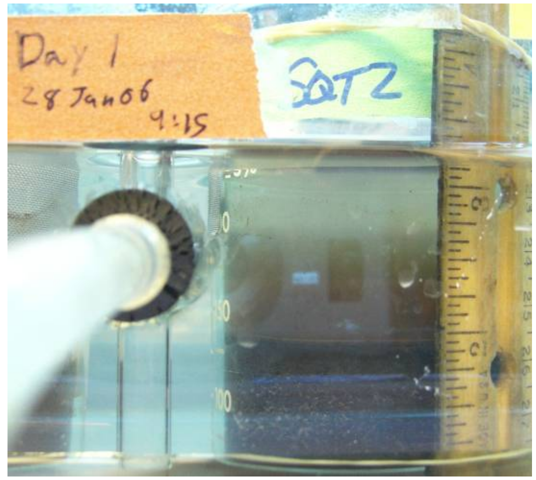
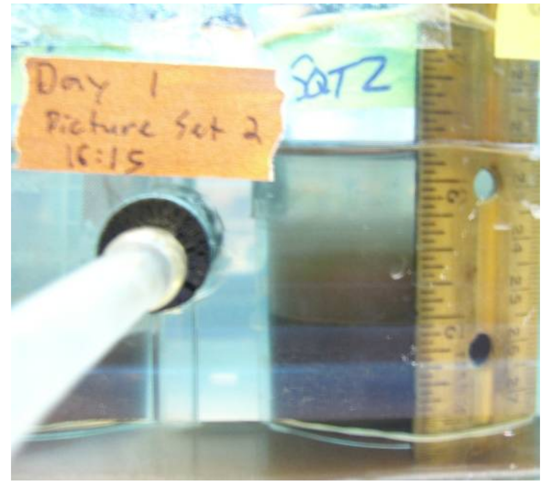


Day 1
28 Jan 06 at 9:15

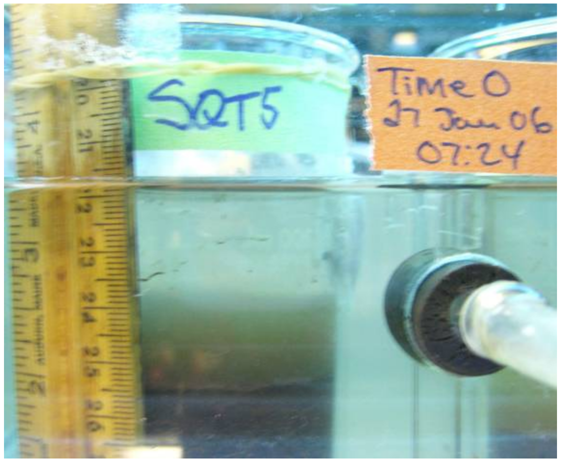


Day 1
28 Jan 06 at 16:15

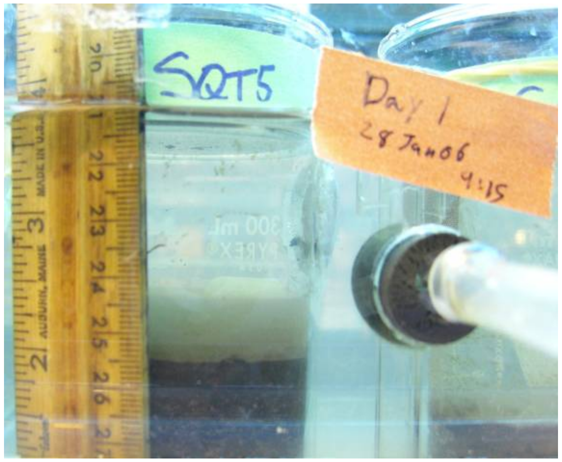
Day 2
29 Jan 06 at 8:45

Day 2
29 Jan 06 at 18:15

SQT5



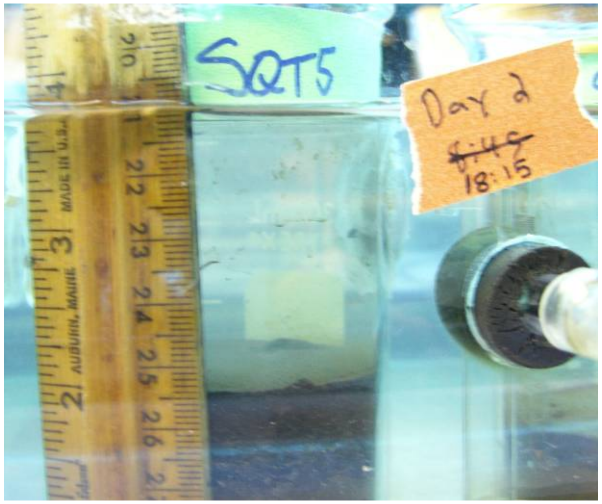
Day 0
27 Jan 06 at 7:24



Day 1
28 Jan 06 at 9:15

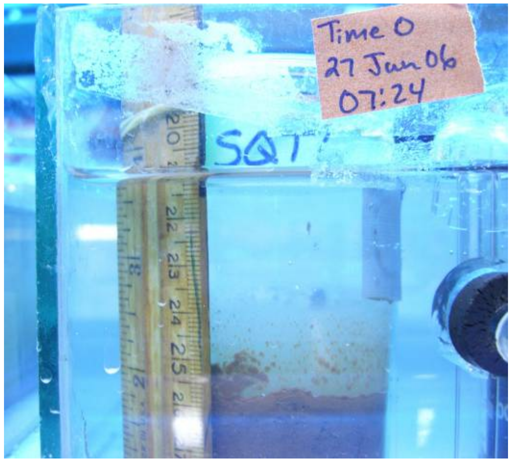
Day 1
28 Jan 06 at 16:15

Day 2
29 Jan 06 at 8:45

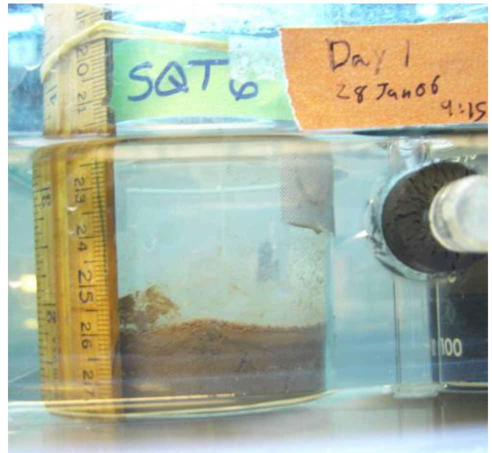


Day 2
29 Jan 06 at 18:15

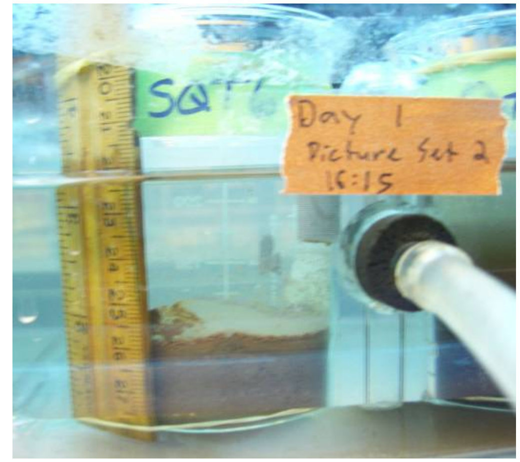
SQT6



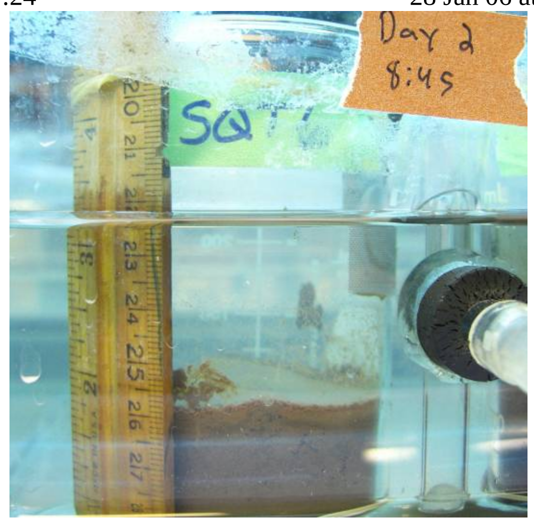
Day 0
27 Jan 06 at 7:24



Day 1
28 Jan 06 at 9:15



Day 1
28 Jan 06 at 16:15



Day 2
29 Jan 06 at 8:45

Day 2
29 Jan 06 at 18:15

APPENDIX 23

Field UV Measurements

Samples collected 31 August 2005

UVA Sunny (microWatts/cm2)

Site SQT2 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	928	1219	1046	940	1033.3	134.7
2 cm	815	1117	997	888	954.3	131.8
mid	97.5	105.2	106.4	116	106.3	7.6
bottom	15.1	11.1	15.6	15.6	14.4	2.2

Site SQT2 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	2090	2530	2460	2740	2455.0	270.9
2 cm	2350	2130	2100	1967	2136.8	158.8
mid	216	175	193	153	184.3	26.8
bottom	31.1	31.8	31.8	30.8	31.4	0.5

Site SQT2 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	3890	3690	3900	3890	3842.5	101.8
2 cm	2888	3000	3010	2760	2914.5	116.9
mid	270	280	284	248	270.5	16.1
bottom	36	37.7	25.4	26.8	31.5	6.3

Site SQT2 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	2310	1577	2510	2320	2179.3	411.9
2 cm	2260	2220	2090	1697	2066.8	257.0
mid	102		117	170	129.7	35.7
bottom	0.101		21.8	27.2	16.4	14.3

Site SQT2 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	357	341	334	353	346.3	10.6
2 cm	269	274	277	252	268.0	11.2
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

UVB Sunny (microWatts/cm2)

Site SQT2 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	159.6	137.2	136.2	150.9	146.0	11.3
2 cm	120.8	116.1	125.7	112.3	118.7	5.8
mid	3.23	3.98	4.05	4.08	3.8	0.4
bottom	0.267	0.24	0.233	0.245	0.2	0.0

Site SQT2 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	237	219	226	196.3	219.6	17.2
2 cm	200	205	178.9	162.4	186.6	19.7
mid	6.65	7.04	5.5	4.79	6.0	1.0
bottom	0.662	0.453	0.484	0.473	0.5	0.1

Site SQT2 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	367	332	329	333	340.3	17.9
2 cm	284	288	280	247	274.8	18.8
mid	79.2	79.4	79.4	71.4	77.4	4.0
bottom	0.125	0.275	0.112	0.116	0.2	0.1

Site SQT2 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	233	256	251	217	239.3	17.8
2 cm	203	199.7	229	199.6	207.8	14.2
mid	4.94	4.61	5.51	4.28	4.8	0.5
bottom	0.05	0.05	0.09	0.14	0.1	0.0

Site SQT2 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	75.1	70.5	70.4	69.1	71.3	2.6
2 cm	61	59.4	59.9	54.5	58.7	2.9
mid	2.06	2.12	2.08	1.88	2.0	0.1
bottom	0.01	0.01	0.023	0.036	0.0	0.0

UVA Sunny (microWatts/cm2)

Site SQT1 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	1120	1188	1336	1303	1236.8	100.4
2 cm	969	1106	1287	1305	1166.8	159.6
mid	192	153.5	219	241	201.4	37.7
bottom	36	27.7	40.9	41.4	36.5	6.4

Site SQT1 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	1344	1543	1938	2400	1806.3	466.5
2 cm	1771	1426	1974	2120	1822.8	300.7
mid	332	392	383	381	372.0	27.1
bottom	72.2	70.8	66.3	56.1	66.4	7.3

Site SQT1 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	3650	3340	3280	3340	3402.5	167.4
2 cm	2870	2690	2960	2660	2795.0	143.9
mid	360	370	230	200	290.0	87.6
bottom	0	0	0	0	0.0	0.0

Site SQT1 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	2020	1883	1807	1801	1877.8	101.9
2 cm	1412	1497	1434	1334	1419.3	67.3
mid	241	205	216	195.4	214.4	19.7
bottom	30	25.8	14.19	30	25.0	7.5

Site SQT1 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	316	256	241	228	260.3	38.9
2 cm	220	203	173	196	198.0	19.5
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

UVB Sunny (microWatts/cm2)

Site SQT1 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	149.8	147.5	151	145.4	148.4	2.5
2 cm	144.5	142.1	131.3	136.3	138.6	5.9
mid	10.16	12.2	9.08	10.69	10.5	1.3
bottom	0.799	0.924	0.733	0.709	0.8	0.1

Site SQT1 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	223	230	233	201	221.8	14.5
2 cm	189.9	178.9	229	162.3	190.0	28.4
mid	7.26	6.55	12.3	9.18	8.8	2.6
bottom	0.56	0.595	0.551	0.601	0.6	0.0

Site SQT1 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	399	389	396	385	392.3	6.4
2 cm	385	335	354	335	352.3	23.6
mid	26.6	30.8	24.4	25	26.7	2.9
bottom	1.323	1.406	1.117	1.176	1.3	0.1

Site SQT1 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	190.8	198.1	199.7	191.4	195.0	4.6
2 cm	137.7	160.1	122.6	161.9	145.6	18.9
mid	8.07	6.99	7.56	7.29	7.5	0.5
bottom	0.279	0.267	0.271	0.248	0.3	0.0

Site SQT1 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	31.9	32	31.9	30.7	31.6	0.6
2 cm	27.9	27.8	25.4	26.1	26.8	1.2
mid	1.448	0.916	1.296	1.027	1.2	0.2
bottom	0	0	0	0	0.0	0.0

Samples Collected 3 August 05 by MT, HM

UVA Cloudy (microWatts/cm2)

Site SQT1 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	804	732	755	710	750.3	40.3
2 cm	378	354	488	502	430.5	75.3
mid	10.8	12.4	9.1	8.7	10.3	1.7
bottom	1	0.9	1.1	0.89	1.0	0.1

Site SQT1 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	1973	1991	1993	2130	2021.8	72.7
2 cm	1102	1369	1883	1507	1465.3	325.3
mid	6.96	6.5	6.5	5.5	6.4	0.6
bottom	2.6	2.2	2.6	2.5	2.5	0.2

Site SQT1 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	828	781	780	727	779.0	41.3
2 cm	455	624	642	500	555.3	91.9
mid	6.8	4.97	5.9	5.8	5.9	0.7
bottom	0.88	1	0.66	0.66	0.8	0.2

Site SQT1 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	2250	2150	2130	2230	2190.0	58.9
2 cm	1513	1865	1983	1491	1713.0	248.5
mid	23.3	32.6	26.6	22	26.1	4.7
bottom	3.1	3.1	2.7	2.7	2.9	0.2

Site SQT1 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	300	275	278	272	281.3	12.7
2 cm	214	147.6	236	232	207.4	41.0
mid	1.3	2.96	3.1	3	2.6	0.9
bottom	0.57	6.4	0.4	0.35	1.9	3.0

UVB Cloudy (microWatts/cm2)

Site SQT1 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	59.2	70.5	75.1	76.2	70.3	7.8
2 cm	24.7	38.1	57.4	76.2	49.1	22.5
mid	0.04	0.04	0.5	0.2	0.2	0.2
bottom	0.48	0.24	0.5	0.6	0.5	0.2

Site SQT1 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	199.3	224	216	231	217.6	13.6
2 cm	81	153.9	80.4	147.7	115.8	40.6
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

Site SQT1 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	90	81.7	82	81.1	83.7	4.2
2 cm	61.9	36.4	58.9	48.1	51.3	11.6
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

Site SQT1 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	298	283	277	251	277.3	19.6
2 cm	180.5	901	928	198	551.9	418.9
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

Site SQT1 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	41.7	37.3	37	34.2	37.6	3.1
2 cm	22.6	23.5	30.9	23.4	25.1	3.9
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

UVA Cloudy (microWatts/cm2)

Site SQT2 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	1144	1147	1172	1194	1164.3	23.5
2 cm	808	753	706	821	772.0	53.0
mid	3.45	3.67	3.5	3.78	3.6	0.2
bottom	0.2	0.18	0.2	0.265	0.2	0.0

Site SQT2 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm						
2 cm						
mid						
bottom						

Site SQT2 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	928	1075	1088	1044	1033.8	72.9
2 cm	621	729	827	717	723.5	84.2
mid	2.5	2.4	2.94	3	2.7	0.3
bottom	0.14	0.16	0.15	0.15	0.2	0.0

Site SQT2 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	1959	1944	1823	1444	1792.5	240.2
2 cm	933	1260	7850	1233	2819.0	3357.3
mid	8.7	5.8	5.7	5.7	6.5	1.5
bottom	0.13	0.19	0	0.1	0.1	0.1

Site SQT2 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	175.1	168.1	165.6	150.5	164.8	10.4
2 cm	11.5	12.6	125.6	75.8	56.4	55.1
mid	0.8	0.4	0.7	0.6	0.6	0.2
bottom	0	0.1	0	0	0.0	0.1

UVB Cloudy (microWatts/cm2)

Site SQT2 Time 08:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	153.4	163.7	158.3	170.5	161.5	7.3
2 cm	92.5	86.5	66.7	37.1	70.7	25.0
mid	0.06	0	0	0.27	0.1	0.1
bottom	0.2	0.6	0	0	0.2	0.3

Site SQT2 Time 10:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	242	241	240	239	240.5	1.3
2 cm	131.7	92.7	11.6	96.9	83.2	50.8
mid	0.15	0	0	0	0.0	0.1
bottom	0	0	0	0	0.0	0.0

Site SQT2 Time 14:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	74	82.4	83.8	87.9	82.0	5.8
2 cm	31.1	41.1	58.3	47.2	44.4	11.4
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

Site SQT2 Time 16:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	178	145.8	141.8	134	149.9	19.4
2 cm	16.9	71.9	84.5	62	58.8	29.4
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0

Site SQT2 Time 18:00

Depth	Reading 1	Reading 2	Reading 3	Reading 4	**AVG**	**STD**
0 cm	9.1	6.8	7	6.9	7.5	1.1
2 cm	3.9	3.4	4	4.3	3.9	0.4
mid	0	0	0	0	0.0	0.0
bottom	0	0	0	0	0.0	0.0