Appendix E

Toxicity Testing Data

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Biomonitoring of Surface Water Samples
New Bedford Harbor
New Bedford, Massachusetts

Fall 2008

Prepared for

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Biomonitoring of Surface Water Samples
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1.0 INTRODUCTION

This report provides a summarization of data generated from a series of acute and chronic exposure screening assays evaluating surface water samples collected from New Bedford Harbor. Toxicity tests were conducted on grab surface water samples collected from the specified areas in the harbor. Assay design included a laboratory control treatment and one or more surface water samples. Samples were evaluated "As Received" without dilutions. Assays were conducted based on water quality levels in the vicinity of dredging operations. Samples were collected by Battelle personnel from the Duxbury, Massachusetts office. Testing was based on programs and protocols developed by the US EPA (2002) and included the following assays; modified 2 day acute and 7 day chronic assays conducted with the mysid shrimp, *Americamysis bahia*, and the red macro alga, *Champia parvula*, and 60 minute chronic fertilization assays conducted with the purple sea urchin, *Arbacia punctulata*. All mysid and urchin fertilization assays and the acute survival portion of the algal assays were conducted by ESI at its Hampton, New Hampshire facility. Additionally, the algal assays were repeated by the Saskatchewan Research Council, SRC, Saskatoon, Saskatchewan, Canada.

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program followed procedures primarily designed by the EPA to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms, and for the analysis of water samples.

2.2 Test Species

A. bahia, ≤5 days, were obtained from cultures maintained by Aquatic Research Organisms (ARO), Hampton, New Hampshire. Juvenile shrimp were collected daily, isolated, and placed in a rearing tank for up to 6 days. Holding tanks were maintained in a flow-through culture mode at a temperature of 25±2°C. At the start of the assays the mysids were 7 days old. Juveniles were fed ≤24 hour old brine shrimp on a daily basis. Water temperature, salinity, and pH were monitored on a daily basis. Prior to testing, organisms were siphoned from the rearing tanks to a holding vessel, and then transferred to test chambers using a large bore pipet, minimizing the amount of water added to test solutions.

A. punctulata adults were from cultures maintained by ESI. Original stock was obtained from commercial supply. Male and female urchins are maintained in separate chambers as recommended by protocol (EPA 2002) and ESI. Adult urchins were induced to spawn by the injection of a potassium chloride solution. The viability of gametes obtained was determined prior to their addition to the test solutions. Eggs and/or sperm that would not result in a fertilized egg were rejected from the pool of gametes used in the assay.

C. parvula biomass was obtained from stock cultures maintained by the Saskatchewan Research Council. Original stocks were obtained from the University of Texas algal collection. The male and female plants are maintained in separate culture vessels under sterile conditions. Algal cultures were maintained on an orbital shaker (100 rpm) at 23±2°C under 16 hour light : 8 hours dark at 40 to 75 foot candles light intensity. Cultures are "cropped" and transferred to fresh nutrient solutions on a weekly basis.

2.3 Surface Water Samples and Laboratory Control Water

Grab surface water samples were collected by Battelle staff on three occasions in the Harbor, Table 1. Samples were placed in polyethylene cubitainers for shipment to the laboratory. Two, 2.5 gallon cubitainers were collected for each of the chronic assays. Prior to testing, samples were evaluated to document salinity, conductivity, and total residual chlorine. Total residual chlorine was measured by amperometric titration (MDL

0.05 mg/L). Prior to use in the assays, the salinity of the samples was adjusted, if necessary, to predetermined levels using artificial sea salts for *A. bahia* and *A. punctulata* assays, and GP-2 salts (EPA 2002) for the *C. parvula* assays. The salinity of samples for the *A. bahia* acute and chronic exposure assays were adjusted to 25±2‰ while samples used for the *A. punctulata* and *C. parvula* assays were adjusted to 30±2‰. Samples with "as received" salinity above these levels were not adjusted.

Laboratory control water used for mysid and sea urchin assays was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981. The laboratory control water used in the algal assay, collected from Rye, New Hampshire, is the same water used in culture maintenance. Prior to use, seawater used in the algal assays was filtered through glass fiber filters and sterilized. Dilution water used in the algal assays conducted by SRC was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted using commercial sea salts.

2.4 Bioassays

2.4.1 *Americamysis bahia* Modified Acute and Chronic Exposure Bioassays

Modified acute and chronic exposure screening assays were conducted in a static renewal test mode with renewals made at 24-hour intervals. The 7 day assays were conducted at a temperature of 26±1°C with a photoperiod of 16:8 hours light:dark. Mysids were maintained in 250 mL beakers containing 150 mL of test solution. Approximately 100 mL of the test solution were replaced each day. The assay incorporated 8 replicates with 5 organisms/replicate. Survival and dissolved oxygen were measured daily in each replicate prior to test solution renewal. Salinity, temperature and pH were recorded in a composite sample of the "old" test solution and in the "new" test solution prior to being added to the test chamber. Incubator temperatures were also recorded on a daily basis.

During the test, mysids were fed ≤24 hour old *Artemia* nauplii. On Day 7 of the assay, surviving mysids were removed from test solutions, rinsed to remove any surface detritus and salts, and transferred to tared foils and dried for 24 hours at 103°C. Foils were weighed to the nearest 0.01 mg. Mean dry weights per individual were obtained by dividing the net dry weight of all surviving organisms by the number of organisms added at the start of the assay.

2.4.2 *Arbacia punctulata* Chronic Exposure Fertilization Assays

Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0×10^7 sperm/mL in the surface water treatments. Actual sperm concentrations are provided on laboratory bench sheets in Appendix A. Sperm solutions were added to 5 mL aliquots of each sample being evaluated and allowed to remain in the test solutions for 60 minutes before the addition of unfertilized eggs. Each treatment incorporated a total of four (4) replicates. After 20 minutes exposure, the assay was terminated by the addition of 0.2 mL of preservative. Aliquots of preserved solution were counted to determine numbers of fertilized and unfertilized eggs. Fertilization was accepted based on the presence or absence of a fertilization membrane around the egg.

2.4.3 *Champia parvula* Modified Acute and Chronic Exposure Assays

The 7 day red algae assay was conducted with a 2 day exposure period to the surface waters and laboratory control treatments. Each treatment used four replicates with five female branches and one male branch per replicate. Temperature was maintained at 23±1°C. The light source was cool white and fluorescent bulbs set on a 16:8 hours light:dark cycle, with a light intensity of 40 to 75 foot candles. Light intensity was checked at the start of each assay. Temperatures were monitored on a daily basis. Test chambers were 200 mL borosilicate glass fleakers. After 2 days exposure, female branch tips were transferred to approximately 100 mL of recovery medium with added nutrients and allowed to recover and mature for 5 days. During transfer, plants were examined to determine the physical condition of the individual branches. Branches showing signs of degeneration were noted and used to establish an acute endpoint. After the recovery period, the number of cystocarps (reproductive bodies) on each female branch were counted.

2.5 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS, Comprehensive Environmental Toxicity Testing System, software. The program computes acute and chronic exposure endpoints based on EPA decision tree guidelines specified in individual test methods. For chronic exposure endpoints statistical significance was accepted at $\propto$ <0.05.

2.6 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species. These results, summarized in Table 7, provide relative health and response data while allowing for comparison with historic data sets.

2.7 Protocol Deviations and Unacceptable Assays

Review of data collected from the three sets of assays conducted during the monitoring period documented no protocol deviations.

3.0 RESULTS SUMMARY

Table 2 provides a summary of test acceptability for the three rounds of assays conducted during this monitoring period. Tables 3-5 provide summaries of survival, growth, development and reproduction endpoints and associated statistical analyses. Table 6 provides a summary of basic water quality data associated with the assays. Support data, including laboratory bench sheets, are provided in Appendix A.

4.0 REFERENCES

APHA. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20th edition. Washington D.C.

US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. Fourth Edition. EPA-821-R-02-012.

US EPA. 2002. *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. Fourth Edition. EPA-821-R-02-013.

Table 1. Summary of Sample Collection Data. New Bedford Harbor Surface Water Monitoring Program. Fall 2008.

Sample ID	Turbidity (NTU)	Lab Code	Collected		Received		Temperature °C
WQ-TOX-001-082108	25-32	17629-001	08/21/07	1420	08/21/07	1640	4
WQ-TOX-002-082108	14-20	17629-002	08/21/07	1502	08/21/07	1640	4
WQ-TOX-003-082108	0.2-0.3	17629-003	08/21/07	1520	08/21/07	1640	4
WQ-TOX-001-100108	57	17699-001	10/01/08	1123	10/01/08	1630	4
WQ-TOX-002-100108	24	17699-002	10/01/08	1150	10/01/08	1630	4
WQ-TOX-003-100108	3.8	17699-003	10/01/08	1215	10/01/08	1630	4

Table 2. Summary of Assay Acceptability. New Bedford Harbor Surface Water Monitoring Program. Fall 2008.

	Americamysis bahia		*Arbacia punctulata*	*Champia parvula*	
Lab Code	Acute Exposure	Chronic Exposure	Chronic Exposure	Acute Exposure	Chronic Exposure
17629-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
17629-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
17629-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
17699-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
17699-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
17699-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable

Table 3. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring August 21, 2008 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2008.

Sample ID	Reps	Mean	Min	Max	CV	Significant Difference vs			
						p Value	Lab	p Value	Ref
Arbacia punctulata			Portion Fertilized						
Lab Control	4	88.7%	87.7%	90.1%	1.12%	-	-	-	-
WQ-TOX-003 Ref		34.1%	19.7%	44.9%	33.21%		YES	-	-
WQ-TOX-002		36.2%	32.5%	41.3%	10.26%		YES		YES
WQ-TOX-001		56.2%	55.1%	58.0%	2.41%		YES		YES
Americamysis bahia									
			Day 2 Survival						
Lab Control	8	97.5%	80.0%	100.0%	7.25%	-	-	-	-
WQ-TOX-003 Ref		87.5%	80.0%	100.0%	11.83%	0.0203	YES	-	-
WQ-TOX-002		100.0%	100.0%	100.0%	0.00%	1.0000	NO	1.0000	NO
WQ-TOX-001		100.0%	100.0%	100.0%	0.00%	1.0000	NO	1.0000	NO
			Day 7 Survival						
Lab Control	8	95.0%	80.0%	100.0%	9.75%	-	-	-	-
WQ-TOX-003 Ref		85.0%	60.0%	100.0%	16.64%	0.0583	NO	-	-
WQ-TOX-002		92.5%	80.0%	100.0%	11.19%	0.4992	NO	0.8752	NO
WQ-TOX-001		87.5%	60.0%	100.0%	20.94%	0.2538	NO	0.7292	NO
			Day 7 Dry Weight Biomass - mg						
Lab Control	8	0.2170	0.1840	0.2420	9.51%	-	-	-	-
WQ-TOX-003 Ref		0.3215	0.2080	0.5980	45.37%	0.9677	NO	-	-
WQ-TOX-002		0.2630	0.1920	0.3640	22.80%	0.9703	NO	0.1559	NO
WQ-TOX-001		0.3012	0.2120	0.3840	18.79%	0.9993	NO	0.3599	NO
Champia parvula									
			Day 2 Survival						
Lab Control	4	100.0%	100.0%	100.0%	0.00%	-	-	-	-
WQ-TOX-003 Ref		100.0%	100.0%	100.0%	0.00%	0.5000	NO	-	-
WQ-TOX-002		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.5000	NO
WQ-TOX-001		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.5000	NO
			Day 7 Mean # Cystocarps						
Lab Control	4	10.53	9.4	11.4	9.74%	-	-	-	-
WQ-TOX-003 Ref		4.90	3.8	6.4	23.68%	0.0006	YES	-	-
WQ-TOX-002		0.10	0.0	0.2	115.50%	0.0016	YES	0.0001	YES
WQ-TOX-001		0.00	0.0	0.0	0.00%	0.0016	YES	0.0001	YES

Table 3. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring October 01, 2008 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2008.

Sample ID	Reps	Mean	Min	Max	CV	Significant Difference vs			
						p Value	Lab	p Value	Ref
Arbacia punctulata			Portion Fertilized						
Lab Control	4	98.8%	97.1%	100.0%	1.24%	-	-	-	-
WQ-TOX-003 Ref		93.3%	91.7%	95.3%	1.64%	0.0010	YES	-	-
WQ-TOX-002		83.9%	80.4%	87.3%	3.93%	0.0000	YES	0.0007	YES
WQ-TOX-001		95.6%	94.4%	97.1%	1.33%	0.0060	YES	0.9659	NO
Americamysis bahia									
			Day 2 Survival						
Lab Control	8	97.5%	80.0%	100.0%	7.25%	-	-	-	-
WQ-TOX-003 Ref		100.0%	100.0%	100.0%	0.00%	0.6395	NO	-	-
WQ-TOX-002		97.5%	80.0%	100.0%	7.25%	0.4796	NO	0.3605	NO
WQ-TOX-001		92.5%	60.0%	100.0%	16.09%	0.3227	NO	0.2209	NO
			Day 7 Survival						
Lab Control	8	97.5%	80.0%	100.0%	7.25%	-	-	-	-
WQ-TOX-003 Ref		97.5%	80.0%	100.0%	7.25%	0.4796	NO	-	-
WQ-TOX-002		97.5%	80.0%	100.0%	7.25%	0.4796	NO	0.4796	NO
WQ-TOX-001		87.5%	40.0%	100.0%	24.24%	0.1911	NO	0.1911	NO
			Day 7 Dry Weight Biomass - mg						
Lab Control	8	No data available - see note 1 below				-	-	-	-
WQ-TOX-003 Ref						-	-	-	-
WQ-TOX-002						-	-	-	-
WQ-TOX-001						-	-	-	-
Champia parvula									
			Day 2 Survival						
Lab Control	4	100.0%	100.0%	100.0%	0.00%	-	-	-	-
WQ-TOX-003 Ref		100.0%	100.0%	100.0%	0.00%	0.5000	NO	-	-
WQ-TOX-002		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.5000	NO
WQ-TOX-001		100.0%	100.0%	100.0%	0.00%	0.5000	NO	0.5000	NO
			Day 7 Mean # Cystocarps						
Lab Control	4	33.10	27.4	39.4	18.10%	-	-	-	-
WQ-TOX-003 Ref		17.10	6.4	24.6	46.87%	0.0186	YES	-	-
WQ-TOX-002		6.15	1.8	8.8	53.35%	0.0001	YES	0.0024	YES
WQ-TOX-001		2.70	1.0	4.6	59.72%	0.0000	YES	0.0062	YES

Note 1. No data available, weight boats with dry organisms dropped by technician prior to obtaining dry weights. Not able to recover dry organisms for weighing.

Table 4. Summary of "As Received" Sample Physical and Chemical Characteristics. New Bedford Harbor Surface Water Monitoring Program. Fall 2008.

Sample ID	Lab Code	Ammonia (mg/L)	pH (SU)	Salinity (‰)	Total Residual Chlorine (mg/L)
WQ-TOX-001-082108	17629-001	<0.1	7.49	29	<0.05
WQ-TOX-002-082108	17629-002	0.22	7.42	29	<0.05
WQ-TOX-003-082108	17629-003	<0.1	7.43	28	<0.05
WQ-TOX-001-100108	17699-001	<0.1	7.58	25	<0.05
WQ-TOX-002-100108	17699-002	<0.1	7.68	25	<0.05
WQ-TOX-003-100108	17699-003	<0.1	7.78	24	<0.05

Table 5. Reference Toxicant Summary. New Bedford Harbor Surface Water Monitoring Program. Fall 2008.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
A. bahia						
08/28/08	Survival	LC-50	20.2	20.9	15.6 - 26.2	SDS (mg/L)
09/10/08	Survival	LC-50	19.1	21.1	15.8 - 26.4	SDS (mg/L)
10/09/08	Survival	LC-50	20.7	20.7	16.1 - 25.3	SDS (mg/L)
07/22/08	Survival	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
07/22/08	Growth	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
10/07/08	Survival	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
10/07/08	Growth	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
A. Punctulata						
08/28/08	Fertilization	C-NOEC	1.0	10.0	5.0 - 20.0	Copper (µg/L)
09/25/08	Fertilization	C-NOEC	1.0	10.0	5.0 - 20.0	Copper (µg/L)
10/16/08	Fertilization	C-NOEC	1.0	10.0	5.0 - 20.0	Copper (µg/L)
08/28/08	Fertilization	IC-25	3.8	29.7	0.0 - 74.8	Copper (µg/L)
09/25/08	Fertilization	IC-25	8.3	28.9	0.0 - 76.2	Copper (µg/L)
10/16/08	Fertilization	IC-25	9.5	26.8	0.0 - 74.9	Copper (µg/L)
Champia parvula						
10/10/08	Reproduction	IC-50	1.05	1.25	1.05 - 1.48	SDS (mg/L)

Mean and Acceptable Ranges based on most recent 20 reference toxicant assays (NELAP standard)

APPENDIX A
SUPPORT DATA

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METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia, Daphnia pulex	EPA-821-R-02-012
Pimephales promelas	EPA-821-R-02-012
Americamysis bahia	EPA-821-R-02-012
Menidia beryllina, Cyprinodon variegatus	EPA-821-R-02-012
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013 1002.0
Pimephales promelas	EPA-821-R-02-013 1000.0
Cyprinodon variegatus	EPA-821-R-02-014 1004.0
Menidia beryllina	EPA-821-R-02-014 1006.0
Arbacia punctulata	EPA-821-R-02-014 1008.0
Champia parvula	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.7/SW 6010 and EPA 200.8/SW 6020
Hardness	Standard Methods 20th Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 20th Edition - Method 4500CLD
Total Organic Carbon	Standard Methods 20th Edition - Method 5310C
Specific Conductance	Standard Methods 20th Edition - Method 2510B
Nitrogen - Ammonia	Standard Methods 20th Edition - Method 4500NH3G
pH	Standard Methods 20th Edition - Method 4500H+B
Solids, Total (TS)	Standard Methods 20th Edition - Method 2540 B
Solids, Total Suspended (TSS)	Standard Methods 20th Edition - Method 2540 D
Solids, Total Dissolved (TDS)	Standard Methods 20th Edition - Method 2540 C
Dissolved Oxygen	Standard Methods 20th Edition - Method 4500-O G

Americamysis bahia 7 DAY CHRONIC ASSAY
SURVIVAL & OLD WATER QUALITIES

STUDY: 17629	CLIENT: Battelle	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY	ORGANISM BATCH/LOT#

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Lab Control	A	5	5	5	5	5	~~4~~ 5	5	5	5.7	5.9	5.5	5.0	6.1	5.4	5.7
	B	5	5	5	5	5	5	5	5	5.7	6.1	5.5	4.8	6.1	5.2	5.5
	C	5	5	5	5	5	5	5	4	5.2	6.3	5.5	4.9	6.0	5.3	5.4
	D	5	5	5	5	5	5	5	5	5.1	6.3	5.5	5.0	5.9	5.4	5.4
	E	5	5	5	5	5	5	5	5	4.6	6.2	5.5	5.2	5.9	5.5	5.4
	F	5	5	5	5	5	5	5	5	4.7	6.0	5.4	5.1	5.7	5.5	5.4
	G	5	5	5	5	5	5	5	5	4.6	6.1	5.2	5.2	5.7	5.5	5.3
	H	5	4	4	4	4	4	4	4	4.6	6.1	5.1	5.4	5.8	5.6	5.4
-001	A	5	5	5	5	5	5	5	5	4.4	6.0	5.1	4.5	6.1	5.7	5.5
	B	5	5	5	4	4	4	3	3	4.4	5.9	5.2	4.9	5.8	5.5	5.3
	C	5	5	5	5	5	5	5	5	4.4	5.9	5.2	4.9	5.8	5.5	5.2
	D	5	5	5	5	5	5	4	4	4.5	6.0	5.2	5.0	5.7	5.5	5.2
	E	5	5	5	4	4	3	3	3	4.4	5.6	5.2	4.8	5.9	5.7	5.3
	F	5	5	5	5	5	5	5	5	4.4	5.8	5.3	5.0	5.8	5.5	5.1
	G	5	5	5	5	5	5	5	5	4.5	5.8	5.2	5.0	5.7	5.3	5.1
	H	5	5	5	5	5	5	5	5	4.4	5.8	5.3	5.2	5.8	5.5	5.1
-002	A	5	5	5	5	5	5	5	5	4.9	6.0	5.5	5.5	6.0	5.7	5.0
	B	5	5	5	5	5	5	5	5	4.8	6.0	5.3	5.3	6.0	5.6	5.3
	C	5	5	5	5	5	5	5	5	4.5	5.8	5.2	4.8	5.9	5.6	5.3
	D	5	5	5	5	5	5	5	4	4.6	5.8	5.1	5.1	5.8	5.6	5.2
	E	5	5	5	5	5	5	5	5	4.9	6.0	5.2	4.3	5.7	5.7	5.4
	F	5	5	5	5	5	5	5	5	4.8	6.1	5.1	4.4	5.5	5.6	5.4
	G	5	5	5	5	5	5	5	4	4.6	6.2	5.0	4.7	5.5	5.6	5.1
	H	5	5	5	4	4	4	4	4	5.0	6.1	5.1	5.1	5.5	5.6	5.2
INC TEMP:		25	25	25	25	25	25	25	25							
DATE:		8/22/08	8/23	8/24	8/25	8/26	8/27	8/28	8/29							
TIME:		1305	1530	1055	1550	0930	1215	1200	1555							
INITIALS:		SJ	DM	LB	SJ	APL	SJ	APL	LB							

Americamysis bahia 7 DAY CHRONIC ASSAY
SURVIVAL & OLD WATER QUALITIES

STUDY:	CLIENT:	LOCATION:	LAB CONTROL:	ORGANISM BATCH/LOT#
4629	Battelle	NEW BEDFORD	HAMPTON ESTUARY	

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
-003	A	5	5	4	4	4	4	~~4~~ 3	~~4~~ 3	5.8	6.1	5.1	4.4	5.6	5.7	5.3
	B	5	5	5	5	5	5	5	5	5.8	6.0	5.0	4.3	5.6	5.7	5.2
	C	5	4	4	4	4	4	4	4	4.6	6.0	5.0	4.3	5.8	5.8	5.2
	D	5	5	4	4	4	4	4	4	4.6	6.1	4.9	4.6	5.7	5.9	4.9
	E	5	5	4	4	4	4	4	4	5.6	6.1	5.1	5.0	5.8	5.9	5.1
	F	5	5	4	4	4	4	4	4	4.9	6.0	5.2	5.1	5.7	6.0	5.3
	G	5	5	5	5	5	5	5	5	4.9	5.9	5.1	4.1	5.6	5.8	5.3
	H	5	5	5	5	5	5	5	5	5.1	5.8	4.8	4.4	5.5	5.9	5.2
	A															
	B															
	C															
	D															
	E															
	F															
	G															
	H															
INC TEMP:		25	25	25	25	25	25	25	25							
DATE:		8/22/08	8/23	8/24	8-25	8-26	8/27	8-28	8/29							
TIME:		1305	1530	1055	0930	0930	1215	1200	1555							
INITIALS:		SJ	DM	UB	APL	APL	SJ	APL	UB							

CETIS Summary Report

Link/Link Code: 12-8828-8740

Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
17629-000	01-6030-3695	22 Aug-08 14:00	22 Aug-08 14:00	N/A	Battelle Labs	Ecological Risk Assessme
17629-003	05-4158-6637	21 Aug-08 15:20	21 Aug-08 18:40	22h		
17629-002	08-5309-8454	21 Aug-08 15:02	21 Aug-08 18:40	22h		
17629-001	09-2317-4687	21 Aug-08 14:20	21 Aug-08 18:40	23h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
17629-000	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	Laboratory Water Control		
17629-003	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-003		
17629-002	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-002		
17629-001	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-001		

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
01-1164-5507	7d Proportion Survived	Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria
12-8117-9100	7d Proportion Survived	Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria
20-9815-6064	7d Proportion Survived	Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria
06-0667-4011	Mean Dry Biomass-mg	Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
12-1684-2765	Mean Dry Biomass-mg	Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
12-3514-5195	Mean Dry Biomass-mg	Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
01-0309-5887	Mean Dry Biomass-mg	PMSD	0.3055	0.11 - 0.37	Yes	Passes acceptability criteria
01-1989-7363	Mean Dry Biomass-mg	PMSD	0.3031	0.11 - 0.37	Yes	Passes acceptability criteria
06-0667-4011	Mean Dry Biomass-mg	PMSD	0.182	0.11 - 0.37	Yes	Passes acceptability criteria
12-1684-2765	Mean Dry Biomass-mg	PMSD	0.1729	0.11 - 0.37	Yes	Passes acceptability criteria
12-3514-5195	Mean Dry Biomass-mg	PMSD	0.4228	0.11 - 0.37	Yes	Fails acceptability criteria

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9486	1	0.8	1	0.01291	0.07071	7.25%	0.0%
17629-003	8	0.875	0.8363	0.9137	0.8	1	0.0189	0.1035	11.83%	10.26%
17629-002	8	1	1	1	1	1	0	0	0.0%	-2.56%
17629-001	8	1	1	1	1	1	0	0	0.0%	-2.56%

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9154	0.9846	0.8	1	0.0169	0.09258	9.75%	0.0%
17629-003	8	0.85	0.7972	0.9028	0.6	1	0.02582	0.1414	16.64%	10.53%
17629-002	8	0.925	0.8863	0.9637	0.8	1	0.0189	0.1035	11.19%	2.63%
17629-001	8	0.875	0.8066	0.9434	0.6	1	0.03345	0.1832	20.94%	7.9%

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2093	0.2247	0.184	0.242	0.003769	0.02065	9.51%	0.0%
17629-003	8	0.3215	0.267	0.376	0.208	0.598	0.02663	0.1459	45.37%	-48.16%
17629-002	8	0.263	0.2406	0.2854	0.192	0.364	0.01095	0.05997	22.8%	-21.2%
17629-001	8	0.3012	0.2801	0.3224	0.212	0.384	0.01033	0.0566	18.79%	-38.82%

Americamysis 7-d Survival, Growth and Fecundity Test **EnviroSystems, Inc.**

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2194	0.2404	0.194	0.2875	0.00513	0.0281	12.22%	0.0%
17629-003	8	0.3744	0.3232	0.4257	0.212	0.598	0.02507	0.1373	36.67%	-62.84%
17629-002	8	0.2844	0.2637	0.3051	0.21	0.364	0.01013	0.05548	19.51%	-23.68%
17629-001	8	0.3524	0.3262	0.3786	0.254	0.4525	0.01279	0.07008	19.89%	-53.26%

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	1	0.8
17629-003	0.8	1	0.8	0.8	0.8	0.8	1	1
17629-002	1	1	1	1	1	1	1	1
17629-001	1	1	1	1	1	1	1	1

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	0.8	1	1	1	1	0.8
17629-003	0.6	1	0.8	0.8	0.8	0.8	1	1
17629-002	1	1	1	0.8	1	1	0.8	0.8
17629-001	1	0.6	1	0.8	0.6	1	1	1

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.224	0.194	0.23	0.216	0.242	0.238	0.208	0.184
17629-003	0.21	0.212	0.268	0.208	0.222	0.436	0.598	0.418
17629-002	0.238	0.364	0.288	0.192	0.21	0.32	0.214	0.278
17629-001	0.318	0.266	0.254	0.362	0.212	0.384	0.314	0.3

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.224	0.194	0.2875	0.216	0.242	0.238	0.208	0.23
17629-003	0.35	0.212	0.335	0.26	0.2775	0.545	0.598	0.418
17629-002	0.238	0.364	0.288	0.24	0.21	0.32	0.2675	0.3475
17629-001	0.318	0.4433	0.254	0.4525	0.3533	0.384	0.314	0.3

CETIS Analytical Report

Link/Link Code: 12-8828-8740

Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	03-0969-9106	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:16	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					25.64%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-001	0.4044	1.761	0.096	0.3460	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0019435	0.0019435	1	0.1635	0.6920	Non-Significant Effect
Error	0.1663766	0.0118840	14			
Total	0.1683201	0.0138275	15			

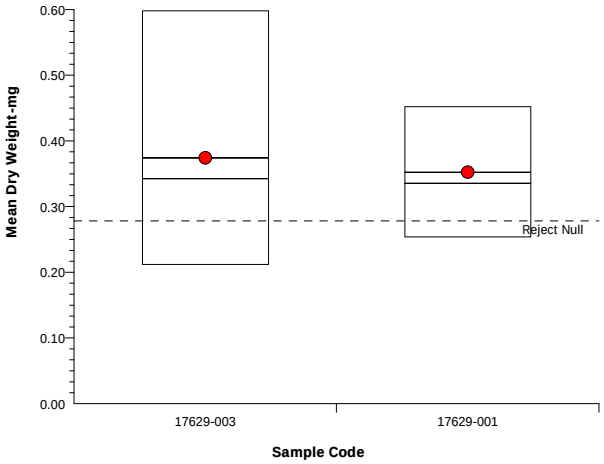
ANOVA Assumptions

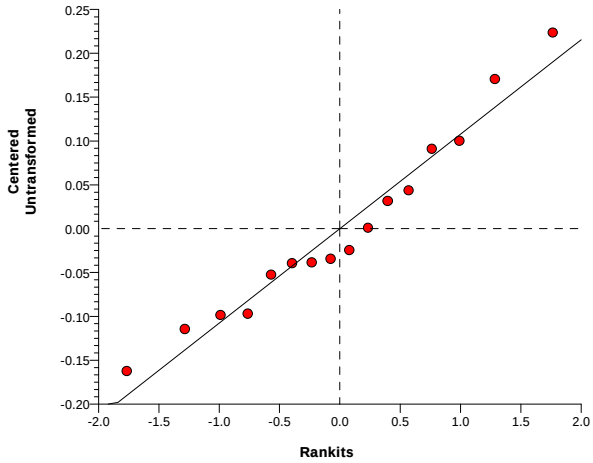
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.84	8.885	0.0967	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9567		0.6031	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3744	0.3222	0.4267	0.212	0.598	0.0255	0.1373	36.67%	0.0%
17629-001	8	0.3524	0.3257	0.3791	0.254	0.4525	0.01301	0.07008	19.89%	5.89%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	05-9215-7737	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:16	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					24.63%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	1.72	1.761	0.09223	0.0537	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.032445	0.032445	1	2.958	0.1075	Non-Significant Effect
Error	0.1535449	0.0109675	14			
Total	0.1859899	0.0434125	15			

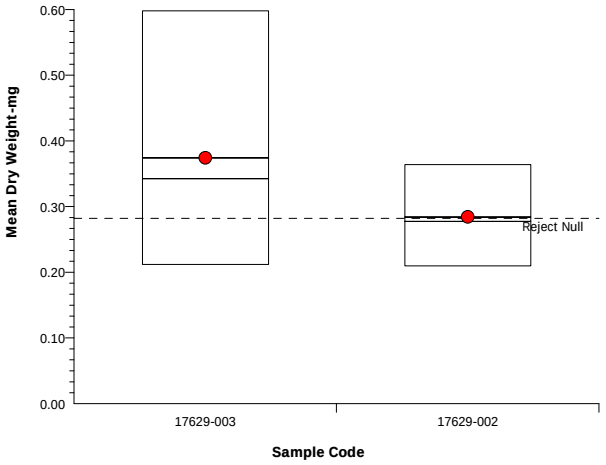
ANOVA Assumptions

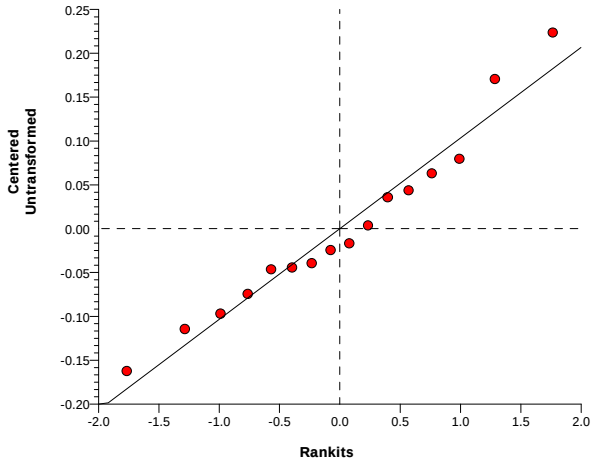
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.127	8.885	0.0289	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9598		0.6584	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3744	0.3222	0.4267	0.212	0.598	0.0255	0.1373	36.67%	0.0%
17629-002	8	0.2844	0.2633	0.3055	0.21	0.364	0.0103	0.05548	19.51%	24.05%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	15-7062-5725	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					20.45%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-001	-4.588	1.761	0.04701	0.9998	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.059984	0.059984	1	21.05	0.0004	Significant Effect
Error	0.0399006	0.0028500	14			
Total	0.0998846	0.0628340	15			

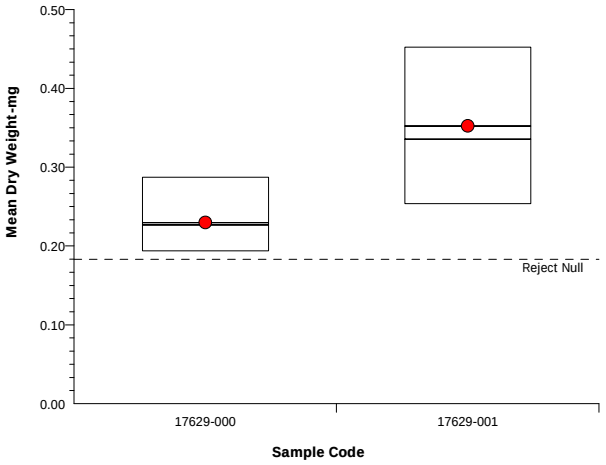
ANOVA Assumptions

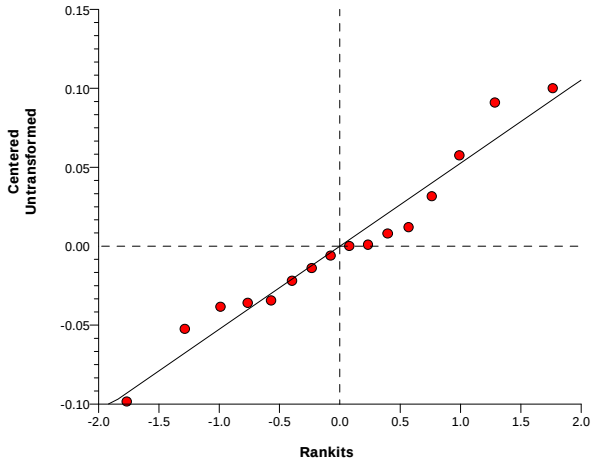
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.22	8.885	0.0277	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9584		0.6332	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2192	0.2406	0.194	0.2875	0.005217	0.0281	12.22%	0.0%
17629-001	8	0.3524	0.3257	0.3791	0.254	0.4525	0.01301	0.07008	19.89%	-53.26%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	08-6048-2432	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					16.84%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-002	-2.476	1.761	0.03872	0.9867	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0118541	0.0118541	1	6.131	0.0267	Significant Effect
Error	0.0270689	0.0019335	14			
Total	0.038923	0.0137876	15			

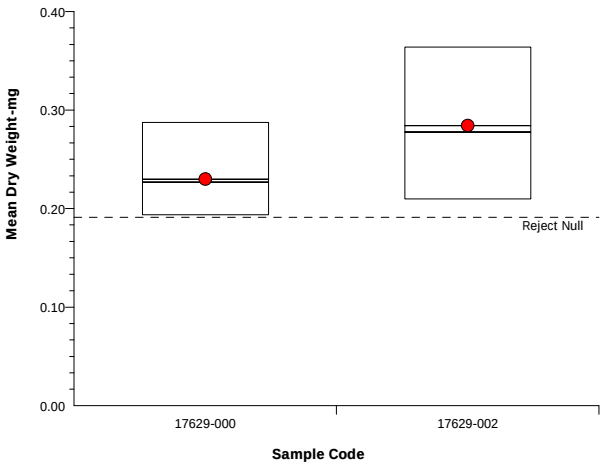
ANOVA Assumptions

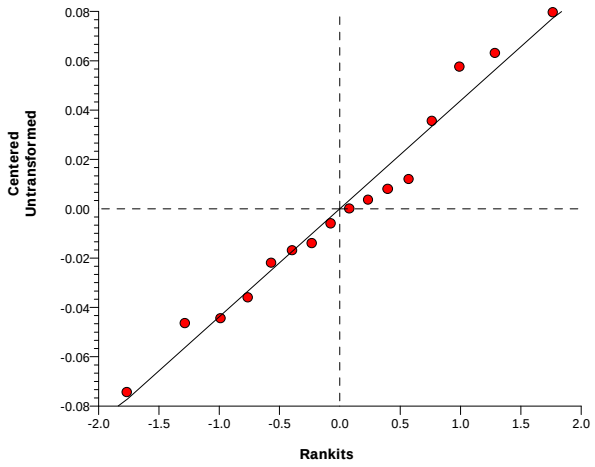
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.898	8.885	0.0933	Equal Variances
Distribution	Shapiro-Wilk Normality	0.97		0.8379	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2192	0.2406	0.194	0.2875	0.005217	0.0281	12.22%	0.0%
17629-002	8	0.2844	0.2633	0.3055	0.21	0.364	0.0103	0.05548	19.51%	-23.68%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	20-6063-8926	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					37.96%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	-2.916	1.761	0.08728	0.9944	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0835218	0.0835218	1	8.502	0.0113	Significant Effect
Error	0.1375281	0.0098234	14			
Total	0.2210499	0.0933452	15			

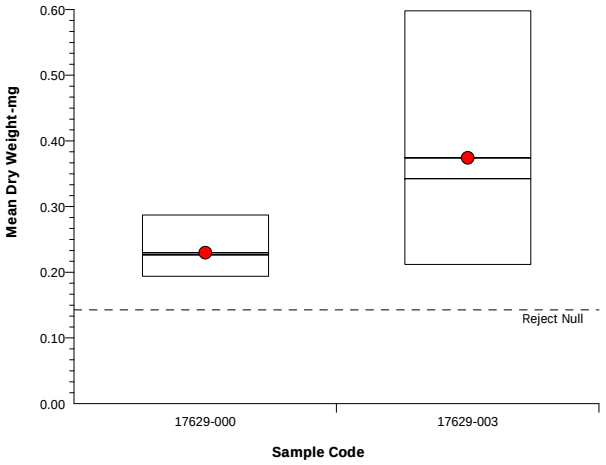
ANOVA Assumptions

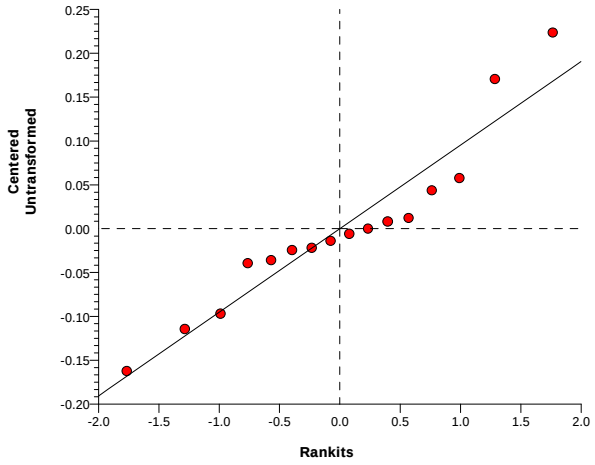
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	23.89	8.885	0.0004	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9199		0.1679	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2192	0.2406	0.194	0.2875	0.005217	0.0281	12.22%	0.0%
17629-003	8	0.3744	0.3222	0.4267	0.212	0.598	0.0255	0.1373	36.67%	-62.84%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	01-1989-7363	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					30.31%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-001	0.3661	1.761	0.09743	0.3599	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
PMSD	0.3031	0.11 - 0.37	Yes	Passes acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0016404	0.0016404	1	0.134	0.7198	Non-Significant Effect
Error	0.1713662	0.0122404	14			
Total	0.1730065	0.0138808	15			

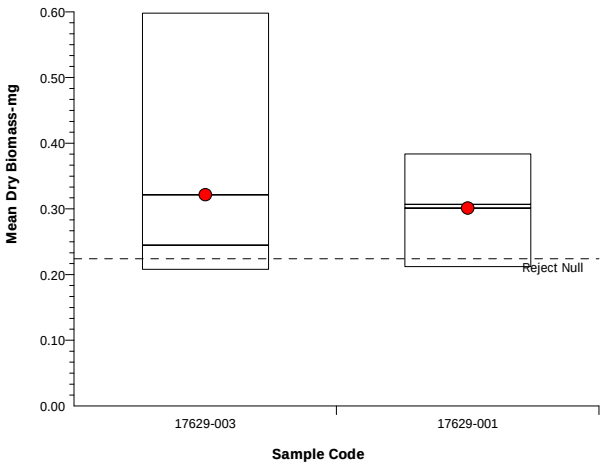
ANOVA Assumptions

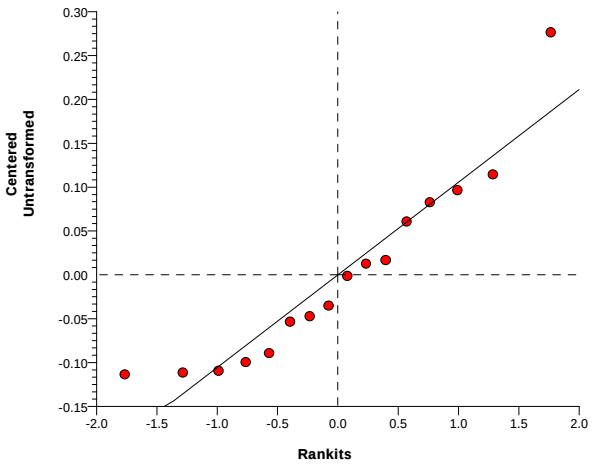
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.642	8.885	0.0231	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8958		0.0688	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3215	0.266	0.377	0.208	0.598	0.02709	0.1459	45.37%	0.0%
17629-001	8	0.3012	0.2797	0.3228	0.212	0.384	0.01051	0.0566	18.79%	6.3%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	01-0309-5887	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					30.55%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	1.049	1.761	0.09821	0.1559	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
PMSD	0.3055	0.11 - 0.37	Yes	Passes acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.013689	0.013689	1	1.101	0.3119	Non-Significant Effect
Error	0.1741183	0.0124370	14			
Total	0.1878072	0.026126	15			

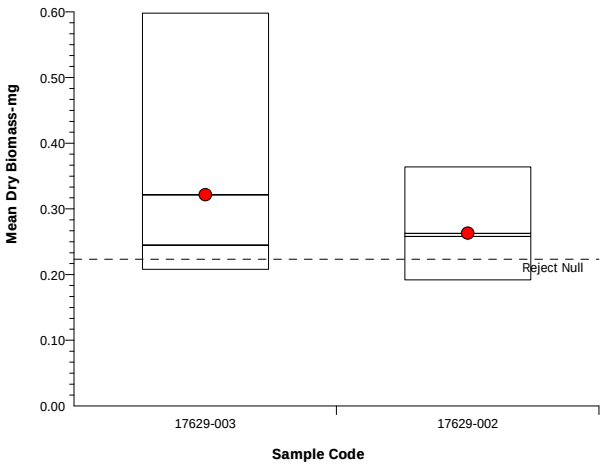
ANOVA Assumptions

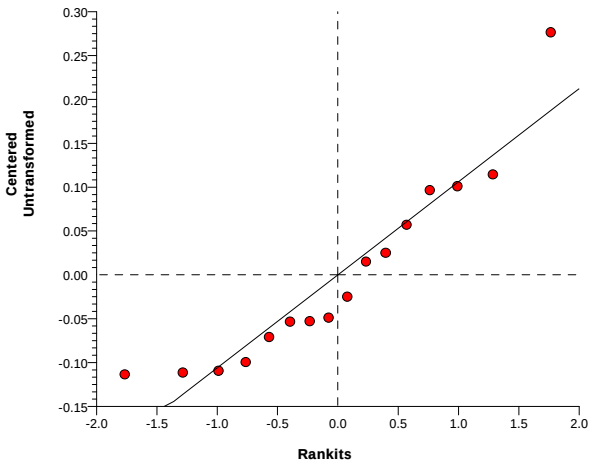
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.916	8.885	0.0318	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8894		0.0545	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3215	0.266	0.377	0.208	0.598	0.02709	0.1459	45.37%	0.0%
17629-002	8	0.263	0.2402	0.2858	0.192	0.364	0.01114	0.05997	22.8%	18.2%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	12-1684-2765	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					17.29%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-001	-3.955	1.761	0.03752	0.9993	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
PMSD	0.1729	0.11 - 0.37	Yes	Passes acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0283922	0.0283922	1	15.64	0.0014	Significant Effect
Error	0.0254070	0.0018148	14			
Total	0.0537992	0.030207	15			

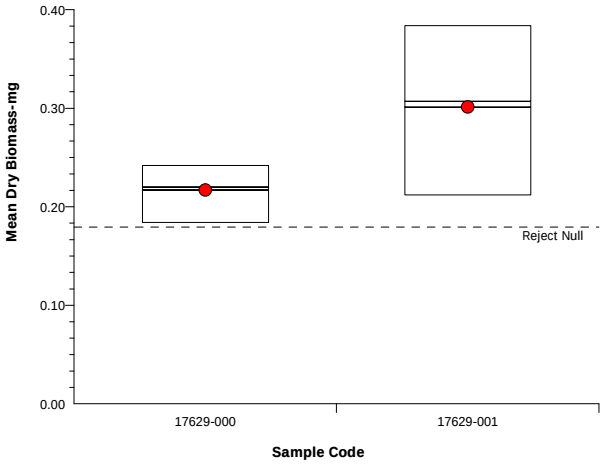
ANOVA Assumptions

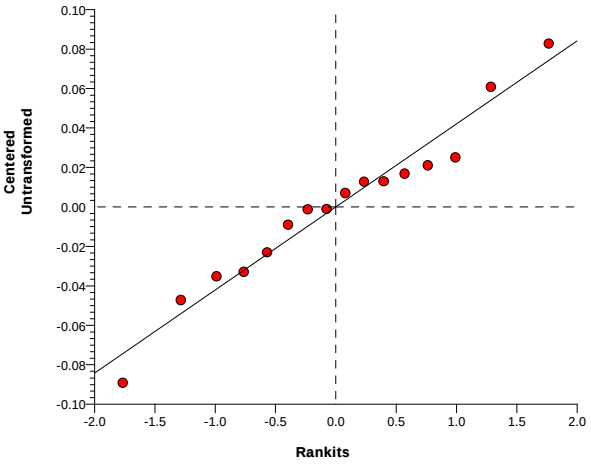
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.515	8.885	0.0163	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9717		0.8646	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2091	0.2249	0.184	0.242	0.003834	0.02065	9.51%	0.0%
17629-001	8	0.3012	0.2797	0.3228	0.212	0.384	0.01051	0.0566	18.79%	-38.82%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	06-0667-4011	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					18.2%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-002	-2.051	1.761	0.0395	0.9703	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
PMSD	0.182	0.11 - 0.37	Yes	Passes acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0084642	0.0084642	1	4.208	0.0594	Non-Significant Effect
Error	0.0281591	0.0020114	14			
Total	0.0366234	0.0104756	15			

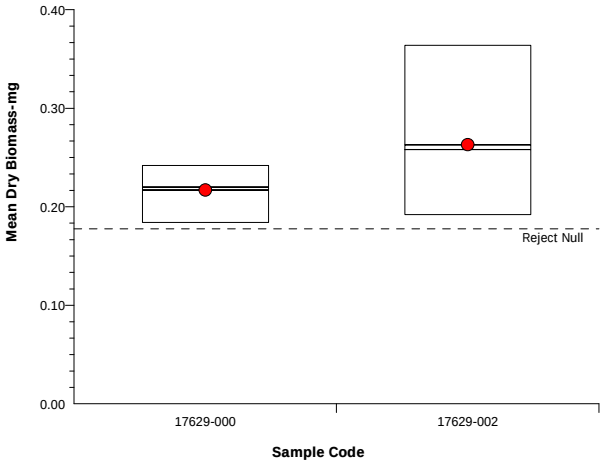
ANOVA Assumptions

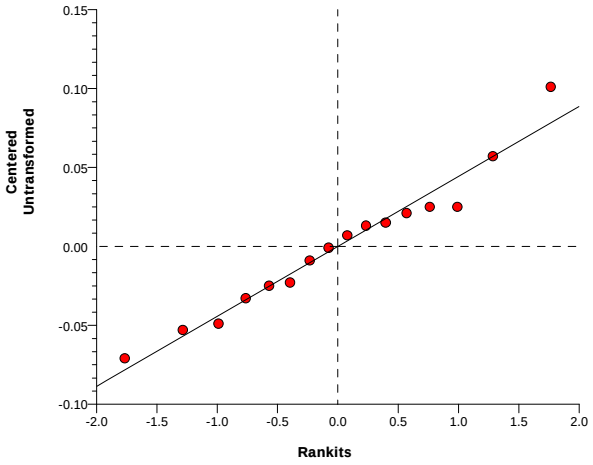
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.438	8.885	0.0116	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9669		0.7855	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2091	0.2249	0.184	0.242	0.003834	0.02065	9.51%	0.0%
17629-002	8	0.263	0.2402	0.2858	0.192	0.364	0.01114	0.05997	22.8%	-21.2%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	12-3514-5195	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					42.28%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	-2.006	1.761	0.09174	0.9677	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
PMSD	0.4228	0.11 - 0.37	Yes	Fails acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0436815	0.0436815	1	4.025	0.0645	Non-Significant Effect
Error	0.1519266	0.0108519	14			
Total	0.1956081	0.0545334	15			

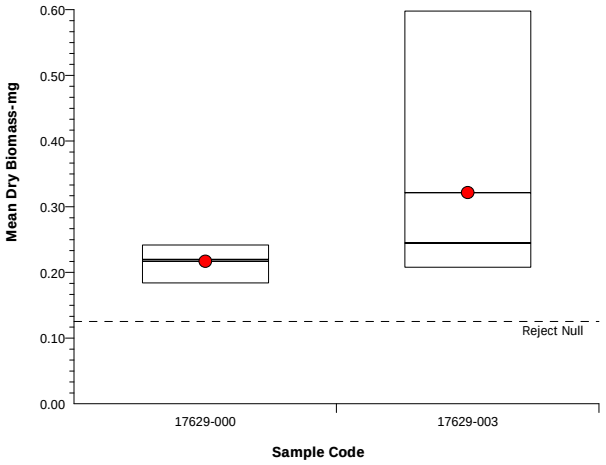
ANOVA Assumptions

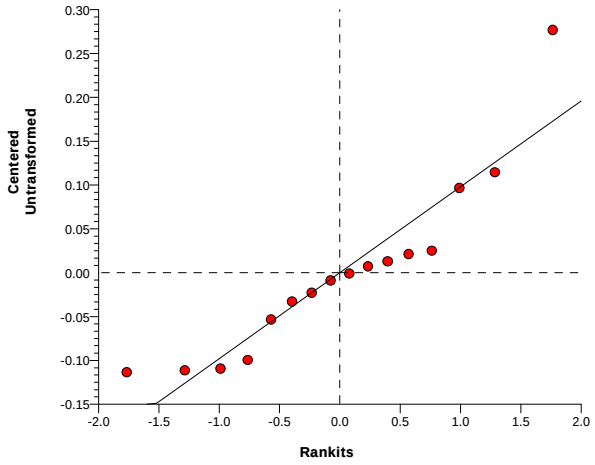
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	49.92	8.885	0.0000	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8766		0.0343	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2091	0.2249	0.184	0.242	0.003834	0.02065	9.51%	0.0%
17629-003	8	0.3215	0.266	0.377	0.208	0.598	0.02709	0.1459	45.37%	-48.16%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	14-9000-0868	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					16.44%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-003		17629-001	72.5		3	0.7292	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0040703	0.0040703	1	0.114	0.7406	Non-Significant Effect
Error	0.4998225	0.0357016	14			
Total	0.5038928	0.0397719	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.651	8.885	0.5244	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8161		0.0045	Non-normal Distribution

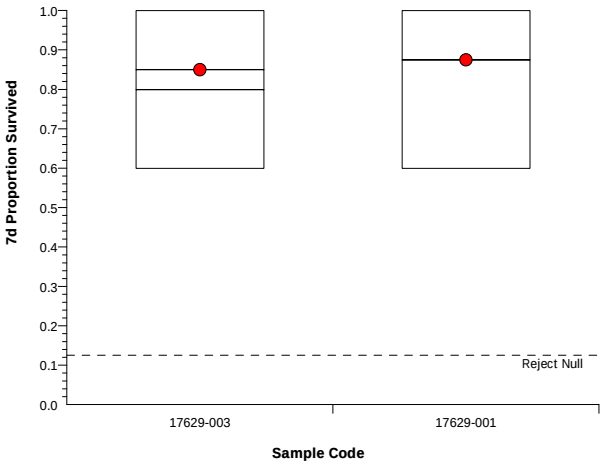
7d Proportion Survived Summary

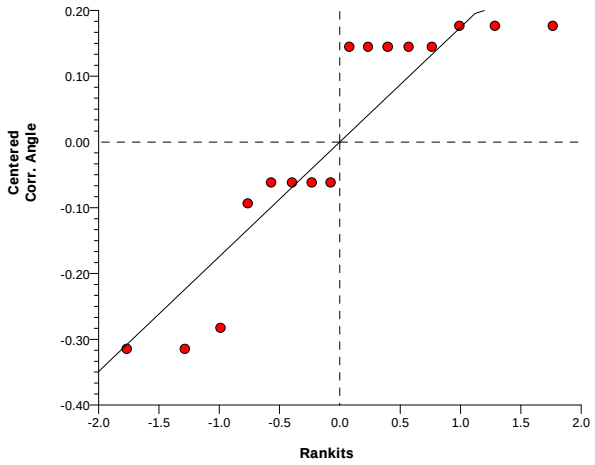
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.85	0.7962	0.9038	0.6	1	0.02626	0.1414	16.64%	0.0%
17629-001	8	0.875	0.8053	0.9447	0.6	1	0.03402	0.1832	20.94%	-2.94%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.169	1.106	1.231	0.8861	1.345	0.03048	0.1641	14.04%	0.0%
17629-001	8	1.201	1.121	1.281	0.8861	1.345	0.03916	0.2109	17.56%	-2.73%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	18-1670-2733	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					12.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	-1.201	1.761	0.1278	0.8752	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0303927	0.0303927	1	1.443	0.2496	Non-Significant Effect
Error	0.2949017	0.0210644	14			
Total	0.3252944	0.0514571	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.774	8.885	0.4674	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9039		0.0929	Normal Distribution

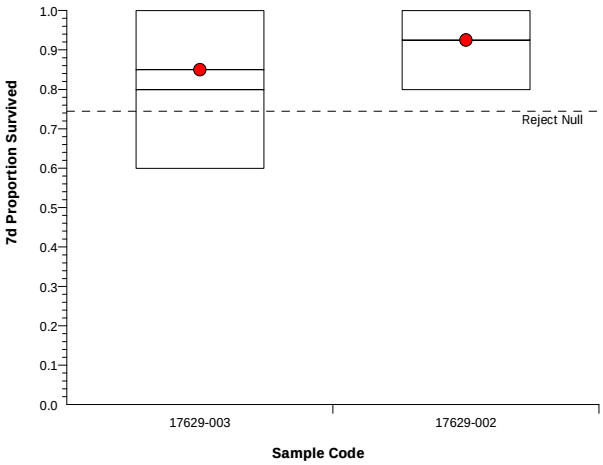
7d Proportion Survived Summary

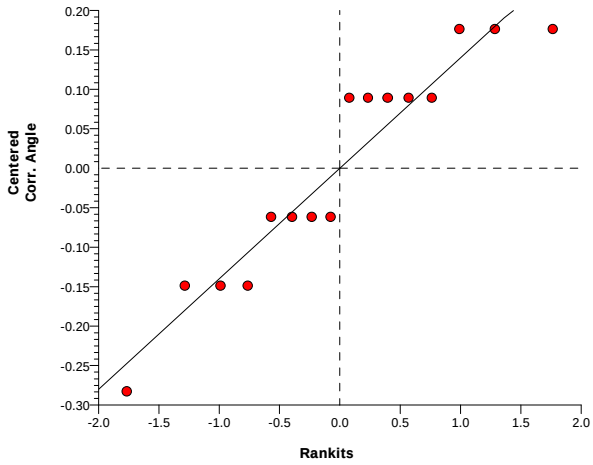
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.85	0.7962	0.9038	0.6	1	0.02626	0.1414	16.64%	0.0%
17629-002	8	0.925	0.8856	0.9644	0.8	1	0.01922	0.1035	11.19%	-8.82%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.169	1.106	1.231	0.8861	1.345	0.03048	0.1641	14.04%	0.0%
17629-002	8	1.256	1.209	1.303	1.107	1.345	0.02289	0.1232	9.81%	-7.46%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	20-9815-6064	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					13.29%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-001	62		2	0.2538	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0289236	0.0289236	1	1.022	0.3293	Non-Significant Effect
Error	0.3963099	0.0283079	14			
Total	0.4252335	0.0572314	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.659	8.885	0.1085	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7966		0.0025	Non-normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9148	0.9852	0.8	1	0.01719	0.09258	9.75%	0.0%
17629-001	8	0.875	0.8053	0.9447	0.6	1	0.03402	0.1832	20.94%	7.9%

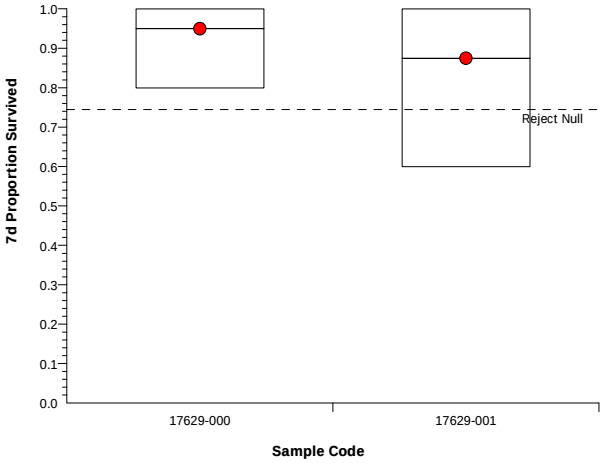
Angular (Corrected) Transformed Summary

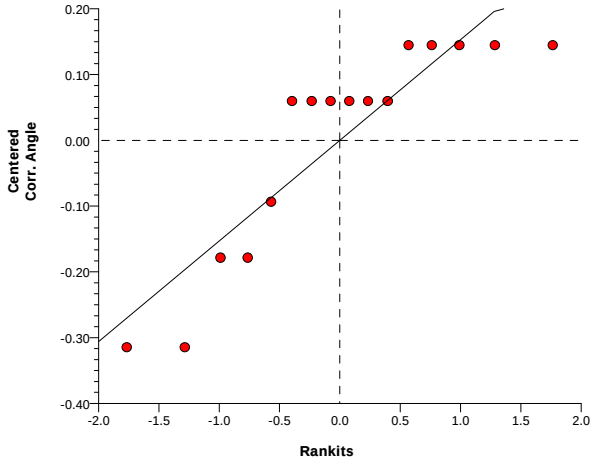
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.286	1.244	1.328	1.107	1.345	0.02047	0.1102	8.57%	0.0%
17629-001	8	1.201	1.121	1.281	0.8861	1.345	0.03916	0.2109	17.56%	6.61%

Americamysis 7-d Survival, Growth and Fecundity Test **EnviroSystems, Inc.**

Analysis No:	20-9815-6064	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	01-1164-5507	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					9.8%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-002	64		2	0.4992	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	0.2593	0.6186	Non-Significant Effect
Error	0.1913892	0.0136707	14			
Total	0.1949334	0.0172149	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.25	8.885	0.7760	Equal Variances
Distribution	Shapiro-Wilk Normality	0.6932		0.0001	Non-normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9148	0.9852	0.8	1	0.01719	0.09258	9.75%	0.0%
17629-002	8	0.925	0.8856	0.9644	0.8	1	0.01922	0.1035	11.19%	2.63%

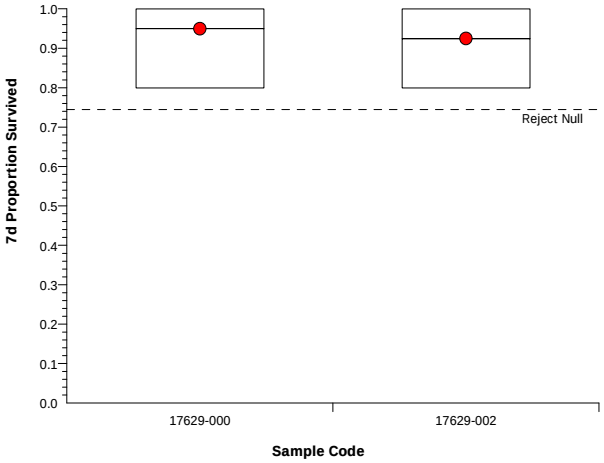
Angular (Corrected) Transformed Summary

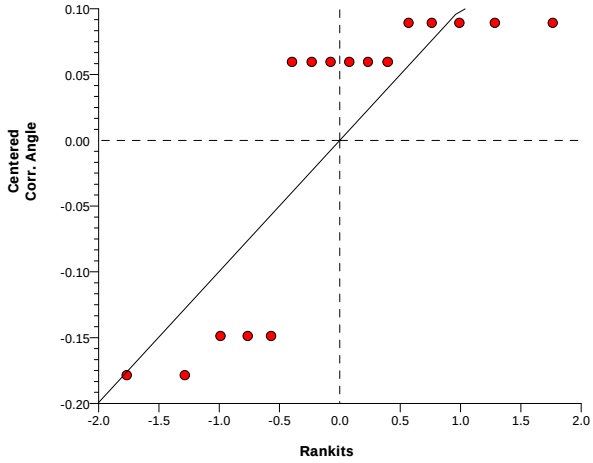
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.286	1.244	1.328	1.107	1.345	0.02047	0.1102	8.57%	0.0%
17629-002	8	1.256	1.209	1.303	1.107	1.345	0.02289	0.1232	9.81%	2.32%

Americamysis 7-d Survival, Growth and Fecundity Test **EnviroSystems, Inc.**

Analysis No:	01-1164-5507	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	12-8117-9100	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					11.32%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	1.673	1.761	0.1231	0.0583	Non-Significant Effect

Test Acceptability

Attribute	Test Stat	Acceptability Limits	Overlap	Decision
Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0546945	0.0546945	1	2.798	0.1166	Non-Significant Effect
Error	0.2736363	0.0195455	14			
Total	0.3283308	0.07424	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.217	8.885	0.3154	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9095		0.1144	Normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9148	0.9852	0.8	1	0.01719	0.09258	9.75%	0.0%
17629-003	8	0.85	0.7962	0.9038	0.6	1	0.02626	0.1414	16.64%	10.53%

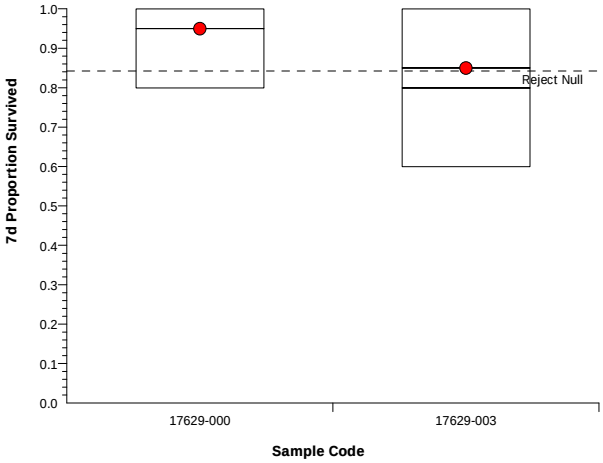
Angular (Corrected) Transformed Summary

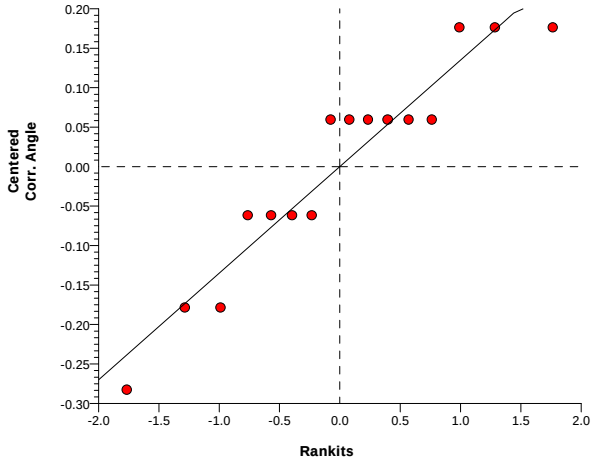
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.286	1.244	1.328	1.107	1.345	0.02047	0.1102	8.57%	0.0%
17629-003	8	1.169	1.106	1.231	0.8861	1.345	0.03048	0.1641	14.04%	9.09%

Americamysis 7-d Survival, Growth and Fecundity Test **EnviroSystems, Inc.**

Analysis No:	12-8117-9100	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	00-2491-7286	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					7.43%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-003		17629-001	88		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0886061	0.0886061	1	11.67	0.0042	Significant Effect
Error	0.1063273	0.0075948	14			
Total	0.1949334	0.0962009	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	4.2	8.862	0.0597	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7854		0.0018	Non-normal Distribution

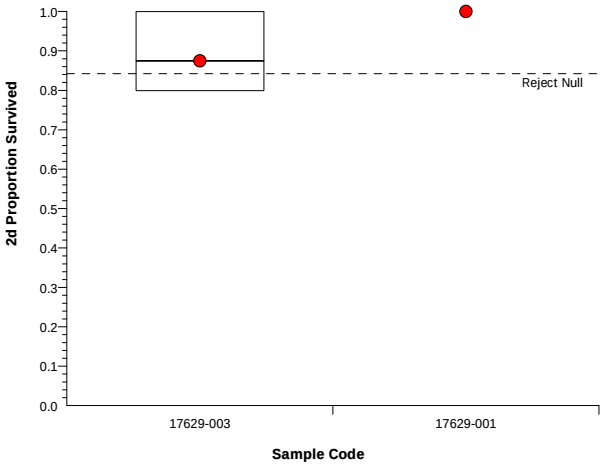
2d Proportion Survived Summary

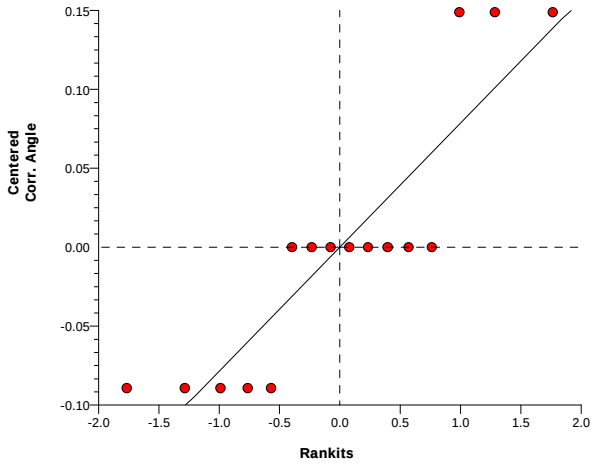
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.875	0.8356	0.9144	0.8	1	0.01922	0.1035	11.83%	0.0%
17629-001	8	1	1	1	1	1	0	0	0.0%	-14.29%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.196	1.15	1.243	1.107	1.345	0.02289	0.1232	10.3%	0.0%
17629-001	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-12.44%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	02-1154-2686	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					7.43%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-003		17629-002	88		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0886061	0.0886061	1	11.67	0.0042	Significant Effect
Error	0.1063273	0.0075948	14			
Total	0.1949334	0.0962009	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	4.2	8.862	0.0597	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7854		0.0018	Non-normal Distribution

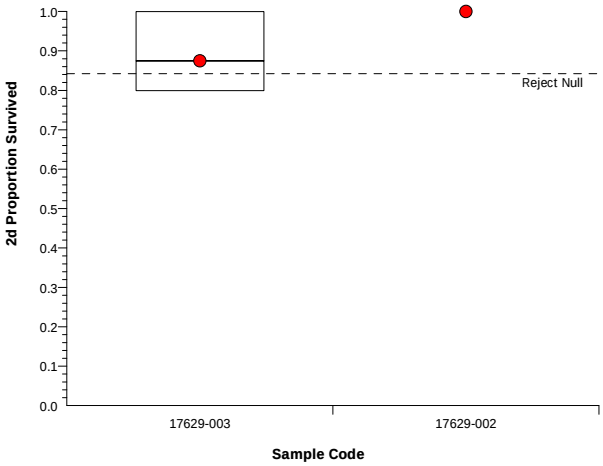
2d Proportion Survived Summary

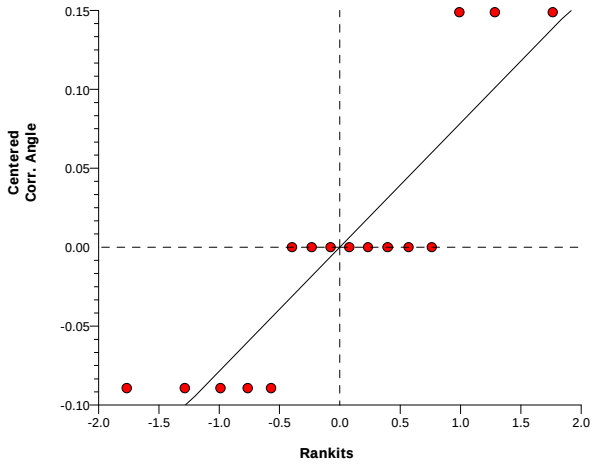
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.875	0.8356	0.9144	0.8	1	0.01922	0.1035	11.83%	0.0%
17629-002	8	1	1	1	1	1	0	0	0.0%	-14.29%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.196	1.15	1.243	1.107	1.345	0.02289	0.1232	10.3%	0.0%
17629-002	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-12.44%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	09-5397-8859	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					6.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-001	72		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

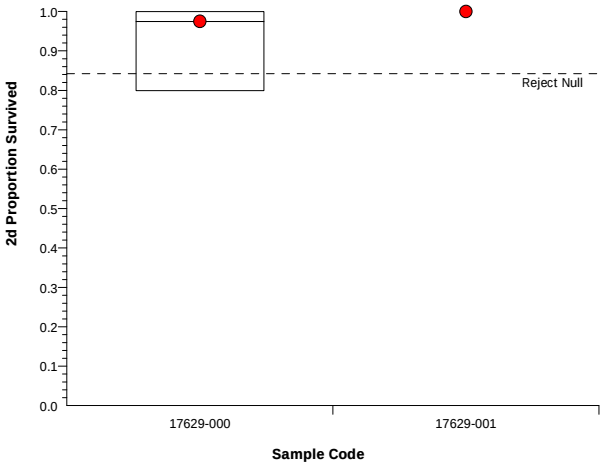
2d Proportion Survived Summary

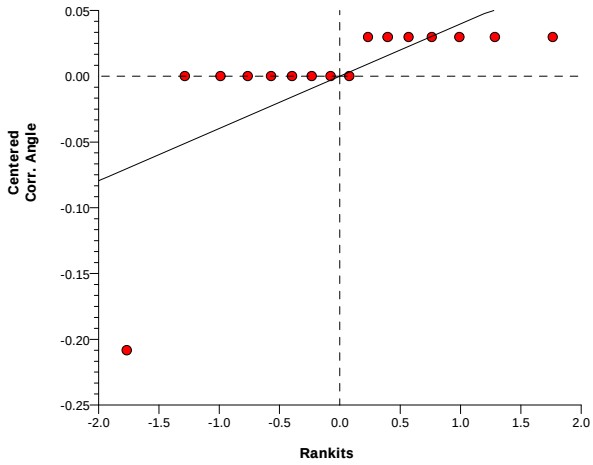
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
17629-001	8	1	1	1	1	1	0	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
17629-001	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-2.26%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	18-2611-3572	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					6.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-002	72		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

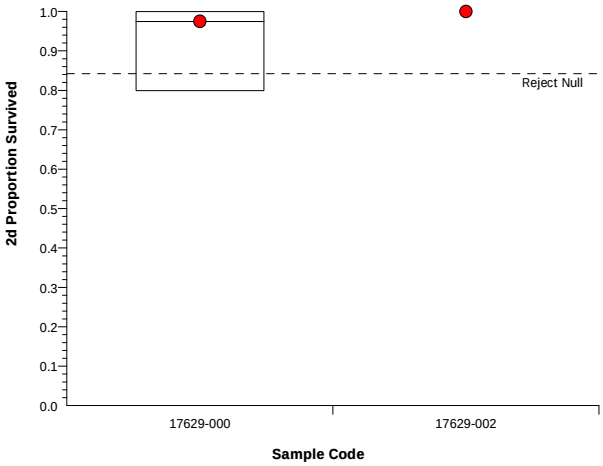
2d Proportion Survived Summary

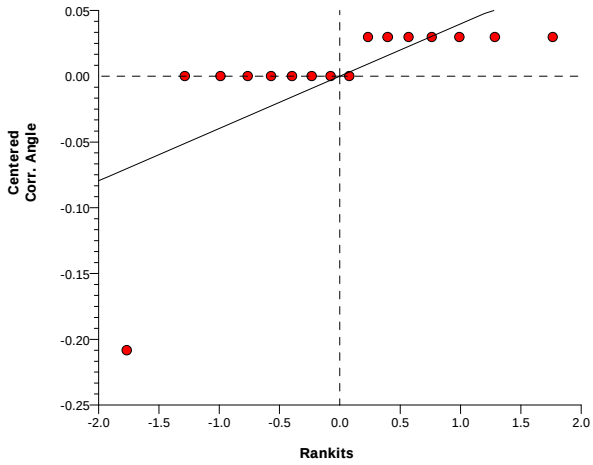
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
17629-002	8	1	1	1	1	1	0	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
17629-002	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-2.26%

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	20-8833-8706	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					9.38%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	2.256	1.761	0.09295	0.0203	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0567079	0.0567079	1	5.091	0.0406	Significant Effect
Error	0.1559467	0.0111391	14			
Total	0.2126546	0.067847	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.143	8.885	0.3361	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8838		0.0445	Normal Distribution

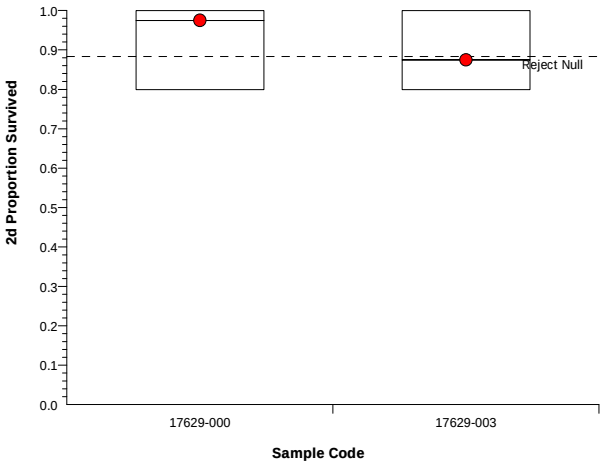
2d Proportion Survived Summary

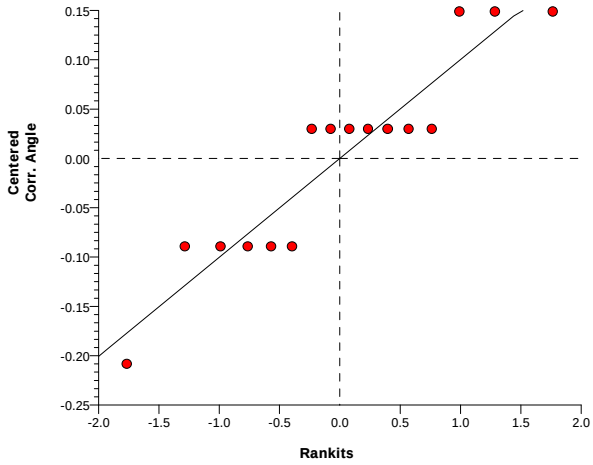
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
17629-003	8	0.875	0.8356	0.9144	0.8	1	0.01922	0.1035	11.83%	10.26%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
17629-003	8	1.196	1.15	1.243	1.107	1.345	0.02289	0.1232	10.3%	9.05%

Graphics





Arbacia punctulata Chronic Fertilization Assay
Water Quality and Gamete Preparation Data

STUDY: 17629	CLIENT: BATTELLE	LOCATION: New Bedford	DATE: 8/22/08 INITIALS: SJ

SALINITY ADJUSTMENT RECORD: 200 mL -001 + 0 g SALT

SALINITY ADJUSTMENT RECORD: 200 mL -002 + 0 g SALT

SALINITY ADJUSTMENT RECORD: 200 mL -003 + 0 g SALT

SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	7.4	7.94	43100	20	29
-001	6.2	7.49	43570	20	29
-002	6.3	7.42	43950	20	29
-003	6.6	7.43	43710	20	28

METERS USED

DO meter # 20 DO probe # 23 pH meter # 470 pH probe # 83 S/C meter # YS130C S/C probe # YS130C

SALINITY meter # YS130C

DATE & INITIALS FOR GAMETE PREPARATION: 8/22/08 CB

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 114 X 10^4 = SPM SOLUTION E = 1.14×10^6

SPERM CONCENTRATIONS:

SOLUTION E X 40 = SOLUTION A = _____ SPM

SOLUTION E X 20 = SOLUTION B = _____ SPM

SOLUTION E X 5 = SOLUTION C = _____ SPM

FINAL COUNTS:

FINAL SPERM COUNT: _____

FINAL EGG COUNT: 2200

TEST TIMES:

SPERM COLLECTED: 1430

EGGS COLLECTED: 1545

SPERM ADDED: 1500

EGGS ADDED: 1600

FIXATIVE ADDED: 1620

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 17629	CLIENT: Battelle - New Bedford	
SPECIES: *A. punctulata*		
	Day: 0	
SAMPLE	Volume Used (mL)	ESI Cube ID
Lab Control		
-001		
-002		
-003		
INITIALS:		
TIME:		
DATE:		

FERTILIZATION COUNTS

STUDY	CLIENT	LOCATION	DATE 8/22/08 1800
	BATTELLE	New Bedford	INITIALS CAS

	REPLICATE VIAL			
	1	2	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100/113	100/111	100/114	100/113
-001	64/116	65/118	71/126	69/119
-002	57/138	39/112	41/126	52/144
-003	31/101	48/117	57/127	24/122

CETIS Summary Report

Report Date: 24 Aug-08 21:56 (p 1 of 1)
Link/Link Code: 09-3716-1892

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Test Run No:	21-0223-1936	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	22 Aug-08 15:00	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	22 Aug-08 16:20	**Species:**	Arbacia punctulata	**Brine:**	Not Applicable
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
17629-000	01-6030-3695	22 Aug-08 14:00	22 Aug-08 14:00	60m	Battelle Labs	Ecological Risk Assessm
17629-003	05-4158-6637	21 Aug-08 15:20	21 Aug-08 18:40	24h		
17629-002	08-5309-8454	21 Aug-08 15:02	21 Aug-08 18:40	24h		
17629-001	09-2317-4687	21 Aug-08 14:20	21 Aug-08 18:40	25h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
17629-000	Marine Monitoring Samp	New Bedford Harbor Dredge Mon	Laboratory Water Control		
17629-003	Marine Monitoring Samp	New Bedford Harbor Dredge Mon	WQ-TOX-003		
17629-002	Marine Monitoring Samp	New Bedford Harbor Dredge Mon	WQ-TOX-002		
17629-001	Marine Monitoring Samp	New Bedford Harbor Dredge Mon	WQ-TOX-001		

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	4	0.887	0.8833	0.8907	0.8772	0.9009	0.001819	0.009962	1.12%	0.0%
17629-003	4	0.3407	0.2984	0.3829	0.1967	0.4488	0.02066	0.1131	33.21%	61.59%
17629-002	4	0.3619	0.3481	0.3758	0.3254	0.413	0.006779	0.03713	10.26%	59.19%
17629-001	4	0.5615	0.5564	0.5665	0.5508	0.5798	0.00247	0.01353	2.41%	36.7%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17629-000	0.885	0.9009	0.8772	0.885
17629-003	0.3069	0.4103	0.4488	0.1967
17629-002	0.413	0.3482	0.3254	0.3611
17629-001	0.5517	0.5508	0.5635	0.5798

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	03-6359-0486	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Aug-08 21:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					9.77%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	9.812	1.943	0.1206	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.742249	0.742249	1	96.27	0.0001	Significant Effect
Error	0.046259	0.00771	6			
Total	0.788508	0.749959	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	59.72	47.47	0.0071	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9256		0.4766	Normal Distribution

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	4	0.887	0.8832	0.8908	0.8772	0.9009	0.00185	0.009962	1.12%	0.0%
17629-003	4	0.3407	0.2976	0.3837	0.1967	0.4488	0.02101	0.1131	33.21%	61.59%

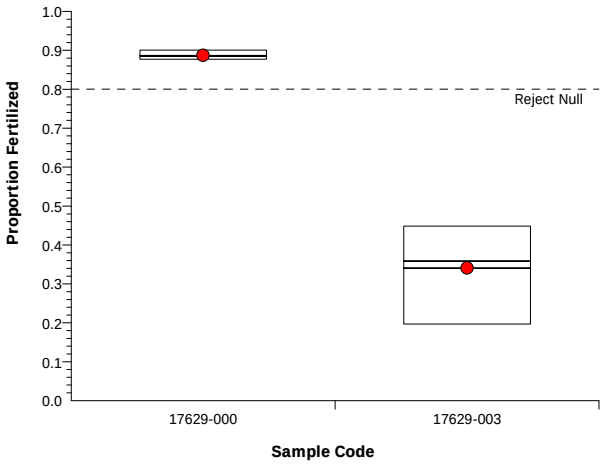
Angular (Corrected) Transformed Summary

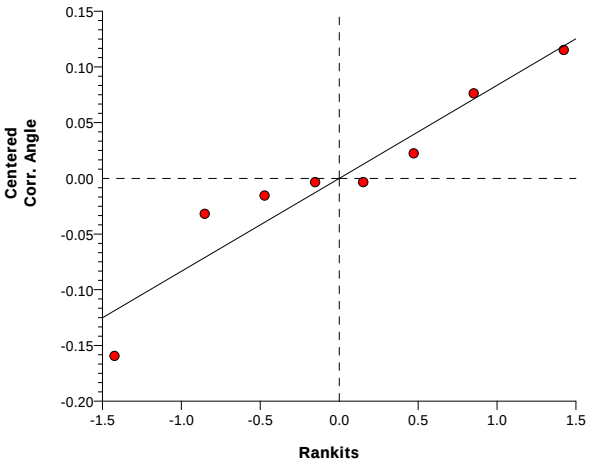
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	4	1.228	1.222	1.234	1.213	1.251	0.002959	0.01594	1.3%	0.0%
17629-003	4	0.619	0.5722	0.6658	0.4595	0.7341	0.02287	0.1231	19.89%	49.6%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17629-000	0.9009	0.885	0.885	0.8772
17629-003	0.4488	0.4103	0.3069	0.1967

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	15-9648-4212	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Aug-08 21:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					3.01%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-002	28	1.943	0.04046	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.679741	0.679741	1	783.9	0.0000	Significant Effect
Error	0.005203	0.000867	6			
Total	0.684943	0.680608	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.829	47.47	0.1817	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9244		0.4669	Normal Distribution

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	4	0.887	0.8832	0.8908	0.8772	0.9009	0.00185	0.009962	1.12%	0.0%
17629-002	4	0.3619	0.3478	0.3761	0.3254	0.413	0.006895	0.03713	10.26%	59.19%

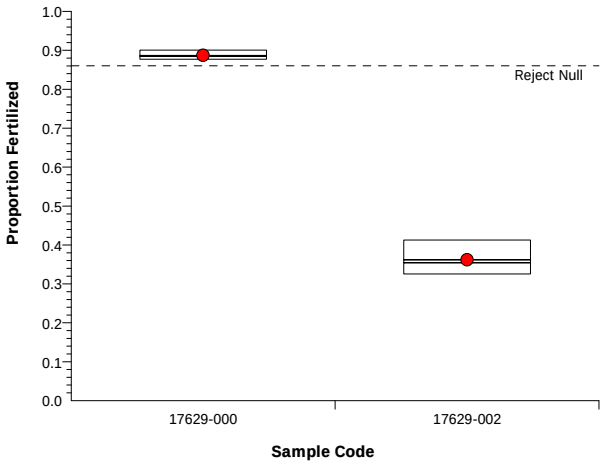
Angular (Corrected) Transformed Summary

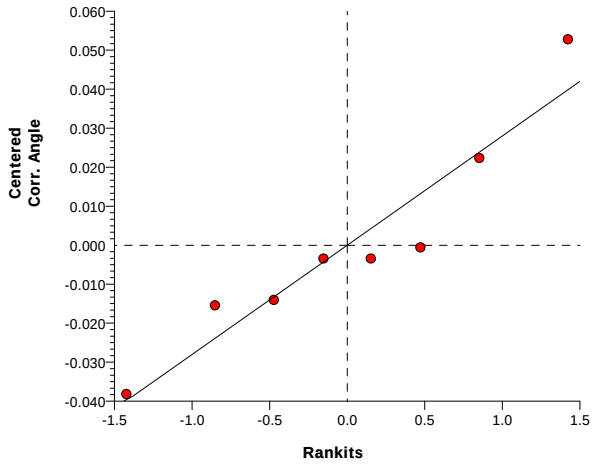
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	4	1.228	1.222	1.234	1.213	1.251	0.002959	0.01594	1.3%	0.0%
17629-002	4	0.6452	0.6306	0.6599	0.607	0.698	0.007145	0.03847	5.96%	47.47%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17629-000	0.9009	0.885	0.885	0.8772
17629-002	0.413	0.3611	0.3482	0.3254

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	12-2981-5646	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Aug-08 21:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.47%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-001	36.33	1.943	0.02038	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.290559	0.290559	1	1320	0.0000	Significant Effect
Error	0.001321	0.000220	6			
Total	0.29188	0.290779	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.364	47.47	0.8050	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8852		0.2111	Normal Distribution

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	4	0.887	0.8832	0.8908	0.8772	0.9009	0.00185	0.009962	1.12%	0.0%
17629-001	4	0.5615	0.5563	0.5666	0.5508	0.5798	0.002512	0.01353	2.41%	36.7%

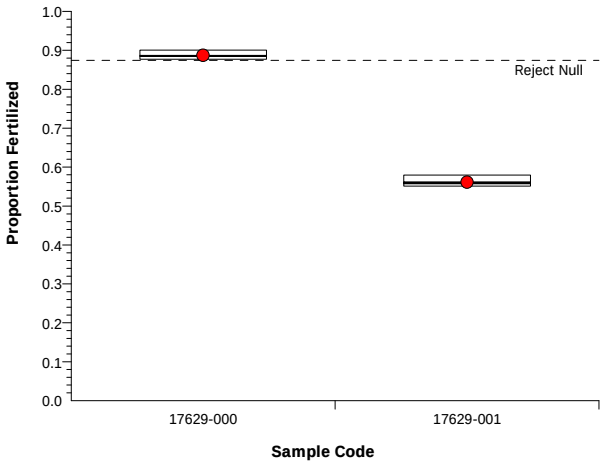
Angular (Corrected) Transformed Summary

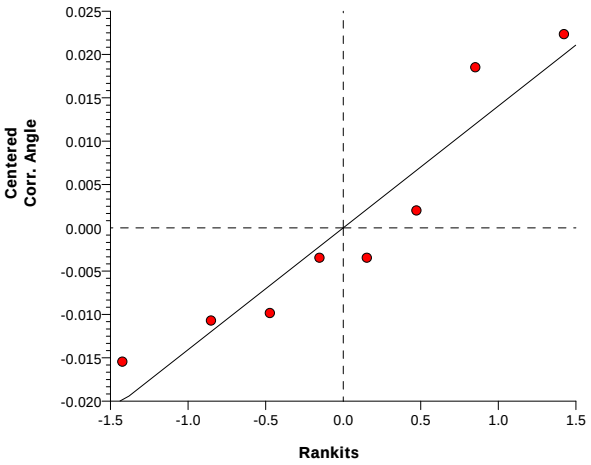
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	4	1.228	1.222	1.234	1.213	1.251	0.002959	0.01594	1.3%	0.0%
17629-001	4	0.847	0.8419	0.8522	0.8363	0.8656	0.002534	0.01365	1.61%	31.03%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17629-000	0.9009	0.885	0.885	0.8772
17629-001	0.5798	0.5635	0.5517	0.5508

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	13-9467-0508	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Aug-08 21:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					34.1%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	-0.4064	1.943	0.1254	0.6507	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001375	0.001375	1	0.1652	0.6986	Non-Significant Effect
Error	0.049938	0.008323	6			
Total	0.051312	0.009697	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	10.24	47.47	0.0876	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9507		0.7182	Normal Distribution

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	4	0.3407	0.2976	0.3837	0.1967	0.4488	0.02101	0.1131	33.21%	0.0%
17629-002	4	0.3619	0.3478	0.3761	0.3254	0.413	0.006895	0.03713	10.26%	-6.24%

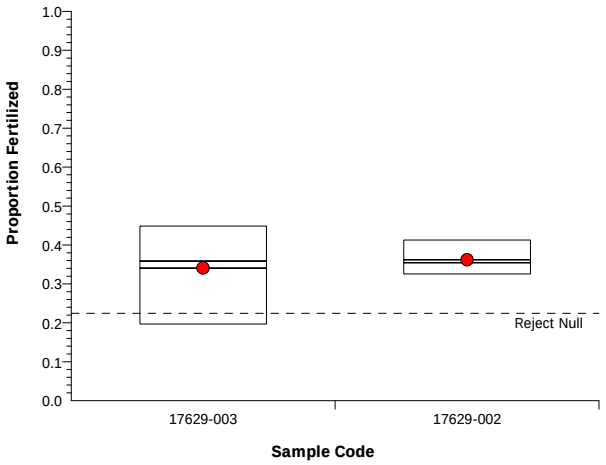
Angular (Corrected) Transformed Summary

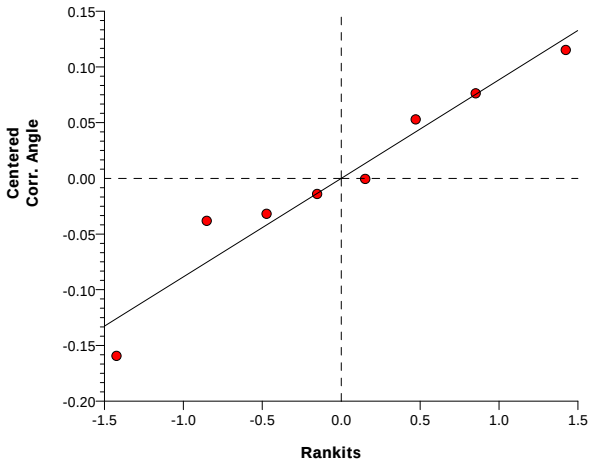
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	4	0.619	0.5722	0.6658	0.4595	0.7341	0.02287	0.1231	19.89%	0.0%
17629-002	4	0.6452	0.6306	0.6599	0.607	0.698	0.007145	0.03847	5.96%	-4.24%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17629-003	0.4488	0.4103	0.3069	0.1967
17629-002	0.413	0.3611	0.3482	0.3254

Graphics





CETIS Analytical Report

Link/Link Code: 09-3716-1892

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	11-9401-6946	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Aug-08 21:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					32.87%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-001	-3.681	1.943	0.1204	0.9948	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.104009	0.104009	1	13.55	0.0103	Significant Effect
Error	0.046056	0.007676	6			
Total	0.150064	0.111684	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	81.43	47.47	0.0045	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9222		0.4481	Normal Distribution

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	4	0.3407	0.2976	0.3837	0.1967	0.4488	0.02101	0.1131	33.21%	0.0%
17629-001	4	0.5615	0.5563	0.5666	0.5508	0.5798	0.002512	0.01353	2.41%	-64.81%

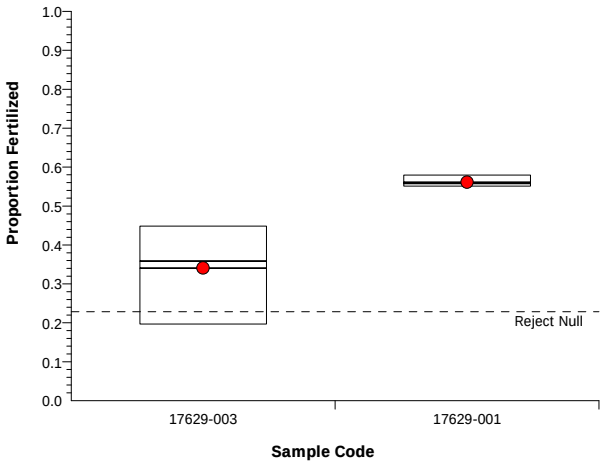
Angular (Corrected) Transformed Summary

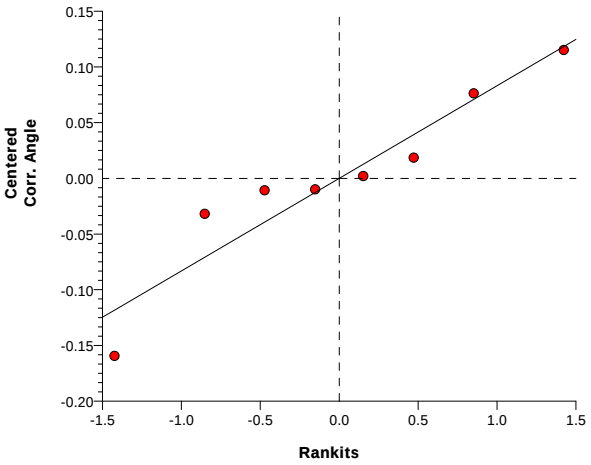
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	4	0.619	0.5722	0.6658	0.4595	0.7341	0.02287	0.1231	19.89%	0.0%
17629-001	4	0.847	0.8419	0.8522	0.8363	0.8656	0.002534	0.01365	1.61%	-36.84%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17629-003	0.4488	0.4103	0.3069	0.1967
17629-001	0.5798	0.5635	0.5517	0.5508

Graphics





Saskatchewan Research Council
15 Innovation Boulevard, Saskatoon, SK S7N 2X8
Phone: 306-933-5469

Test Data Summary

SAMPLE			SRC#	598, 599, 600
Identification/Name	001, 002, 003 (also labeled Batelle)			
Date Shipped	Aug 22/08			
Date/Time Received	Aug 25/08 4 pm	Test Initiation Date		Aug 25/08
Temperature Upon Receipt (°C)	21	Test Completion Date		Sept 2/08

ORGANISM INFORMATION			
Species	*Champia parvula*	Appearance/Health of Champia	excellent
Source	sexually mature male and female branches, obtained from USEPA, Hatfield Marine Science Center, Newport, Oregon in 1995		
Females, Presence of Trichognes	yes	Males, Presence of Sori with Spermatia	yes

TEST CONDITIONS			
Test Method	EPA 821-R-02-014, Method 1009.0 Third edition, October 2002	Dilution water	Natural seawater from Pacific Environmental Science Centre, North Vancouver B.C. as described on page 1
Test Type	static, non-renewal; two day effluent exposure followed by five to seven day recovery period in control medium for cystocarp development		
Test Vessels (Exposure & Recovery)	270 mL transparent polystyrene cups, transparent polystyrene lids		
Exposure Vessel Volume / Depth	100 mL / 4.5 cm	Recovery Vessel Volume /Depth	200 mL / 7.3 cm
Replicates/Conc.	3	No. of organisms (female/male)	5/2
Number and Concentrations of Test Solutions (%v/v)		Controls: (two) natural sea water, salt Tests: all samples tested at 100%	
Chemicals added to control/dilution water	Test Nutrients as described in method cited at 10 mL/L, analytical grade		

SAMPLE TREATMENT					
D.O. on sample without salinity adjustment (mg/L)	See pg 3	D.O. after salinity adjustment (mg/L)			Page 3
Aeration (duration/rate)	none	Filtration	none	pH Adjustments	none
Salinity Adjustment*	Not required				
Dry Salt for Salinity Adjustment*					
** as per EC guidance document on salinity adjustment, Dec 2001*					

EXPOSURE PERIOD (48 h) and RECOVERY PERIOD (5-7 days)			
Temperature, pH, D.O. and Salinity of test solutions and controls on following page			
Photoperiod (L:D h)	16:8	Agitation of tests and controls during exposure	gentle rotary shaking
Recovery Medium: natural sea water containing 10 mL/L Culture Nutrients (section 16.10.1.3 of cited method), prepared from analytical grade chemicals			
Aeration during recovery: gentle aeration supplied			

Date/Initial Aug 7/08 [illegible]

Saskatchewan Research Council
15 Innovation Boulevard, Saskatoon, SK S7N 2X8
Phone: 306-933-5469

Water Quality Data

Sample Identification/Name	001, 002, 003 (also labeled Batelle)	598, 599, 600

INITIAL WATER QUALITY	SAMPLE at test start, without salinity adjustment			TEST MEDIUM	RECOVERY MEDIUM
Sample #	598	599	600		
Temperature (°C)	22	22	22	22	22
Dissolved Oxygen (mg/L)	7.6	7.6	7.6	7.8	7.8
pH	7.56	7.56	7.52	8.52	8.55
Salinity (ppt)	30	30	30	30	30
Sample Description	Clear liquid	Clear liquid	Clear liquid	Length of Recovery Period (days)	5

Water Quality Data during Exposure Period (0, 24, 48 hr)

Concentration % (v/v)	Temperature (°C) exposure			Dissolved Oxygen (mg/L) exposure			pH exposure			Salinity (ppt) exposure		
	0	24	48	0	24	48	0	24	48	0	24	48
Control NSW[1]	23	23	23	7.8	8.3	7.9	8.52	8.98	8.84	30	30	30
598	23	23	23	7.6	8.1	7.7	7.56	8.55	8.41	30	30	30
599	22	23	23	7.6	8.1	7.7	7.56	8.58	8.41	30	30	30
600	22	23	23	7.6	8.2	7.7	7.52	8.65	8.80	29	30	30

Recovery Period – Temperature Monitoring (initial daily entries)

Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
23	23	23	23	23	23	-	-

Champia (female) Mortality at end of Recovery Period

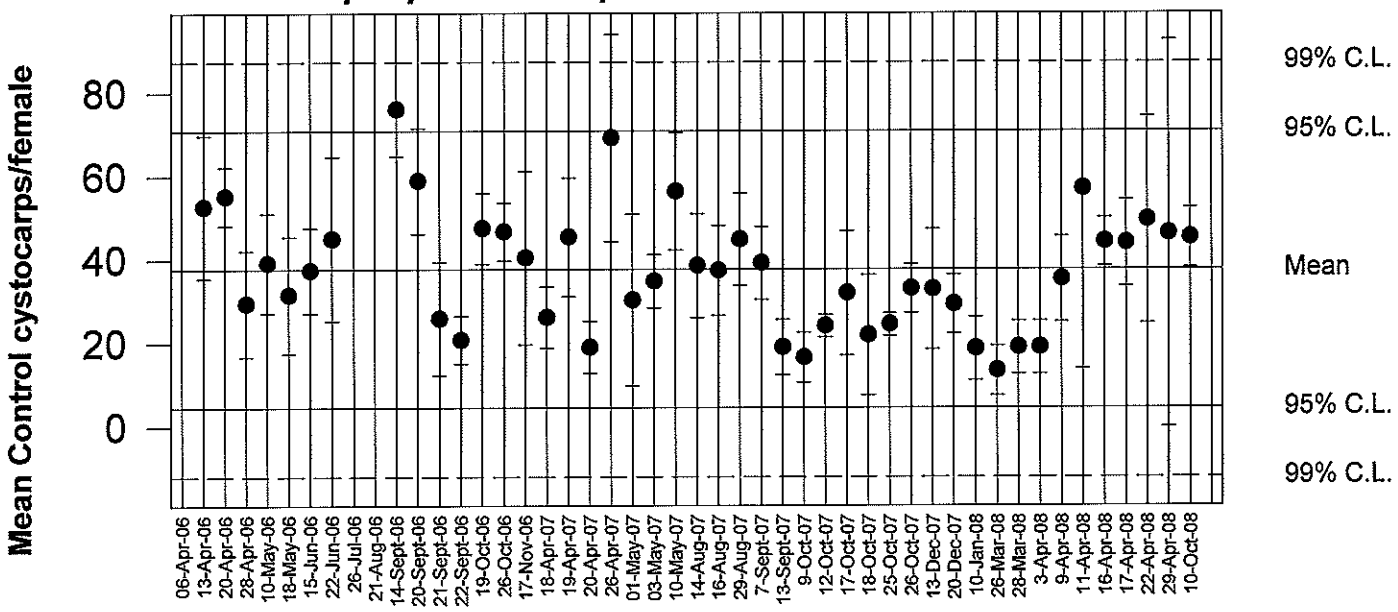
Concentration %v/v	control	598	599	600
	NSW[1]	100%	100%	100%
# Females dead[2]	0	0	0	0
% Mortality[2]	0	0	0	0
Description	Normal red	Green with red tips	Green with red tips	Normal red

1 NSW natural sea wate
2 same for all test units at each concentration

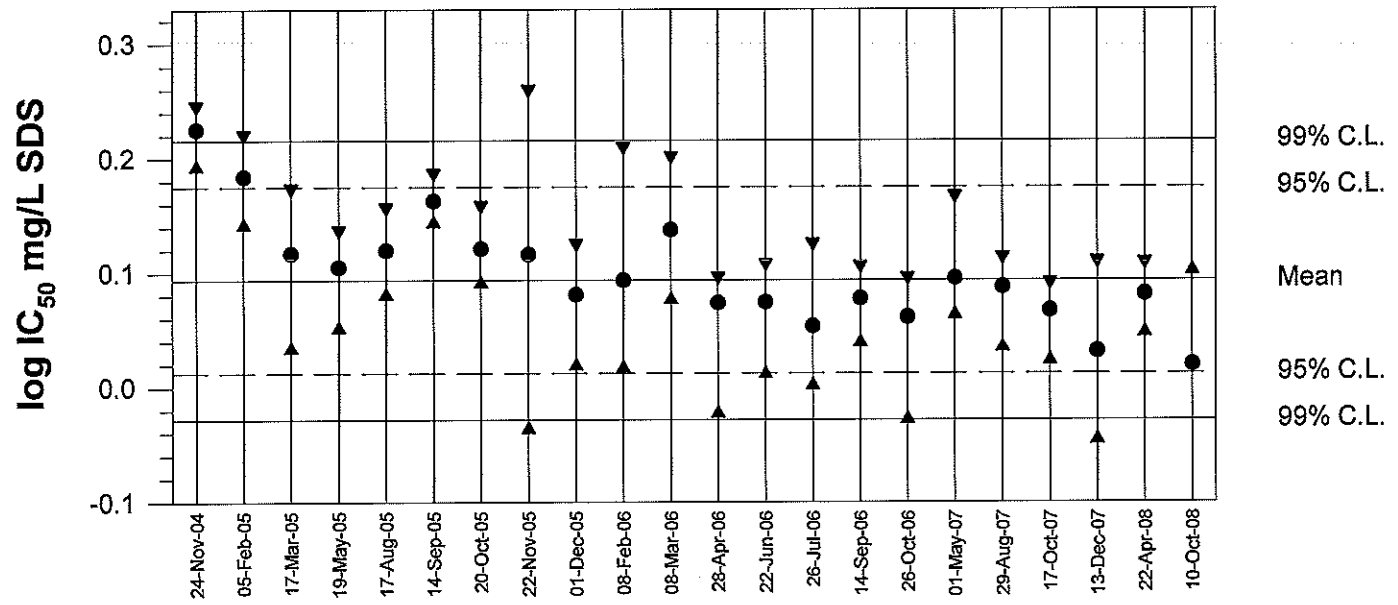
Date/Initial Nov 7/08 [illegible]

Saskatchewan Research Council

Champia parvula Reproduction Test Control Charts



Control cystocarp count per female *Champia parvula* for tests from Apr 2006 to Oct 2008. Mean and 95% control limits for each test and cumulative mean, 95% and 99% control limits for all tests.
Cumulative mean: 37.7 (95% CL: 4-71)



Reference Toxicant Tests using Sodium dodecyl sulfate mg/L
Historical value (previous 20 tests) and 95% confidence limits 1.25 (1.05 - 1.48) mg/L
Data for most recent test
Oct 10/08: mean and 95% confidence limits 1.05 (0.83 - 1.26) mg/L

CETIS Summary Report

Link/Link Code: 10-0154-2522

Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Test Run No:	06-5260-4165	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Aug-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	01 Sep-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
17629-000	01-6030-3695	22 Aug-08 14:00	22 Aug-08 14:00	94h	Battelle Labs	Ecological Risk Assessme
17629-003	05-4158-6637	21 Aug-08 15:20	21 Aug-08 18:40	4d 21h		
17629-002	08-5309-8454	21 Aug-08 15:02	21 Aug-08 18:40	4d 21h		
17629-001	09-2317-4687	21 Aug-08 14:20	21 Aug-08 18:40	4d 22h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
17629-000	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	Laboratory Water Control		
17629-003	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-003		
17629-002	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-002		
17629-001	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-001		

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	3	10.53	10.15	10.92	9.4	11.4	0.1874	1.026	9.74%	0.0%
17629-003	4	4.9	4.467	5.333	3.8	6.4	0.2119	1.16	23.68%	53.48%
17629-002	4	0.1	0.05688	0.1431	0	0.2	0.02108	0.1155	115.5%	99.05%
17629-001	4	0	0	0	0	0	0	0		100.0%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17629-000	11.4	9.4	10.8	
17629-003	4.2	6.4	5.2	3.8
17629-002	0.2	0.2	0	0
17629-001	0	0	0	0

CETIS Analytical Report

Link/Link Code: 10-0154-2522

Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	20-5412-1382	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	04 Sep-08 14:36	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	06-5260-4165	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Aug-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	01 Sep-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					23.01%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-001	8.445	1.943	1.127	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	48.02	48.02	1	71.32	0.0002	Significant Effect
Error	4.04	0.6733333	6			
Total	52.06	48.69333	7			

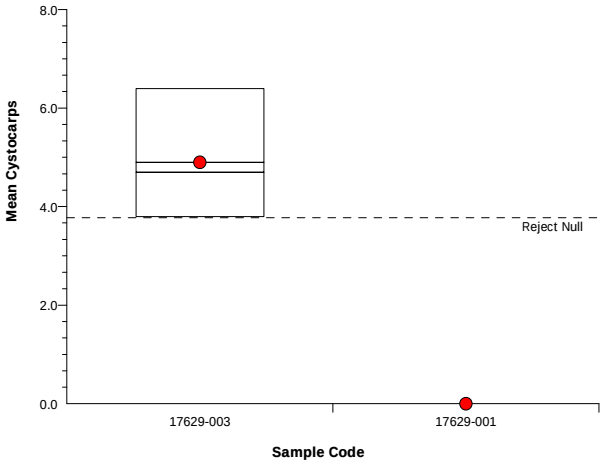
ANOVA Assumptions

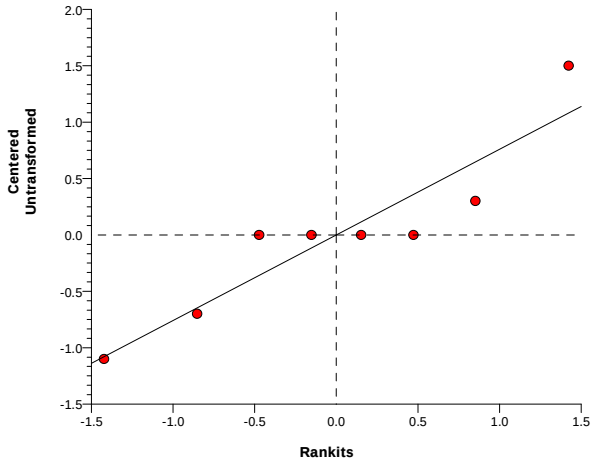
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	10.13	13.75	0.0190	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8837		0.2041	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	4	4.9	4.459	5.341	3.8	6.4	0.2155	1.16	23.68%	0.0%
17629-001	4	0	0	0	0	0	0	0		100.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	17-5336-3770	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	04 Sep-08 14:36	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	06-5260-4165	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Aug-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	01 Sep-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					23.12%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	8.232	1.943	1.133	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	46.08	46.08	1	67.76	0.0002	Significant Effect
Error	4.08	0.68	6			
Total	50.16	46.76	7			

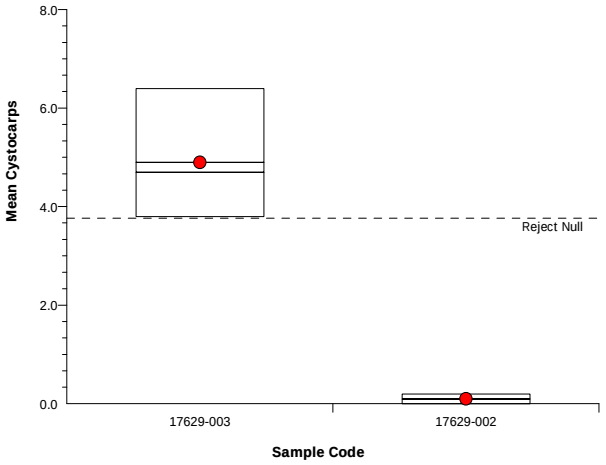
ANOVA Assumptions

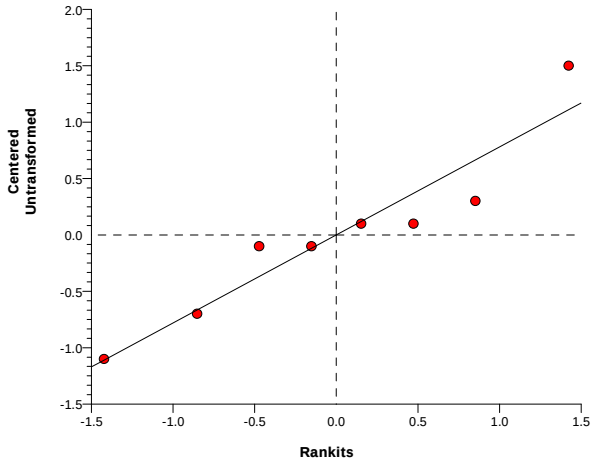
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	101	47.47	0.0033	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9184		0.4174	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	4	4.9	4.459	5.341	3.8	6.4	0.2155	1.16	23.68%	0.0%
17629-002	4	0.1	0.05608	0.1439	0	0.2	0.02144	0.1155	115.5%	97.96%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	06-4939-5819	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	04 Sep-08 14:36	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	06-5260-4165	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Aug-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	01 Sep-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					16.43%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-001	17.78	2.92	1.73	0.0016	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	190.2019	190.2019	1	451.4	0.0000	Significant Effect
Error	2.106667	0.4213333	5			
Total	192.3086	190.6232	6			

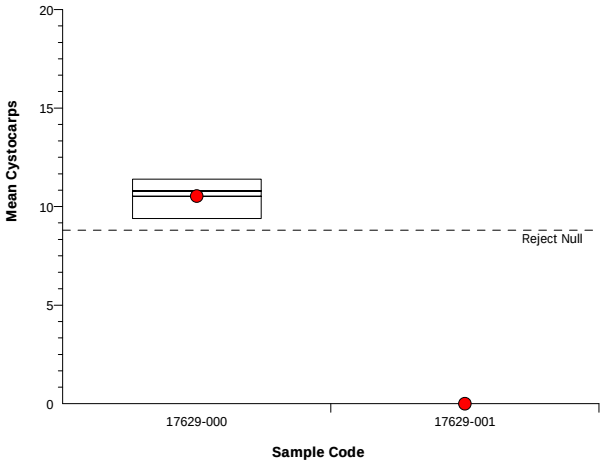
ANOVA Assumptions

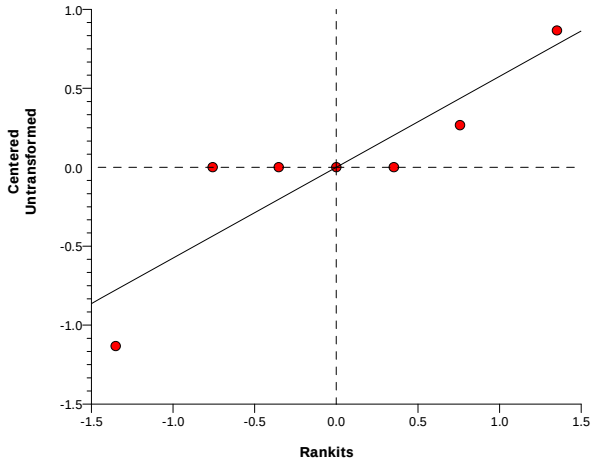
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	22.32	16.26	0.0052	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8359		0.0910	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	3	10.53	10.14	10.92	9.4	11.4	0.1906	1.026	9.74%	0.0%
17629-001	4	0	0	0	0	0	0	0		100.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	09-1907-8467	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	04 Sep-08 14:36	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	06-5260-4165	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Aug-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	01 Sep-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					16.5%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-002	17.52	2.92	1.738	0.0016	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	186.6076	186.6076	1	434.6	0.0000	Significant Effect
Error	2.146667	0.4293333	5			
Total	188.7543	187.037	6			

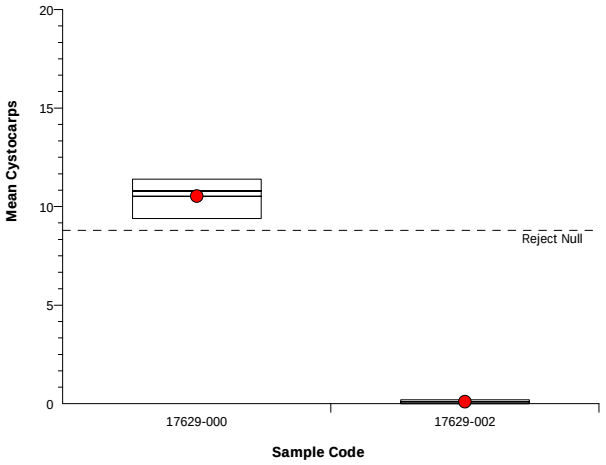
ANOVA Assumptions

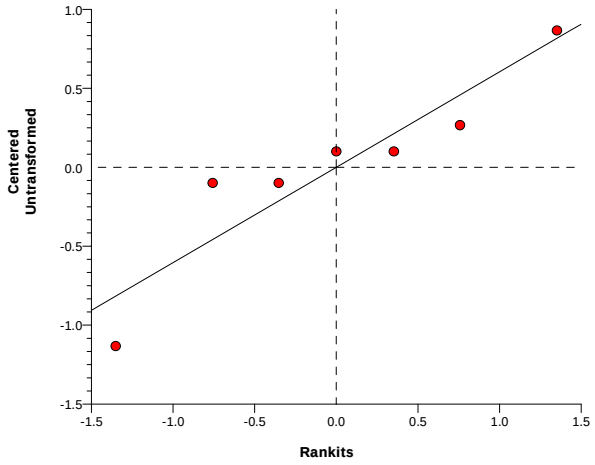
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	79	49.8	0.0051	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8943		0.2978	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	3	10.53	10.14	10.92	9.4	11.4	0.1906	1.026	9.74%	0.0%
17629-002	4	0.1	0.05608	0.1439	0	0.2	0.02144	0.1155	115.5%	99.05%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	12-0365-3524	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	04 Sep-08 14:36	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	06-5260-4165	**Test Type:**	Champia	**Analyst:**	
Start Date:	26 Aug-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	01 Sep-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					16.2%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	6.652	2.015	1.706	0.0006	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	54.40191	54.40191	1	44.25	0.0012	Significant Effect
Error	6.146667	1.229333	5			
Total	60.54857	55.63124	6			

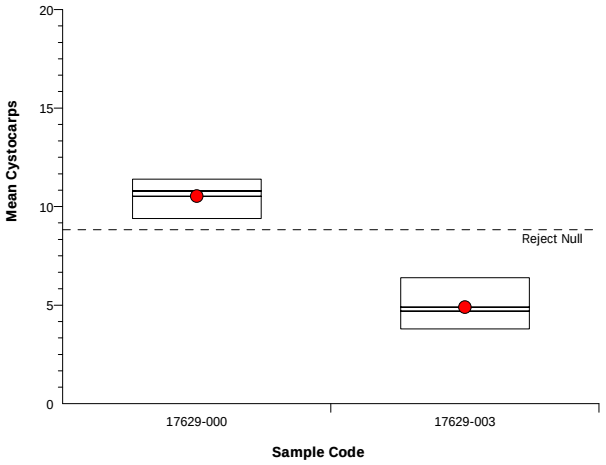
ANOVA Assumptions

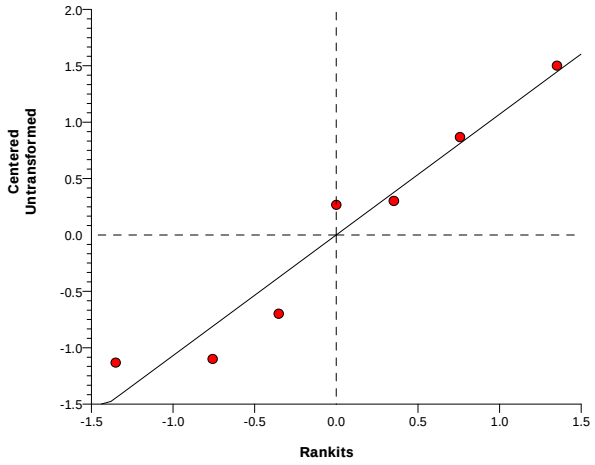
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.278	199.2	0.9343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9199		0.4688	Normal Distribution

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	3	10.53	10.14	10.92	9.4	11.4	0.1906	1.026	9.74%	0.0%
17629-003	4	4.9	4.459	5.341	3.8	6.4	0.2155	1.16	23.68%	53.48%

Graphics





Americamysis bahia 7 DAY CHRONIC ASSAY
SAMPLE USE RECORD

STUDY: 17629 **CLIENT:** BATTELLE - New Bedford

SPECIES: *A. bahia* **TEST:** chronic renewal

Sample	Day: 0 Volume Used (mL)	Day: 0 ESI Cube ID	Day: 1 Volume Used (mL)	Day: 1 ESI Cube ID	Day: 2 Volume Used (mL)	Day: 2 ESI Cube ID
Lab Control	1600	n/a	1200	n/a	1200	n/a
-001	↓	~~1600~~ -001	↓	-001	↓	-001
-002	↓	-002	↓	-002	↓	-002
-003	↓	-003	↓	-003	↓	-003

Day	Date	Time	Init
0	8/22/08	1150	SJ
1	8/23	1530	DM
2	8/24	1700	LB
3	8/25	1600	SJ
4	8/26	1000	APC
5	8/27	1250	SJ
6	8/28	1215	APC

Sample	Day: 3 Volume Used (mL)	Day: 3 ESI Cube ID	Day: 4 Volume Used (mL)	Day: 4 ESI Cube ID	Day: 5 Volume Used (mL)	Day: 5 ESI Cube ID
Lab Control	1200	n/a	1200	n/a	1200	n/a
-001	↓	-001	↓	-001	↓	-001
-002	↓	-002	↓	-002	↓	-002
-003	↓	-003	↓	-003	↓	-003

Sample	Day: 6 Volume Used (mL)	Day: 6 ESI Cube ID
Lab Control	1200	n/a
-001	↓	-001
-002	↓	-002
-003	↓	-003

Americamysis bahia 7 DAY CHRONIC ASSAY
NEW WATER QUALITIES

STUDY:	CLIENT:	LOCATION:	LAB CONTROL:
17629	BATTELLE	NEW BEDFORD	HAMPTON ESTUARY

		NEW DISSOLVED OXYGEN (mg/L)							NEW SALINITY (ppt)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	7.4	6.6	7.3	6.8	7.1	7.0	7.2	29	28	28	29	30	29	29
-001	A	6.2	6.6	7.4	6.8	7.0	7.1	7.3	29	29	29	29	29	29	29
-002	A	6.3	6.0	7.5	6.9	7.1	6.8	7.3	29	29	29	29	29	29	29
-003	A	6.6	6.3	7.6	6.9	7.0	6.9	7.6	28	28	28	28	28	29	28

		NEW pH (SU)							NEW TEMPERATURE (°C)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	7.94	8.10	8.22	8.25	7.91	7.86	7.86	24	24	24	24	24	24	24
-001	A	7.49	7.64	7.78	7.62	7.39	7.37	7.42	24	24	24	24	24	24	24
-002	A	7.42	7.62	7.76	7.69	7.42	7.46	7.68	24	25	24	24	24	24	24
-003	A	7.43	7.66	7.75	7.73	7.44	7.48	7.70	24	25	24	24	24	24	24
INC TEMP:		25	25	25	25	25	25	25							
DATE:		8/22/08	8/23	8/24	8/25	8/26	8/27	8/28							
TIME:		1200	1600	1710	1605	1015	1300	1230							
INIT:		SJ	DM	UB	SJ	APC	SJ	APC							

WATER QUALITY METERS USED NEW WATER QUALITIES								
	0	1	2	3	4	5	6	7
Water Quality Station #		1	1	1	2	2	1	
Initials		DM	UB	SJ	APC	SJ	APC	
Date	8/22/08	8/23	8/24	8/25	8/26	8/27	8/28	

Americamysis bahia 7 DAY CHRONIC ASSAY
OLD WATER QUALITIES

STUDY: 17629	CLIENT: BATTELLE	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY

OLD SALINITY (ppt)									OLD pH (SU)						
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	A	28	28	28	28	31	29	29	8.01	8.03	7.79	7.71	7.93	7.93	7.79
-001	A	30	29	30	29	30	30	30	7.67	7.88	7.69	7.53	7.76	7.77	7.77
-002	A	30	30	30	30	30	30	30	7.76	7.93	7.67	7.65	7.70	7.81	7.81
-003	A	29	29	30	29	29	29	29	7.90	7.93	7.68	7.55	7.73	7.86	7.80

OLD TEMPERATURE (°C)								
Conc	Rep	1	2	3	4	5	6	7
Control	A	25	24	24	24	24	24	24
-001	A	25	24	24	24	24	24	24
-002	A	25	24	24	24	24	24	24
-003	A	25	24	24	24	24	24	24
INC TEMP:		25	25	25	25	25	25	25
DATE:		8/23/08	8/24	8/25	8-26	8/27	8-28	8/29
TIME:		1530	1045	1515	0920	1200	1145	1540
INITIALS:		DM	UB	SJ	APC	SJ	APC	UB

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

- Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution
- 8 replicates per site with 5 organisms each

- Test Temperature: 26±1°C
- Salinity: 25 ±2ppt
- Dissolved Oxygen: >4.3 mg/L

- Photoperiod will be 16 hours light and 8 hours dark.
- Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

WATER QUALITY METERS USED OLD WATER QUALITIES								
	0	1	2	3	4	5	6	7
Water Quality Station #		1	1	2	2	1	1	1
Initials		DM	UB	SJ	APC	SJ	APC	UB
Date	8/22/08	8-23-08	8/24	8/25	8-26	8/27	8-28	8/29

SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 17629	LOCATION: New Bedford Harbor				
CHEMISTRY	Lab Salt Control	-001	-002	-003	
AMMONIA	17594 -001	-004	-005	-006	
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	
SALINITY (ppt)	29	28.6	29.2	28.2	
pH (SU)	7.94	7.42	7.45	7.55	
TRC (mg/L)	<0.02	<0.02	<0.02	<0.02	
DO (mg/L)	7.4	6.2	6.1	6.6	
S/C (µmhos/cm)	43100	43570	43950	43710	
WQ STATION USED	2	2	2	2	
INITIALS	SJ	SJ	SJ	SJ	
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	
SAMPLE (mLs)					
SEA SALT (g)					
DATE:	8/22/08	8/22/08	8/22/08	8/22/08	
TIME:	1030	1030	1030	1030	
INITIALS:	SJ	SJ	SJ	SJ	

Sample ID	ESI Cube ID
17629 -001	17629 -001
17629 -002	17629 -002
17629 -003	17629 -003

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Americamysis bahia

Source: Lab reared ✓ Hatchery reared _____ Field collected _____

Hatch date 08/15/08 Receipt date _____

Lot number 081508MS Strain ARO

Brood origination FL

II. Water Quality

Temperature 25 °C Salinity 28 ppt D.O. SAT ppm

pH 8.3 su Hardness — ppm Alkalinity — ppm

III. Culture Conditions

Freshwater _____ Saltwater X Other _____

Recirculating _____ Flow through X Static _____

DIET: Flake food _____ Phytoplankton _____ Trout chow _____

Artemia X Rotifers _____ YCT _____ Other _____

Prophylactic treatments: _____

Comments: 7 DAYS

IV. Shipping Information

Client: ESI # of Organisms 300

Carrier: PICK UP Date shipped 8/22/08

Biologist: Stan Lemtski

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

Americamysis bahia 7 DAY CHRONIC ASSAY
SURVIVAL & OLD WATER QUALITIES

STUDY: 17699	CLIENT: Battelle	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY	ORGANISM BATCH/LOT#

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Lab Control	A	5	5	5	5	5	5	5	5	6.7	5.2	6.0	6.2	6.5	6.4	6.3
	B	5	5	5	5	5	5	5	5	6.6	5.6	5.9	6.2	6.3	6.3	6.2
	C	5	5	4	4	4	4	4	4	6.6	5.8	5.9	6.1	6.3	6.3	6.1
	D	5	5	5	5	5	5	5	5	6.6	5.8	5.8	6.0	6.2	6.3	6.2
	E	5	5	5	5	5	5	5	5	6.6	5.6	5.9	6.2	6.0	6.3	6.3
	F	5	5	5	5	5	5	5	5	6.6	5.6	5.9	6.1	6.1	6.2	6.0
	G	5	5	5	5	5	5	5	5	6.6	5.4	5.8	6.2	6.2	6.2	5.8
	H	5	5	5	5	5	5	5	5	6.6	5.7	5.6	6.0	6.3	6.2	5.8
-001	A	5	5	5	4	4	4	4	4	6.6	6.1	6.2	6.1	5.7	6.3	5.9
	B	5	5	5	5	5	5	5	5	6.6	6.0	6.1	6.1	5.8	6.2	5.9
	C	5	5	5	5	5	5	5	5	6.6	6.0	6.1	6.2	5.9	6.2	5.9
	D	5	5	5	5	5	5	5	5	6.5	6.0	6.0	6.1	5.9	6.2	5.8
	E	5	5	4	4	4 5	4	4	4	6.5	6.1	6.0	6.1	5.9	6.1	5.7
	F	5	5	3	3	4 3	3	3	2	6.6	5.9	5.9	6.0	5.8	6.1	5.7
	G	5	5	5	5	5	5	5	5	6.5	6.0	5.9	6.1	5.4	6.0	5.7
	H	5	5	5	5	5	5	5	5	6.5	6.0	5.9	6.1	5.5	6.1	5.7
-002	A	5	5	5	5	5	5	5	5	6.3	5.9	5.9	6.0	5.7	6.2	5.8
	B	5	5	5	5	5	5	5	5	6.4	5.8	5.9	5.9	5.6	6.0	5.8
	C	5	5	5	5	5	5	5	5	6.5	5.8	5.9	5.9	5.7	6.0	5.8
	D	5	5	5	5	5	5	5	5	6.5	5.8	6.0	6.0	5.7	6.0	5.9
	E	5	5	4	4	4	4	4	4	6.5	6.1	6.0	6.0	5.9	6.1	5.9
	F	5	5	5	5	5	5	5	5	6.6	5.9	6.0	6.1	5.9	6.1	5.8
	G	5	5	5	5	5	5	5	5	6.4	5.8	6.0	6.1	5.9	6.1	5.7
	H	5	5	5	5	5	5	5	5	6.5	5.9	6.0	6.1	5.9	6.1	5.6
INC TEMP:		25	25	25	25	25	25	25	25							
DATE:		10/2/08	10/3	10/4	10-5	10/6	10.7	10.8	10.9							
TIME:		1415	1030	0930	1045	1040	0930	1005	0900							
INITIALS:		WM	SJ	DM	DM	SJ	APC	APC	APC							

Americamysis bahia 7 DAY CHRONIC ASSAY
SURVIVAL & OLD WATER QUALITIES

STUDY:	CLIENT:	LOCATION:	LAB CONTROL:	ORGANISM BATCH/LOT#
17699	Battelle	NEW BEDFORD	HAMPTON ESTUARY	

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
-003	A	5	5	5	5	5	5	5	5	6.4	5.8	6.0	6.1	6.1	6.1	5.6
	B	5	5	5	5	5	5	5	5	6.4	5.7	6.0	6.0	6.1	6.0	6.7
	C	5	5	5	5	5	5	5	5	6.4	5.9	6.1	6.1	6.0	6.1	5.9
	D	5	5	5	5	5	5	5	5	6.4	6.0	6.1	6.1	6.1	6.1	5.9
	E	5	5	5	5	5	*3	3	3	6.5	6.1	6.1	5.8	6.0	6.1	5.9
	F	5	5	5	5	5	5	5	5	6.4	5.8	5.9	5.6	6.0	6.1	5.8
	G	5	5	5	5	5	5	5	5	6.4	5.9	5.8	5.4	5.9	6.0	5.9
	H	5	5	5	5	5	5	4	4	6.4	5.9	5.9	5.8	5.9	6.1	6.0
-004	A															
	B															
	C															
	D															
	E															
	F	5	10/3/08													
	G															
	H															
INC TEMP:		25	25	25	25	25	25	25	25							
DATE:		10/2/08	10/3	10/4	10-5	10/6	10-7	10-8	10-9							
TIME:		1415	1030	1010	1045	1040	0930	1005	0900							
INITIALS:		CJM	SJ	DM	JM	LB	APL	APL	APL							

CAR 144 - spilled beaker lost 2 organisms

CETIS Summary Report

Link/Link Code: 12-8828-8740/17629Ab

Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
17629-000	01-6030-3695	22 Aug-08 14:00	22 Aug-08 14:00	N/A	Battelle Labs	Ecological Risk Assessme
17629-003	05-4158-6637	21 Aug-08 15:20	21 Aug-08 18:40	22h		
17629-002	08-5309-8454	21 Aug-08 15:02	21 Aug-08 18:40	22h		
17629-001	09-2317-4687	21 Aug-08 14:20	21 Aug-08 18:40	23h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
17629-000	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	Laboratory Water Control		
17629-003	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-003		
17629-002	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-002		
17629-001	Marine Monitoring Samp	New Bedford Harbor Dredge Moni	WQ-TOX-001		

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
01-1164-5507	7d Proportion Survived	Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria
12-8117-9100	7d Proportion Survived	Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria
20-9815-6064	7d Proportion Survived	Control Resp	0.95	0.8 - NL	Yes	Passes acceptability criteria
06-0667-4011	Mean Dry Biomass-mg	Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
12-1684-2765	Mean Dry Biomass-mg	Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
12-3514-5195	Mean Dry Biomass-mg	Control Resp	0.217	0.2 - NL	Yes	Passes acceptability criteria
01-0309-5887	Mean Dry Biomass-mg	PMSD	0.3055	0.11 - 0.37	Yes	Passes acceptability criteria
01-1989-7363	Mean Dry Biomass-mg	PMSD	0.3031	0.11 - 0.37	Yes	Passes acceptability criteria
06-0667-4011	Mean Dry Biomass-mg	PMSD	0.182	0.11 - 0.37	Yes	Passes acceptability criteria
12-1684-2765	Mean Dry Biomass-mg	PMSD	0.1729	0.11 - 0.37	Yes	Passes acceptability criteria
12-3514-5195	Mean Dry Biomass-mg	PMSD	0.4228	0.11 - 0.37	Yes	Fails acceptability criteria

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9486	1	0.8	1	0.01291	0.07071	7.25%	0.0%
17629-003	8	0.875	0.8363	0.9137	0.8	1	0.0189	0.1035	11.83%	10.26%
17629-002	8	1	1	1	1	1	0	0	0.0%	-2.56%
17629-001	8	1	1	1	1	1	0	0	0.0%	-2.56%

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9154	0.9846	0.8	1	0.0169	0.09258	9.75%	0.0%
17629-003	8	0.85	0.7972	0.9028	0.6	1	0.02582	0.1414	16.64%	10.53%
17629-002	8	0.925	0.8863	0.9637	0.8	1	0.0189	0.1035	11.19%	2.63%
17629-001	8	0.875	0.8066	0.9434	0.6	1	0.03345	0.1832	20.94%	7.9%

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2093	0.2247	0.184	0.242	0.003769	0.02065	9.51%	0.0%
17629-003	8	0.3215	0.267	0.376	0.208	0.598	0.02663	0.1459	45.37%	-48.16%
17629-002	8	0.263	0.2406	0.2854	0.192	0.364	0.01095	0.05997	22.8%	-21.2%
17629-001	8	0.3012	0.2801	0.3224	0.212	0.384	0.01033	0.0566	18.79%	-38.82%

Americamysis 7-d Survival, Growth and Fecundity Test **EnviroSystems, Inc.**

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2194	0.2404	0.194	0.2875	0.00513	0.0281	12.22%	0.0%
17629-003	8	0.3744	0.3232	0.4257	0.212	0.598	0.02507	0.1373	36.67%	-62.84%
17629-002	8	0.2844	0.2637	0.3051	0.21	0.364	0.01013	0.05548	19.51%	-23.68%
17629-001	8	0.3524	0.3262	0.3786	0.254	0.4525	0.01279	0.07008	19.89%	-53.26%

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	1	0.8
17629-003	0.8	1	0.8	0.8	0.8	0.8	1	1
17629-002	1	1	1	1	1	1	1	1
17629-001	1	1	1	1	1	1	1	1

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	0.8	1	1	1	1	0.8
17629-003	0.6	1	0.8	0.8	0.8	0.8	1	1
17629-002	1	1	1	0.8	1	1	0.8	0.8
17629-001	1	0.6	1	0.8	0.6	1	1	1

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.224	0.194	0.23	0.216	0.242	0.238	0.208	0.184
17629-003	0.21	0.212	0.268	0.208	0.222	0.436	0.598	0.418
17629-002	0.238	0.364	0.288	0.192	0.21	0.32	0.214	0.278
17629-001	0.318	0.266	0.254	0.362	0.212	0.384	0.314	0.3

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.224	0.194	0.2875	0.216	0.242	0.238	0.208	0.23
17629-003	0.35	0.212	0.335	0.26	0.2775	0.545	0.598	0.418
17629-002	0.238	0.364	0.288	0.24	0.21	0.32	0.2675	0.3475
17629-001	0.318	0.4433	0.254	0.4525	0.3533	0.384	0.314	0.3

CETIS Analytical Report

Link/Link Code: 12-8828-8740/17629Ab

Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	03-0969-9106	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:16	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					25.64%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-001	0.4044	1.761	0.096	0.3460	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0019435	0.0019435	1	0.1635	0.6920	Non-Significant Effect
Error	0.1663766	0.0118840	14			
Total	0.1683201	0.0138275	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.84	8.885	0.0967	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9567		0.6031	Normal Distribution

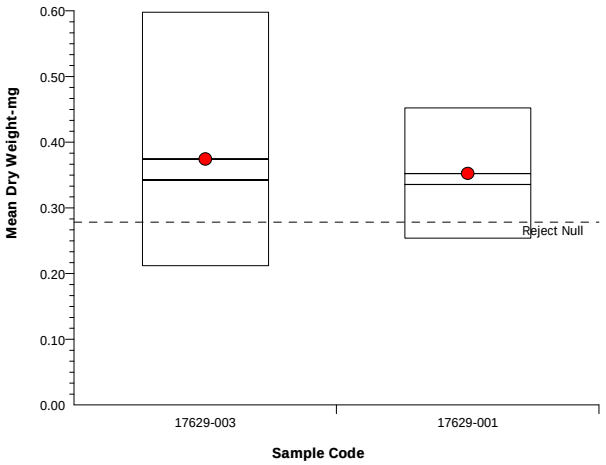
Mean Dry Weight-mg Summary

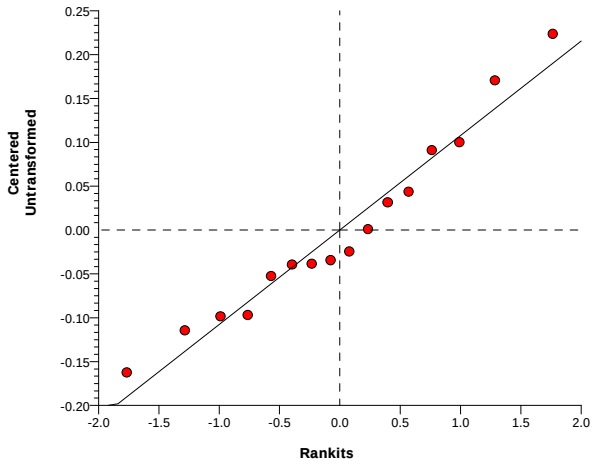
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3744	0.3222	0.4267	0.212	0.598	0.0255	0.1373	36.67%	0.0%
17629-001	8	0.3524	0.3257	0.3791	0.254	0.4525	0.01301	0.07008	19.89%	5.89%

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	0.598	0.545	0.418	0.35	0.335	0.2775	0.26	0.212
17629-001	0.4525	0.4433	0.384	0.3533	0.318	0.314	0.3	0.254

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	05-9215-7737	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:16	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					24.63%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	1.72	1.761	0.09223	0.0537	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.032445	0.032445	1	2.958	0.1075	Non-Significant Effect
Error	0.1535449	0.0109675	14			
Total	0.1859899	0.0434125	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.127	8.885	0.0289	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9598		0.6584	Normal Distribution

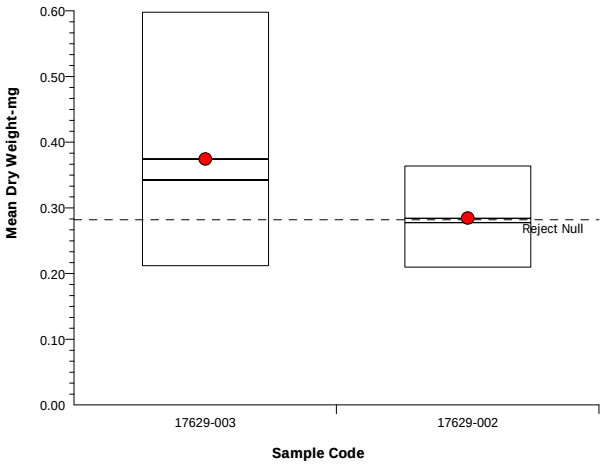
Mean Dry Weight-mg Summary

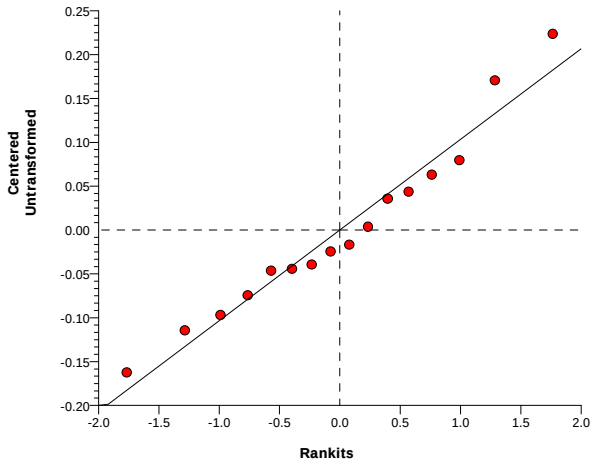
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3744	0.3222	0.4267	0.212	0.598	0.0255	0.1373	36.67%	0.0%
17629-002	8	0.2844	0.2633	0.3055	0.21	0.364	0.0103	0.05548	19.51%	24.05%

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	0.598	0.545	0.418	0.35	0.335	0.2775	0.26	0.212
17629-002	0.364	0.3475	0.32	0.288	0.2675	0.24	0.238	0.21

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	15-7062-5725	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					20.45%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-001	-4.588	1.761	0.04701	0.9998	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.059984	0.059984	1	21.05	0.0004	Significant Effect
Error	0.0399006	0.0028500	14			
Total	0.0998846	0.0628340	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.22	8.885	0.0277	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9584		0.6332	Normal Distribution

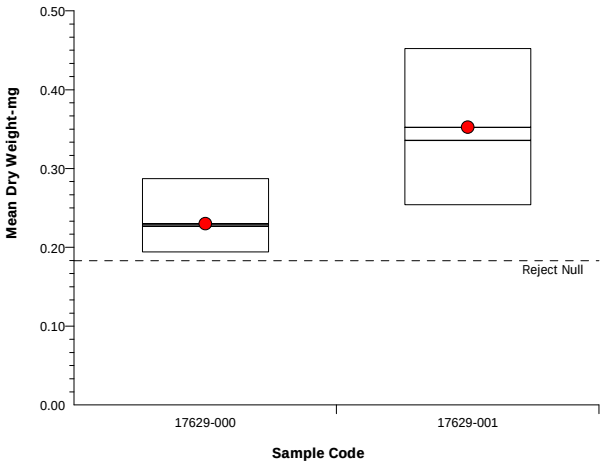
Mean Dry Weight-mg Summary

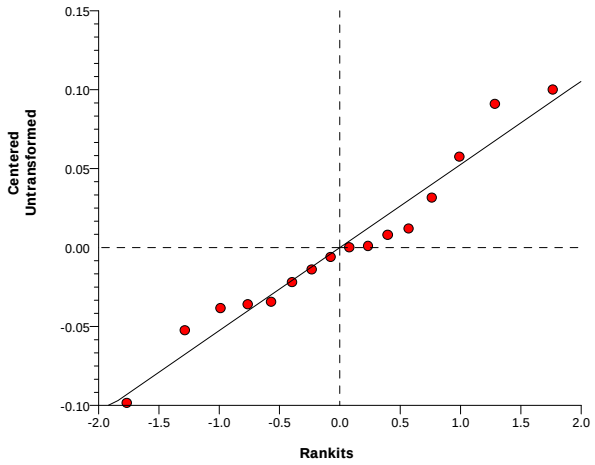
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2192	0.2406	0.194	0.2875	0.005217	0.0281	12.22%	0.0%
17629-001	8	0.3524	0.3257	0.3791	0.254	0.4525	0.01301	0.07008	19.89%	-53.26%

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.2875	0.242	0.238	0.23	0.224	0.216	0.208	0.194
17629-001	0.4525	0.4433	0.384	0.3533	0.318	0.314	0.3	0.254

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	08-6048-2432	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					16.84%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-002	-2.476	1.761	0.03872	0.9867	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0118541	0.0118541	1	6.131	0.0267	Significant Effect
Error	0.0270689	0.0019335	14			
Total	0.038923	0.0137876	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.898	8.885	0.0933	Equal Variances
Distribution	Shapiro-Wilk Normality	0.97		0.8379	Normal Distribution

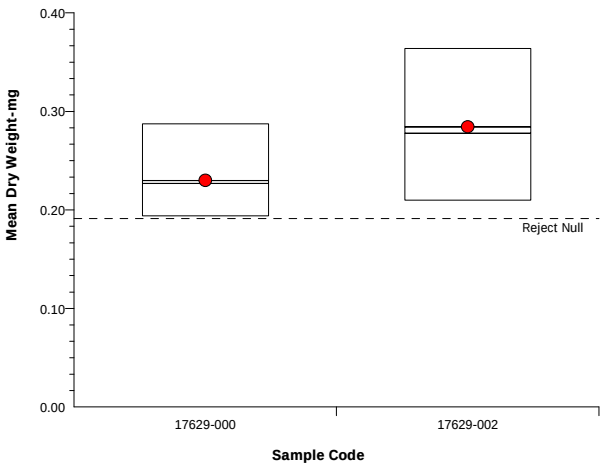
Mean Dry Weight-mg Summary

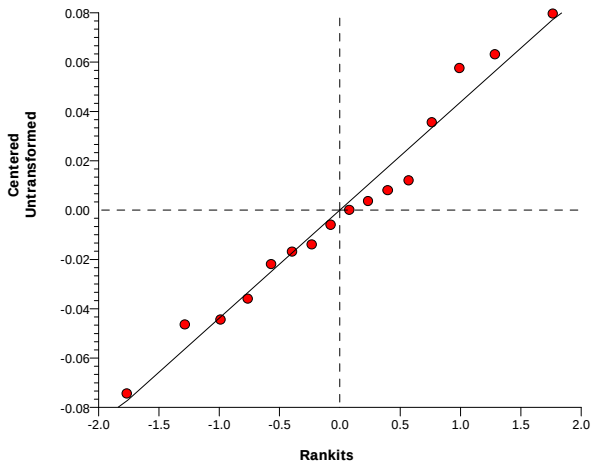
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2192	0.2406	0.194	0.2875	0.005217	0.0281	12.22%	0.0%
17629-002	8	0.2844	0.2633	0.3055	0.21	0.364	0.0103	0.05548	19.51%	-23.68%

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.2875	0.242	0.238	0.23	0.224	0.216	0.208	0.194
17629-002	0.364	0.3475	0.32	0.288	0.2675	0.24	0.238	0.21

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	20-6063-8926	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					37.96%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	-2.916	1.761	0.08728	0.9944	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0835218	0.0835218	1	8.502	0.0113	Significant Effect
Error	0.1375281	0.0098234	14			
Total	0.2210499	0.0933452	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	23.89	8.885	0.0004	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9199		0.1679	Normal Distribution

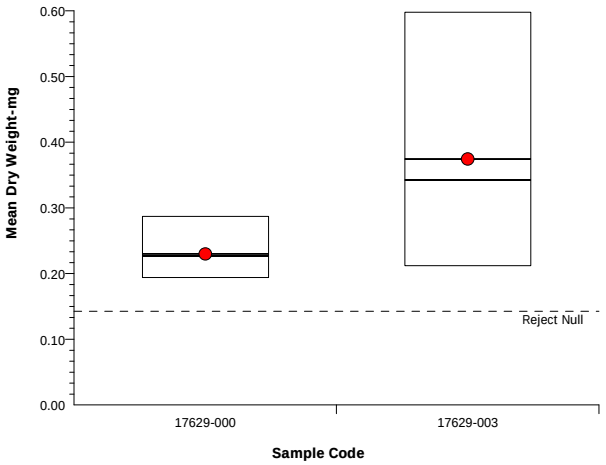
Mean Dry Weight-mg Summary

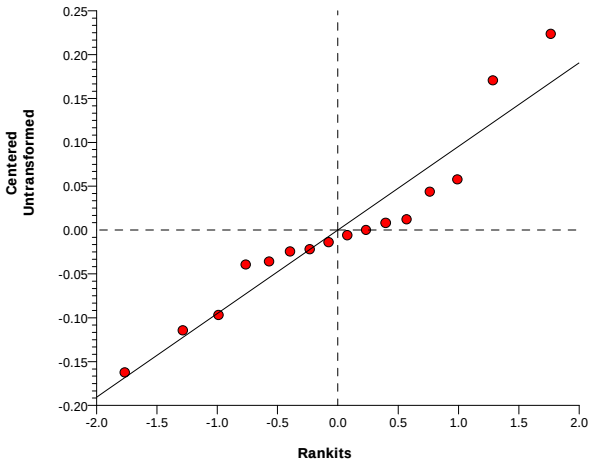
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.2299	0.2192	0.2406	0.194	0.2875	0.005217	0.0281	12.22%	0.0%
17629-003	8	0.3744	0.3222	0.4267	0.212	0.598	0.0255	0.1373	36.67%	-62.84%

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.2875	0.242	0.238	0.23	0.224	0.216	0.208	0.194
17629-003	0.598	0.545	0.418	0.35	0.335	0.2775	0.26	0.212

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	01-1989-7363	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					30.31%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-001	0.3661	1.761	0.09743	0.3599	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0016404	0.0016404	1	0.134	0.7198	Non-Significant Effect
Error	0.1713662	0.0122404	14			
Total	0.1730065	0.0138808	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.642	8.885	0.0231	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8958		0.0688	Normal Distribution

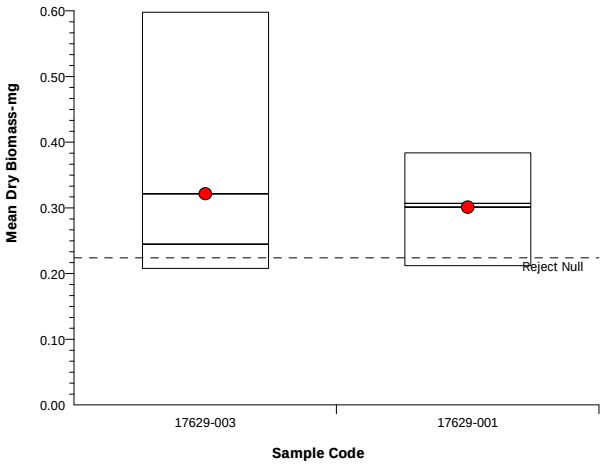
Mean Dry Biomass-mg Summary

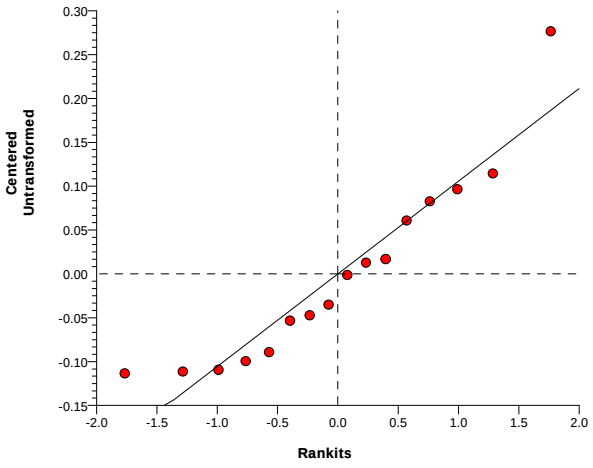
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3215	0.266	0.377	0.208	0.598	0.02709	0.1459	45.37%	0.0%
17629-001	8	0.3012	0.2797	0.3228	0.212	0.384	0.01051	0.0566	18.79%	6.3%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	0.598	0.436	0.418	0.268	0.222	0.212	0.21	0.208
17629-001	0.384	0.362	0.318	0.314	0.3	0.266	0.254	0.212

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	01-0309-5887	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					30.55%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	1.049	1.761	0.09821	0.1559	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.013689	0.013689	1	1.101	0.3119	Non-Significant Effect
Error	0.1741183	0.0124370	14			
Total	0.1878072	0.026126	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.916	8.885	0.0318	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8894		0.0545	Normal Distribution

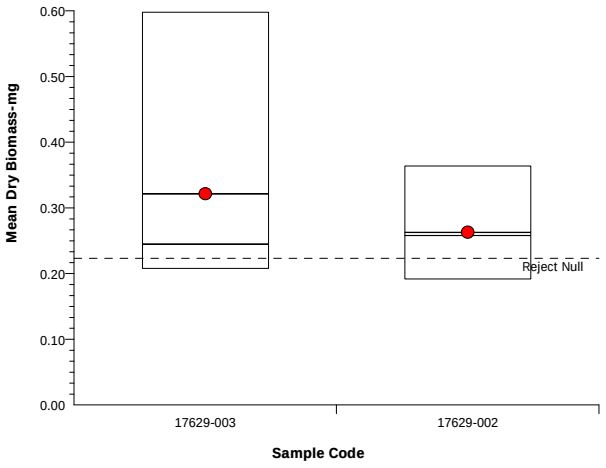
Mean Dry Biomass-mg Summary

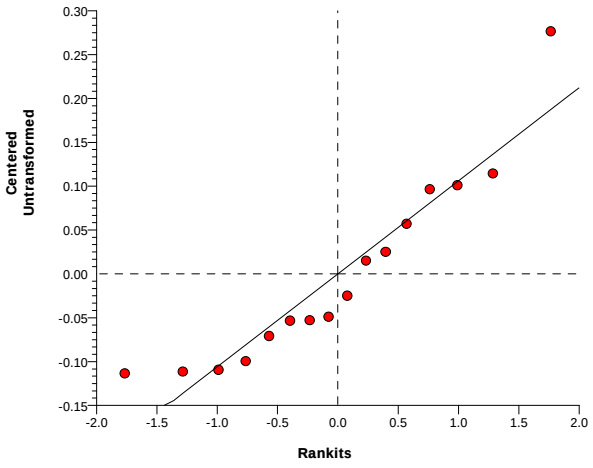
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.3215	0.266	0.377	0.208	0.598	0.02709	0.1459	45.37%	0.0%
17629-002	8	0.263	0.2402	0.2858	0.192	0.364	0.01114	0.05997	22.8%	18.2%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	0.598	0.436	0.418	0.268	0.222	0.212	0.21	0.208
17629-002	0.364	0.32	0.288	0.278	0.238	0.214	0.21	0.192

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	12-1684-2765	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					17.29%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-001	-3.955	1.761	0.03752	0.9993	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0283922	0.0283922	1	15.64	0.0014	Significant Effect
Error	0.0254070	0.0018148	14			
Total	0.0537992	0.030207	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.515	8.885	0.0163	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9717		0.8646	Normal Distribution

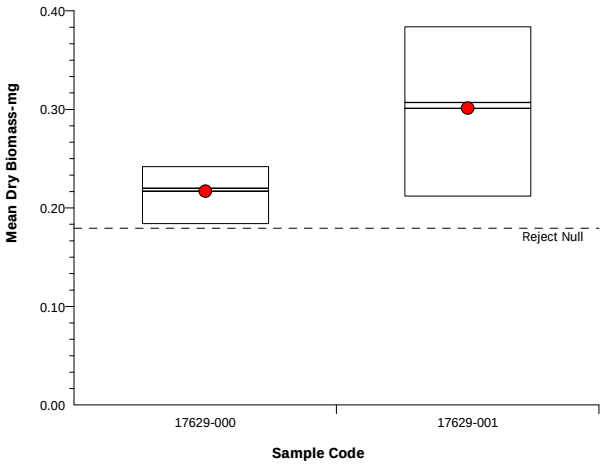
Mean Dry Biomass-mg Summary

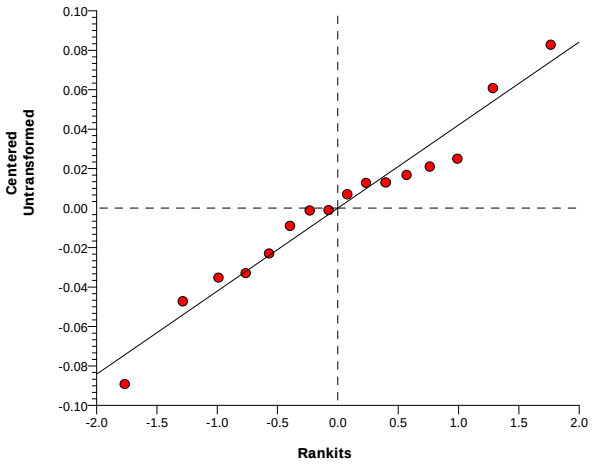
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2091	0.2249	0.184	0.242	0.003834	0.02065	9.51%	0.0%
17629-001	8	0.3012	0.2797	0.3228	0.212	0.384	0.01051	0.0566	18.79%	-38.82%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.242	0.238	0.23	0.224	0.216	0.208	0.194	0.184
17629-001	0.384	0.362	0.318	0.314	0.3	0.266	0.254	0.212

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	06-0667-4011	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					18.2%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-002	-2.051	1.761	0.0395	0.9703	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0084642	0.0084642	1	4.208	0.0594	Non-Significant Effect
Error	0.0281591	0.0020114	14			
Total	0.0366234	0.0104756	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.438	8.885	0.0116	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9669		0.7855	Normal Distribution

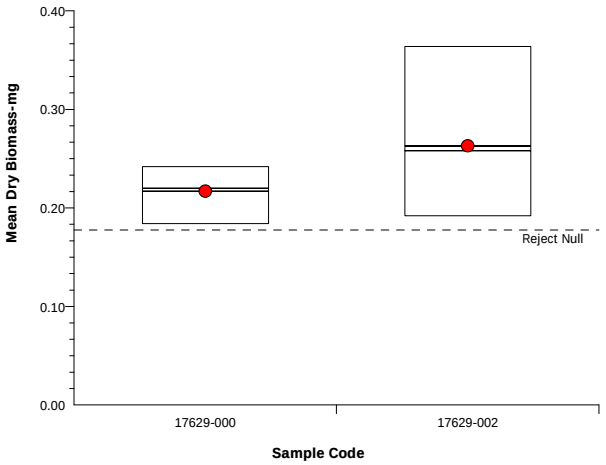
Mean Dry Biomass-mg Summary

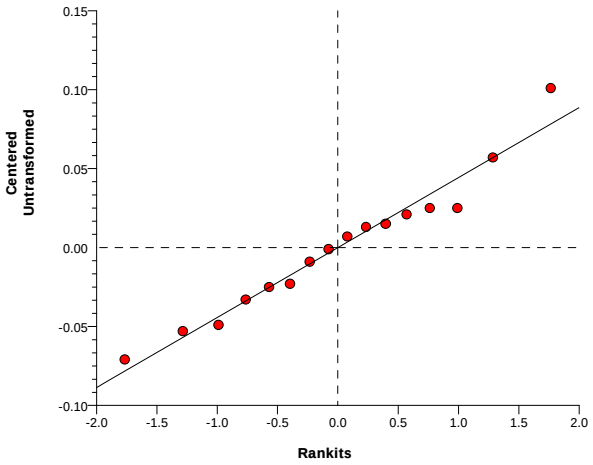
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2091	0.2249	0.184	0.242	0.003834	0.02065	9.51%	0.0%
17629-002	8	0.263	0.2402	0.2858	0.192	0.364	0.01114	0.05997	22.8%	-21.2%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.242	0.238	0.23	0.224	0.216	0.208	0.194	0.184
17629-002	0.364	0.32	0.288	0.278	0.238	0.214	0.21	0.192

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	12-3514-5195	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.6.4
Analyzed:	02 Sep-08 11:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					42.28%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	-2.006	1.761	0.09174	0.9677	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0436815	0.0436815	1	4.025	0.0645	Non-Significant Effect
Error	0.1519266	0.0108519	14			
Total	0.1956081	0.0545334	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	49.92	8.885	0.0000	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8766		0.0343	Normal Distribution

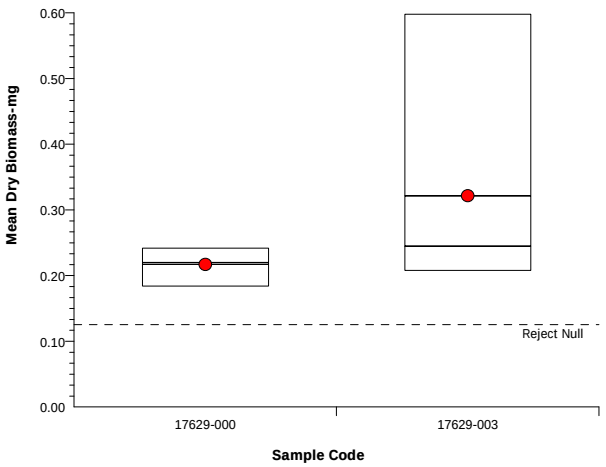
Mean Dry Biomass-mg Summary

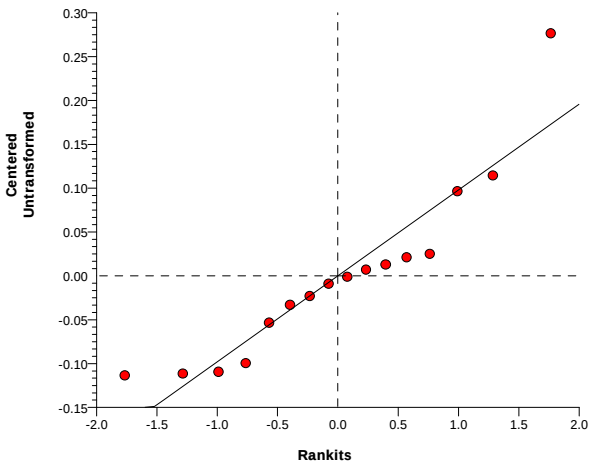
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.217	0.2091	0.2249	0.184	0.242	0.003834	0.02065	9.51%	0.0%
17629-003	8	0.3215	0.266	0.377	0.208	0.598	0.02709	0.1459	45.37%	-48.16%

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	0.242	0.238	0.23	0.224	0.216	0.208	0.194	0.184
17629-003	0.598	0.436	0.418	0.268	0.222	0.212	0.21	0.208

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	14-9000-0868	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					16.44%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-003		17629-001	72.5		3	0.7292	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0040703	0.0040703	1	0.114	0.7406	Non-Significant Effect
Error	0.4998225	0.0357016	14			
Total	0.5038928	0.0397719	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.651	8.885	0.5244	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8161		0.0045	Non-normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.85	0.7962	0.9038	0.6	1	0.02626	0.1414	16.64%	0.0%
17629-001	8	0.875	0.8053	0.9447	0.6	1	0.03402	0.1832	20.94%	-2.94%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.169	1.106	1.231	0.8861	1.345	0.03048	0.1641	14.04%	0.0%
17629-001	8	1.201	1.121	1.281	0.8861	1.345	0.03916	0.2109	17.56%	-2.73%

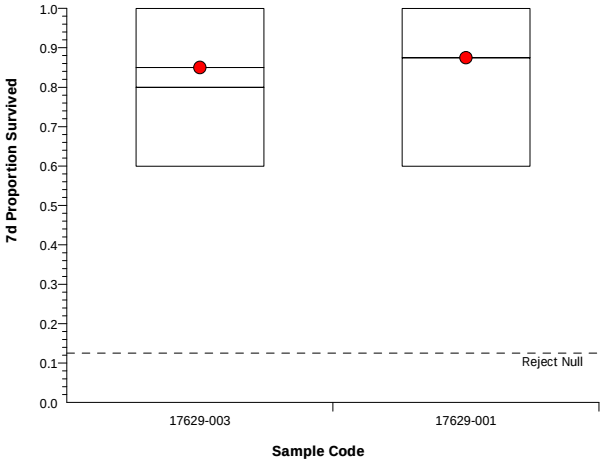
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

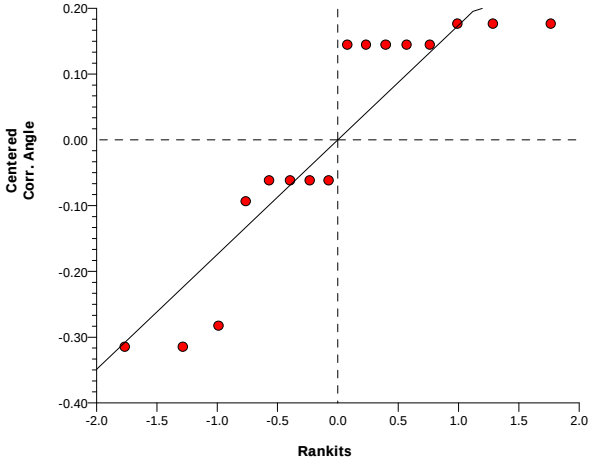
Analysis No:	14-9000-0868	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	1	1	1	0.8	0.8	0.8	0.8	0.6
17629-001	1	1	1	1	1	0.8	0.6	0.6

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	18-1670-2733	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					12.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-003		17629-002	-1.201	1.761	0.1278	0.8752	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0303927	0.0303927	1	1.443	0.2496	Non-Significant Effect
Error	0.2949017	0.0210644	14			
Total	0.3252944	0.0514571	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.774	8.885	0.4674	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9039		0.0929	Normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.85	0.7962	0.9038	0.6	1	0.02626	0.1414	16.64%	0.0%
17629-002	8	0.925	0.8856	0.9644	0.8	1	0.01922	0.1035	11.19%	-8.82%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.169	1.106	1.231	0.8861	1.345	0.03048	0.1641	14.04%	0.0%
17629-002	8	1.256	1.209	1.303	1.107	1.345	0.02289	0.1232	9.81%	-7.46%

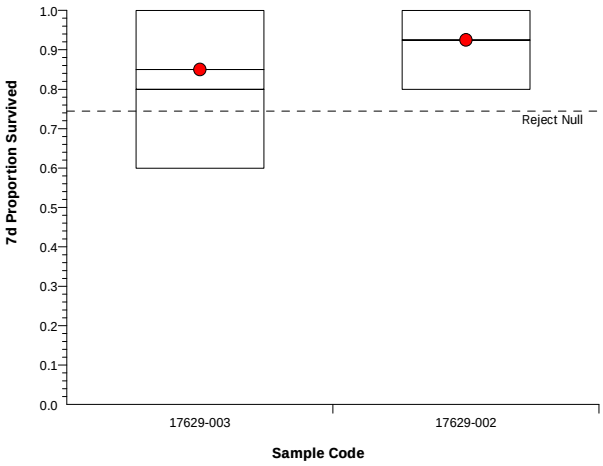
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

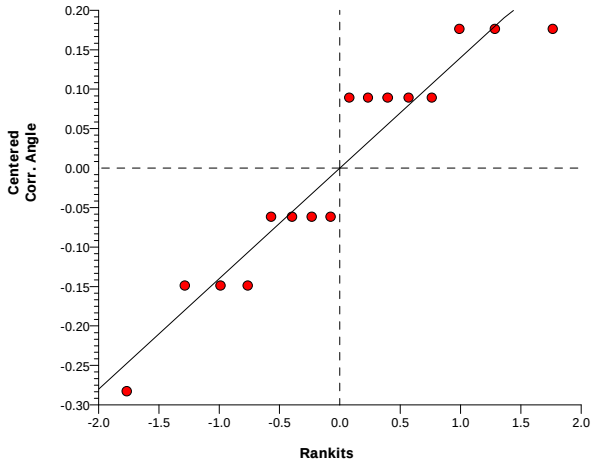
Analysis No:	18-1670-2733	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	1	1	1	0.8	0.8	0.8	0.8	0.6
17629-002	1	1	1	1	1	0.8	0.8	0.8

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	20-9815-6064	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					13.29%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-001	62		2	0.2538	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0289236	0.0289236	1	1.022	0.3293	Non-Significant Effect
Error	0.3963099	0.0283079	14			
Total	0.4252335	0.0572314	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.659	8.885	0.1085	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7966		0.0025	Non-normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9148	0.9852	0.8	1	0.01719	0.09258	9.75%	0.0%
17629-001	8	0.875	0.8053	0.9447	0.6	1	0.03402	0.1832	20.94%	7.9%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.286	1.244	1.328	1.107	1.345	0.02047	0.1102	8.57%	0.0%
17629-001	8	1.201	1.121	1.281	0.8861	1.345	0.03916	0.2109	17.56%	6.61%

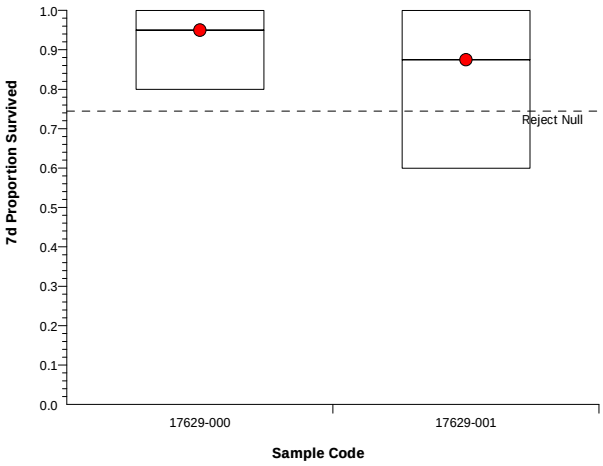
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

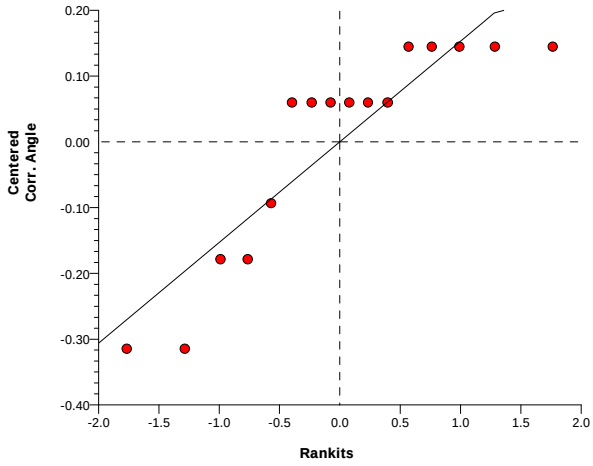
Analysis No:	20-9815-6064	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	0.8	0.8
17629-001	1	1	1	1	1	0.8	0.6	0.6

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	01-1164-5507	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					9.8%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-002	64		2	0.4992	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	0.2593	0.6186	Non-Significant Effect
Error	0.1913892	0.0136707	14			
Total	0.1949334	0.0172149	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.25	8.885	0.7760	Equal Variances
Distribution	Shapiro-Wilk Normality	0.6932		0.0001	Non-normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9148	0.9852	0.8	1	0.01719	0.09258	9.75%	0.0%
17629-002	8	0.925	0.8856	0.9644	0.8	1	0.01922	0.1035	11.19%	2.63%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.286	1.244	1.328	1.107	1.345	0.02047	0.1102	8.57%	0.0%
17629-002	8	1.256	1.209	1.303	1.107	1.345	0.02289	0.1232	9.81%	2.32%

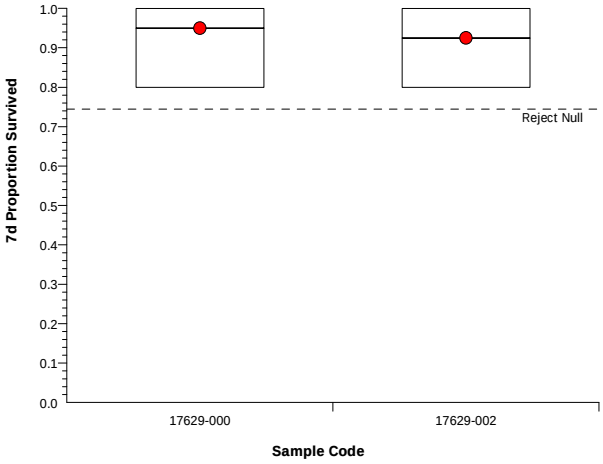
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

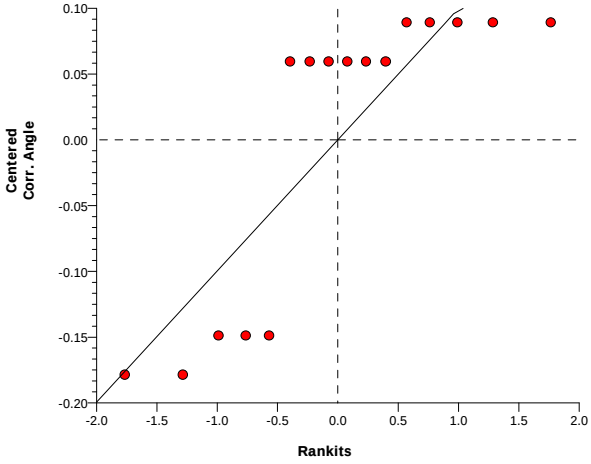
Analysis No:	01-1164-5507	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	0.8	0.8
17629-002	1	1	1	1	1	0.8	0.8	0.8

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	12-8117-9100	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					11.32%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	1.673	1.761	0.1231	0.0583	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0546945	0.0546945	1	2.798	0.1166	Non-Significant Effect
Error	0.2736363	0.0195455	14			
Total	0.3283308	0.07424	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.217	8.885	0.3154	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9095		0.1144	Normal Distribution

7d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.95	0.9148	0.9852	0.8	1	0.01719	0.09258	9.75%	0.0%
17629-003	8	0.85	0.7962	0.9038	0.6	1	0.02626	0.1414	16.64%	10.53%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.286	1.244	1.328	1.107	1.345	0.02047	0.1102	8.57%	0.0%
17629-003	8	1.169	1.106	1.231	0.8861	1.345	0.03048	0.1641	14.04%	9.09%

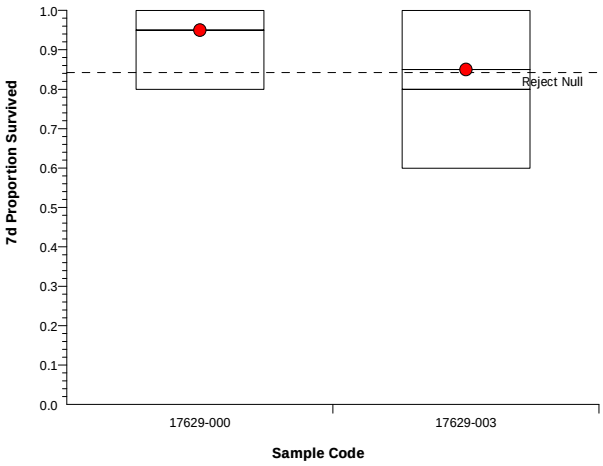
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

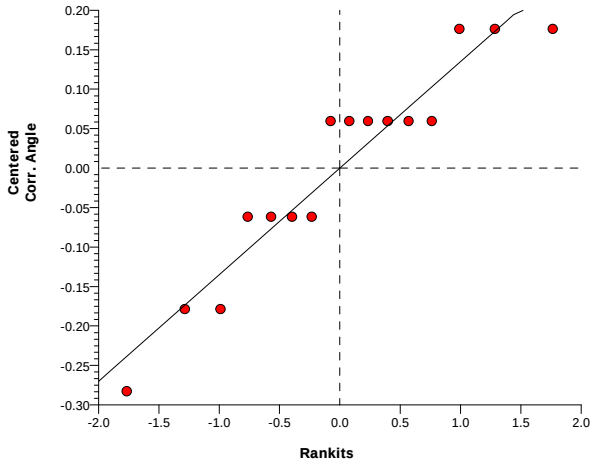
Analysis No:	12-8117-9100	**Endpoint:**	7d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

7d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	0.8	0.8
17629-003	1	1	1	0.8	0.8	0.8	0.8	0.6

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	00-2491-7286	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					7.43%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-003		17629-001	88		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0886061	0.0886061	1	11.67	0.0042	Significant Effect
Error	0.1063273	0.0075948	14			
Total	0.1949334	0.0962009	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	4.2	8.862	0.0597	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7854		0.0018	Non-normal Distribution

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.875	0.8356	0.9144	0.8	1	0.01922	0.1035	11.83%	0.0%
17629-001	8	1	1	1	1	1	0	0	0.0%	-14.29%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.196	1.15	1.243	1.107	1.345	0.02289	0.1232	10.3%	0.0%
17629-001	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-12.44%

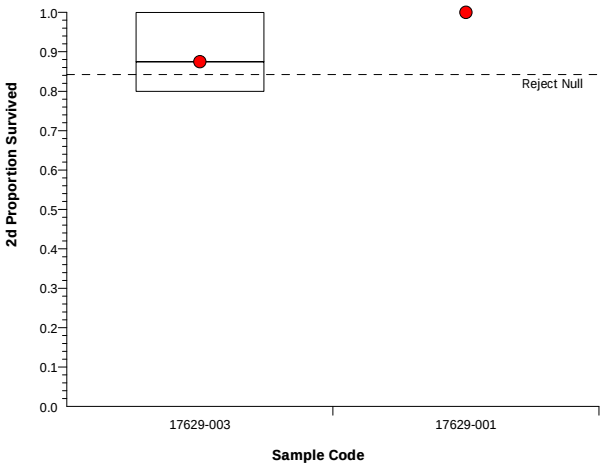
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

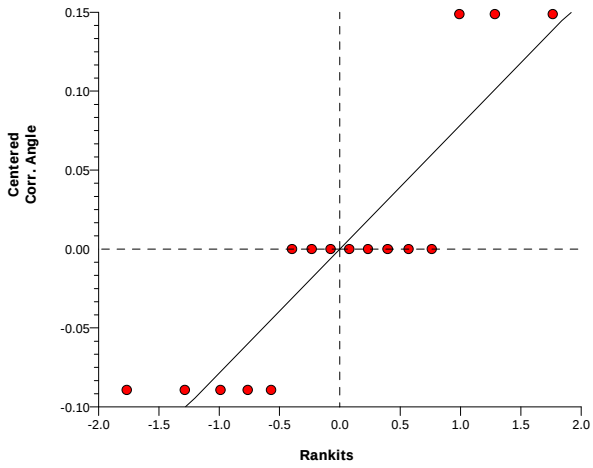
Analysis No:	00-2491-7286	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	1	1	1	0.8	0.8	0.8	0.8	0.8
17629-001	1	1	1	1	1	1	1	1

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	02-1154-2686	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					7.43%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-003		17629-002	88		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0886061	0.0886061	1	11.67	0.0042	Significant Effect
Error	0.1063273	0.0075948	14			
Total	0.1949334	0.0962009	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	4.2	8.862	0.0597	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7854		0.0018	Non-normal Distribution

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	0.875	0.8356	0.9144	0.8	1	0.01922	0.1035	11.83%	0.0%
17629-002	8	1	1	1	1	1	0	0	0.0%	-14.29%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-003	8	1.196	1.15	1.243	1.107	1.345	0.02289	0.1232	10.3%	0.0%
17629-002	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-12.44%

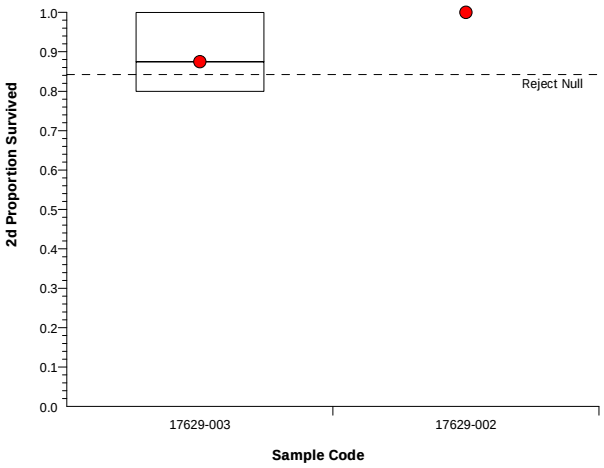
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

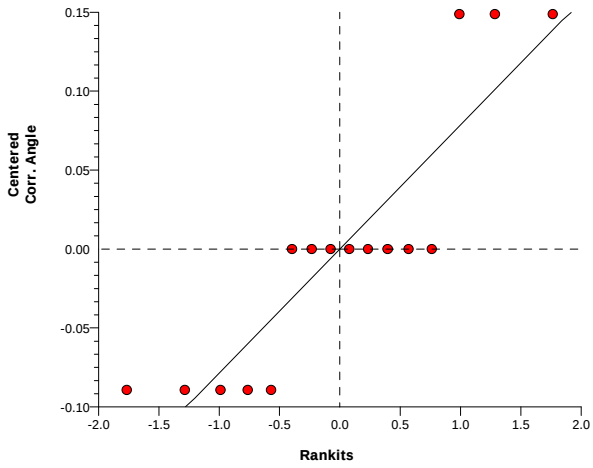
Analysis No:	02-1154-2686	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-003	1	1	1	0.8	0.8	0.8	0.8	0.8
17629-002	1	1	1	1	1	1	1	1

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	09-5397-8859	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					6.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-001	72		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
17629-001	8	1	1	1	1	1	0	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
17629-001	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-2.26%

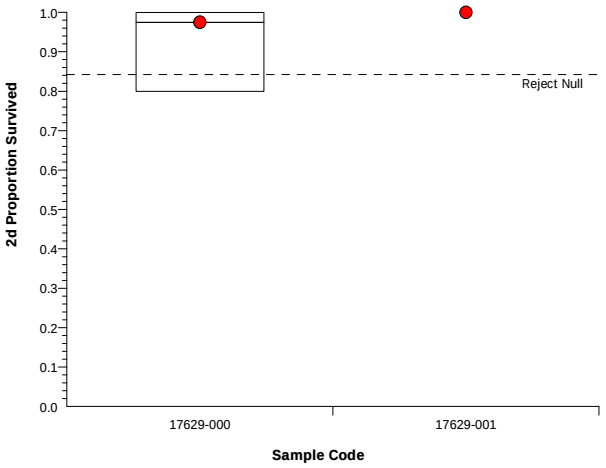
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

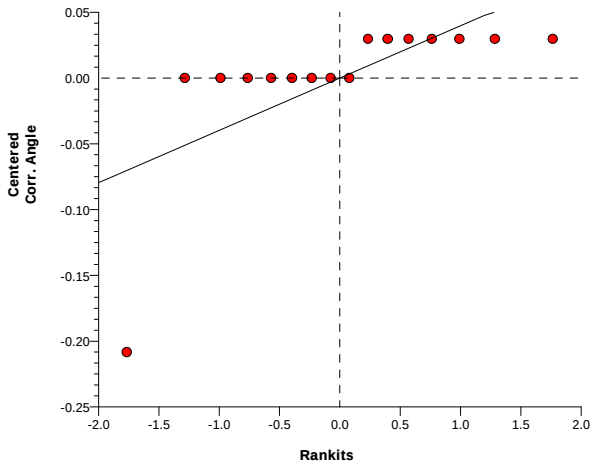
Analysis No:	09-5397-8859	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	1	0.8
17629-001	1	1	1	1	1	1	1	1

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	18-2611-3572	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	10000 Trial					6.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
17629-000		17629-002	72		1	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0035442	0.0035442	1	1	0.3343	Non-Significant Effect
Error	0.0496194	0.0035442	14			
Total	0.0531637	0.0070885	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	8.862	0.3343	Equal Variances
Distribution	Shapiro-Wilk Normality	0.4689		0.0000	Non-normal Distribution

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
17629-002	8	1	1	1	1	1	0	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
17629-002	8	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	-2.26%

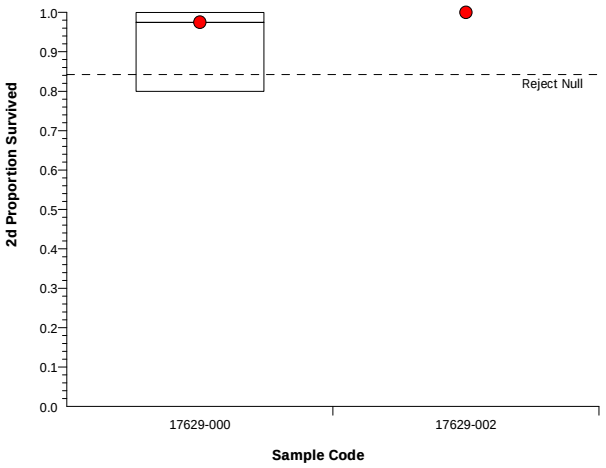
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

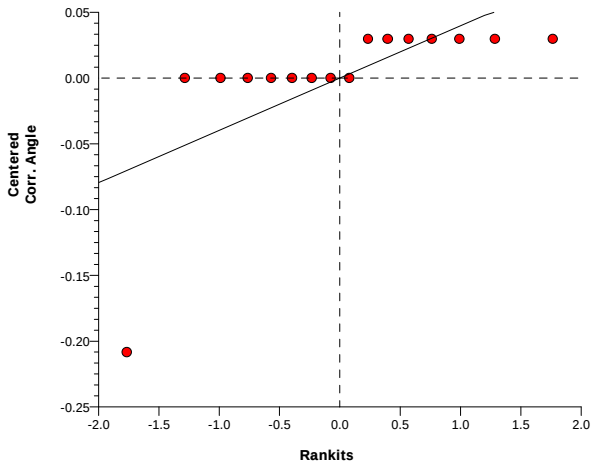
Analysis No:	18-2611-3572	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	1	0.8
17629-002	1	1	1	1	1	1	1	1

Graphics





Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

Analysis No:	20-8833-8706	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	05-6477-7504	**Test Type:**	Growth-Survival-Fec (7d)	**Analyst:**	
Start Date:	22 Aug-08 13:05	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Aug-08 15:55	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample Comments
17629-003	0.2 - 0.3 NTU.
17629-002	14-20 NTU.
17629-001	25-32 NTU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					9.38%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17629-000		17629-003	2.256	1.761	0.09295	0.0203	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0567079	0.0567079	1	5.091	0.0406	Significant Effect
Error	0.1559467	0.0111391	14			
Total	0.2126546	0.067847	15			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.143	8.885	0.3361	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8838		0.0445	Normal Distribution

2d Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	0.975	0.9481	1	0.8	1	0.01313	0.07071	7.25%	0.0%
17629-003	8	0.875	0.8356	0.9144	0.8	1	0.01922	0.1035	11.83%	10.26%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17629-000	8	1.316	1.283	1.348	1.107	1.345	0.01563	0.08419	6.4%	0.0%
17629-003	8	1.196	1.15	1.243	1.107	1.345	0.02289	0.1232	10.3%	9.05%

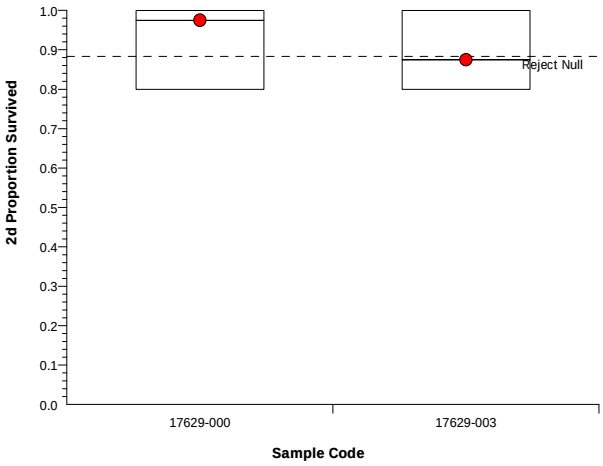
Americamysis 7-d Survival, Growth and Fecundity Test — **EnviroSystems, Inc.**

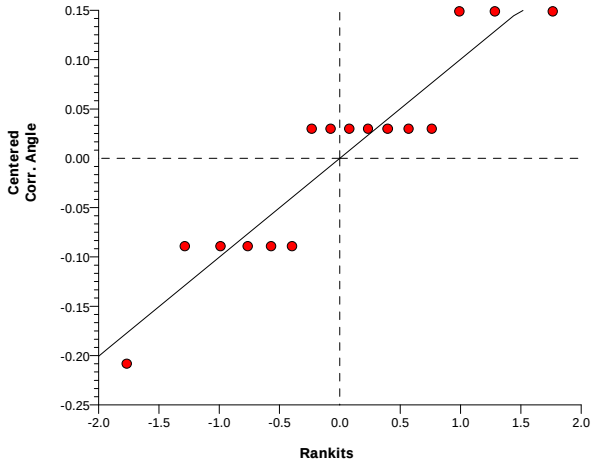
Analysis No:	20-8833-8706	**Endpoint:**	2d Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	29 Aug-08 17:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

2d Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
17629-000	1	1	1	1	1	1	1	0.8
17629-003	1	1	1	0.8	0.8	0.8	0.8	0.8

Graphics





Arbacia punctulata Chronic Fertilization Assay
Water Quality and Gamete Preparation Data

STUDY: 17699	CLIENT: BATTELLE	LOCATION: New Bedford	DATE: 10/2/08 INITIALS: LB

SALINITY ADJUSTMENT RECORD: 1000 mL -001 + 11 g SALT

SALINITY ADJUSTMENT RECORD: 1000 mL -002 + 11 g SALT

SALINITY ADJUSTMENT RECORD: 1000 mL -003 + 24 g SALT

~~SALINITY ADJUSTMENT RECORD: _____ mL -004 + _____ g SALT~~

SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	~~25~~ 7.2 7.1	~~7.92~~ 8.19	~~39200~~ 43800	~~4~~ 21 24	~~25~~ 28
-001	~~9.2~~ 7.2	~~7.13~~ 7.84	~~32400~~ 44370	4 21	~~20.7~~ 29
-002	~~7.7~~ 7.1	~~7.47~~ 7.91	~~31550~~ 45140	4 21	~~20.4~~ 29
-003	~~9.4~~ 7.2	~~6.80~~ 7.95	~~14930~~ 44410	4 21	~~9.0~~ 29
~~-004~~					

METERS USED

DO meter # 3 DO probe # 82 pH meter # 1097 pH probe # 83 S/C meter # YS130C S/C probe # YS130C

SALINITY meter # YS130C

DATE & INITIALS FOR GAMETE PREPARATION: ~~137~~ 10/2/08 LB

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: ~~1.37~~ 137 X 10^4 = SPM SOLUTION E = 1.37×10^6

SPERM CONCENTRATIONS:
SOLUTION E X 40 = SOLUTION A = 5.48×10^7 SPM
SOLUTION E X 20 = SOLUTION B = 2.74×10^7 SPM
SOLUTION E X 5 = SOLUTION C = 6.85×10^6 SPM

FINAL COUNTS:

FINAL SPERM COUNT: 1.37×10^6
FINAL EGG COUNT: 2000

TEST TIMES:

SPERM COLLECTED: 1515
EGGS COLLECTED: 1600
SPERM ADDED: 1525
EGGS ADDED: 1625
FIXATIVE ADDED: 1645

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 17699	CLIENT: Battelle - New Bedford
SPECIES: *A. punctulata*	

	Day: 0	
SAMPLE	Volume Used (mL)	ESI Cube ID
Lab Control	100	~~002~~ 17778
-001	100	001
-002	100	002
-003	100	003
~~-004~~		
INITIALS:	UB	
TIME:	1450	
DATE:	10/2/08	

FERTILIZATION COUNTS

STUDY	CLIENT BATTELLE	LOCATION New Bedford	DATE 10/3/08 INITIALS SJ

	REPLICATE VIAL			
	1	2	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100/101	100/103	100/100	101/102
-001	101/106	104/111	100/108	100/109
-002	90/112	96/110	92/107	90/110
-003	105/111	102/108	100/103	100/104
~~-004~~				

CETIS Summary Report

Report Date: 03 Oct-08 13:05 (p 1 of 1)
Link/Link Code: 14-5978-8516

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Test Run No:	19-1583-5511	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	02 Oct-08 15:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Oct-08 16:45	**Species:**	Arbacia punctulata	**Brine:**	Not Applicable
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
17699-000	17-1203-2644	02 Oct-08 16:00	02 Oct-08 16:00	N/A	Battelle Labs	Ecological Risk Assessme
17699-003 Ref	01-0238-7777	01 Oct-08 12:15	01 Oct-08 16:30	27h		
17699-002	01-5675-2759	01 Oct-08 11:50	01 Oct-08 16:30	28h		
17699-001	01-3219-1912	01 Oct-08 11:23	01 Oct-08 16:30	28h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
17699-000	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-Lab Control		
17699-003 Ref	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-003		
17699-002	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-002		
17699-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001		

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
09-8209-7467	Proportion Fertilized	Control Resp	0.9878	0.7 - 1	Yes	Passes acceptability criteria
13-8798-2870	Proportion Fertilized	Control Resp	0.9878	0.7 - 1	Yes	Passes acceptability criteria
17-2081-3871	Proportion Fertilized	Control Resp	0.9878	0.7 - 1	Yes	Passes acceptability criteria
08-6652-4166	Proportion Fertilized	PMSD	0.03026	NL - 0.25	No	Passes acceptability criteria
09-8209-7467	Proportion Fertilized	PMSD	0.01413	NL - 0.25	No	Passes acceptability criteria
13-8798-2870	Proportion Fertilized	PMSD	0.01419	NL - 0.25	No	Passes acceptability criteria
17-2081-3871	Proportion Fertilized	PMSD	0.01677	NL - 0.25	No	Passes acceptability criteria
18-9923-5252	Proportion Fertilized	PMSD	0.02414	NL - 0.25	No	Passes acceptability criteria

Proportion Fertilized Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	0.9878	0.9832	0.9923	0.9709	1	0.002227	0.0122	1.24%	0.0%
17699-003 Ref	4	0.9333	0.9276	0.939	0.9174	0.9528	0.002791	0.01528	1.64%	5.52%
17699-002	4	0.8386	0.8263	0.8509	0.8036	0.8727	0.006017	0.03296	3.93%	15.11%
17699-001	4	0.9557	0.9509	0.9605	0.9444	0.9709	0.002324	0.01273	1.33%	3.25%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17699-000	0.9901	0.9709	1	0.9902
17699-003 Ref	0.9528	0.9369	0.9259	0.9174
17699-002	0.8036	0.8727	0.8598	0.8182
17699-001	0.9459	0.9444	0.9709	0.9615

CETIS Analytical Report

Link/Link Code: 14-5978-8516

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	18-9923-5252	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	03 Oct-08 13:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	19-1583-5511	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	02 Oct-08 15:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Oct-08 16:45	**Species:**	Arbacia punctulata	**Brine:**	Not Applicable
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.41%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-003 Ref		17699-001	-2.22	1.943	0.0434	0.9659	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0049197	0.0049197	1	4.93	0.0682	Non-Significant Effect
Error	0.0059871	0.0009978	6			
Total	0.0109068	0.0059176	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.023	47.47	0.9852	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8816		0.1950	Normal Distribution

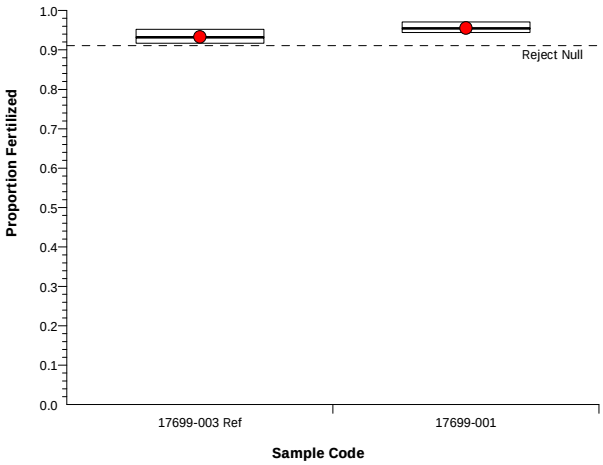
Proportion Fertilized Summary

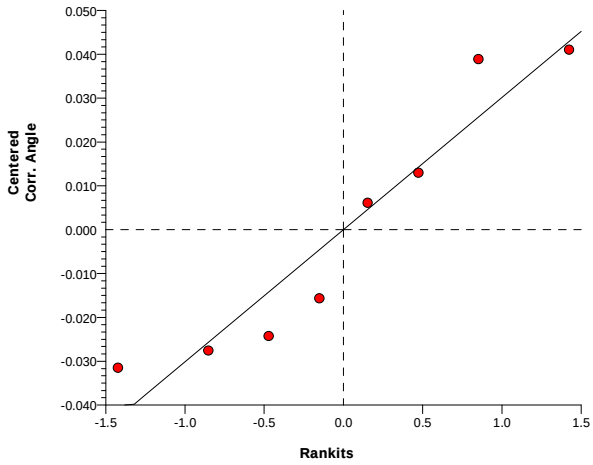
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-003 Ref	4	0.9333	0.9275	0.9391	0.9174	0.9528	0.002838	0.01528	1.64%	0.0%
17699-001	4	0.9557	0.9509	0.9605	0.9444	0.9709	0.002364	0.01273	1.33%	-2.4%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-003 Ref	4	1.311	1.299	1.323	1.279	1.352	0.005832	0.03141	2.4%	0.0%
17699-001	4	1.36	1.348	1.373	1.333	1.399	0.0059	0.03177	2.34%	-3.78%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	08-6652-4166	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	03 Oct-08 13:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	19-1583-5511	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	02 Oct-08 15:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Oct-08 16:45	**Species:**	Arbacia punctulata	**Brine:**	Not Applicable
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					3.03%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-003 Ref		17699-002	5.547	1.943	0.05328	0.0007	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0462633	0.0462633	1	30.77	0.0015	Significant Effect
Error	0.0090225	0.0015037	6			
Total	0.0552858	0.0477670	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.049	47.47	0.5707	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9221		0.4473	Normal Distribution

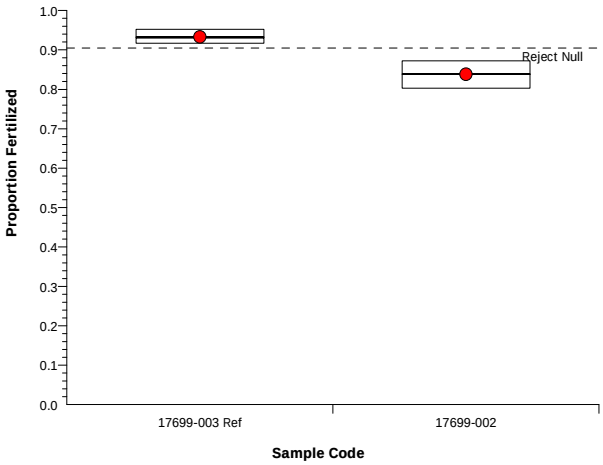
Proportion Fertilized Summary

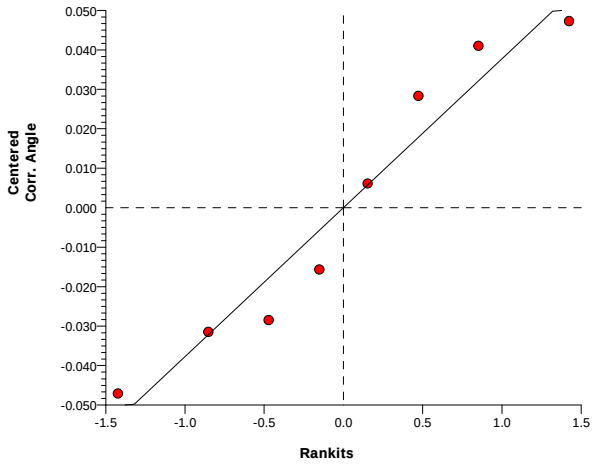
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-003 Ref	4	0.9333	0.9275	0.9391	0.9174	0.9528	0.002838	0.01528	1.64%	0.0%
17699-002	4	0.8386	0.826	0.8511	0.8036	0.8727	0.00612	0.03296	3.93%	10.15%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-003 Ref	4	1.311	1.299	1.323	1.279	1.352	0.005832	0.03141	2.4%	0.0%
17699-002	4	1.159	1.142	1.176	1.112	1.206	0.008348	0.04496	3.88%	11.6%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	13-8798-2870	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	03 Oct-08 13:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	19-1583-5511	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	02 Oct-08 15:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Oct-08 16:45	**Species:**	Arbacia punctulata	**Brine:**	Not Applicable
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.42%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-000		17699-001	3.553	1.943	0.05758	0.0060	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.022167	0.022167	1	12.62	0.0120	Significant Effect
Error	0.010536	0.001756	6			
Total	0.032703	0.023923	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.479	47.47	0.4755	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9695		0.8943	Normal Distribution

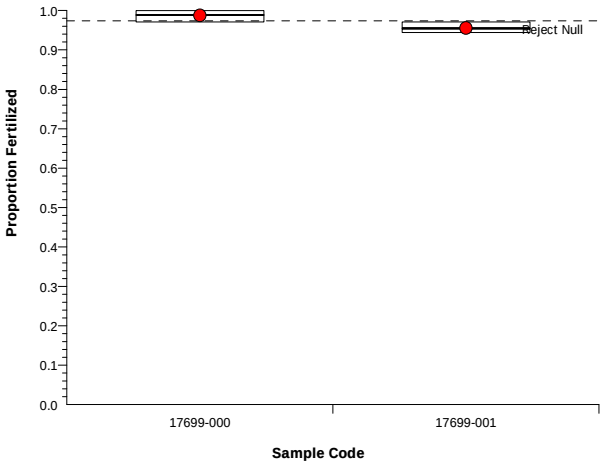
Proportion Fertilized Summary

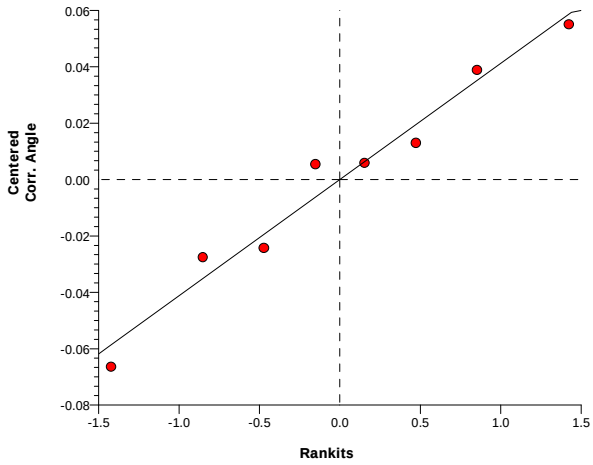
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	0.9878	0.9832	0.9924	0.9709	1	0.002265	0.0122	1.24%	0.0%
17699-001	4	0.9557	0.9509	0.9605	0.9444	0.9709	0.002364	0.01273	1.33%	3.25%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	1.466	1.447	1.485	1.399	1.521	0.009289	0.05003	3.41%	0.0%
17699-001	4	1.36	1.348	1.373	1.333	1.399	0.0059	0.03177	2.34%	7.18%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	17-2081-3871	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	03 Oct-08 13:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	19-1583-5511	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	02 Oct-08 15:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Oct-08 16:45	**Species:**	Arbacia punctulata	**Brine:**	Not Applicable
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.68%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-000		17699-002	9.128	1.943	0.06535	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1884564	0.1884564	1	83.32	0.0001	Significant Effect
Error	0.0135714	0.0022619	6			
Total	0.2020278	0.1907183	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.238	47.47	0.8648	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9462		0.6732	Normal Distribution

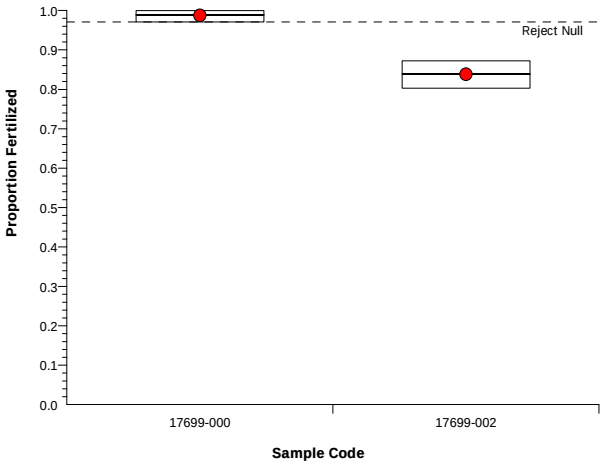
Proportion Fertilized Summary

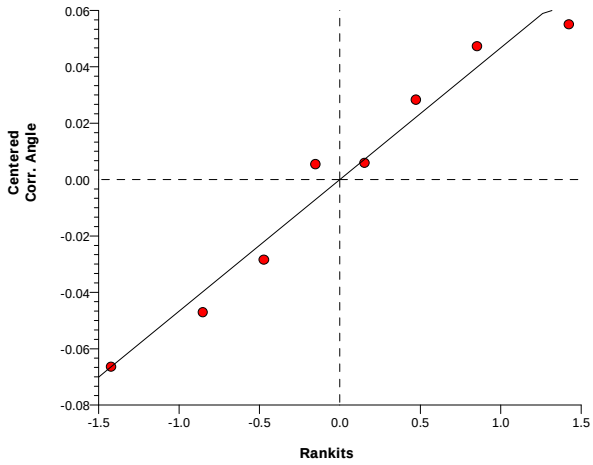
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	0.9878	0.9832	0.9924	0.9709	1	0.002265	0.0122	1.24%	0.0%
17699-002	4	0.8386	0.826	0.8511	0.8036	0.8727	0.00612	0.03296	3.93%	15.11%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	1.466	1.447	1.485	1.399	1.521	0.009289	0.05003	3.41%	0.0%
17699-002	4	1.159	1.142	1.176	1.112	1.206	0.008348	0.04496	3.88%	20.94%

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis No:	09-8209-7467	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	03 Oct-08 13:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	19-1583-5511	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	02 Oct-08 15:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	02 Oct-08 16:45	**Species:**	Arbacia punctulata	**Brine:**	Not Applicable
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.41%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-000		17699-003 Ref	5.244	1.943	0.05739	0.0010	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0479727	0.0479727	1	27.5	0.0019	Significant Effect
Error	0.0104666	0.0017444	6			
Total	0.0584392	0.0497171	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.537	47.47	0.4646	Equal Variances
Distribution	Shapiro-Wilk Normality	0.961		0.8193	Normal Distribution

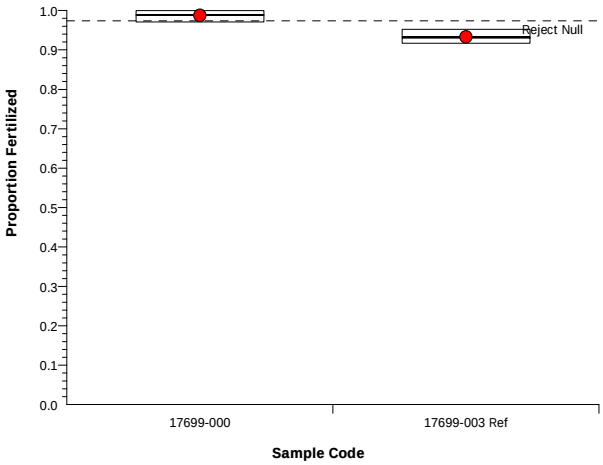
Proportion Fertilized Summary

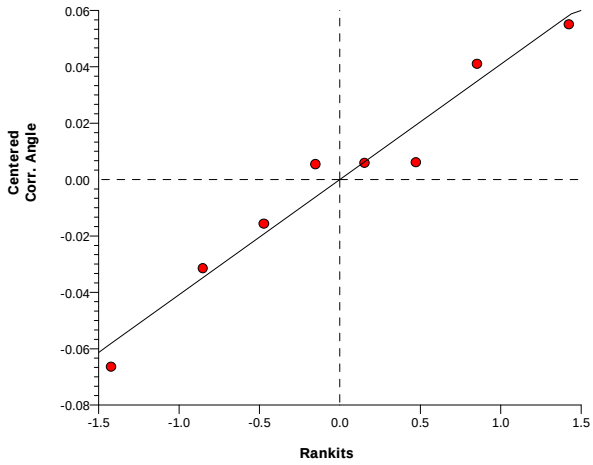
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	0.9878	0.9832	0.9924	0.9709	1	0.002265	0.0122	1.24%	0.0%
17699-003 Ref	4	0.9333	0.9275	0.9391	0.9174	0.9528	0.002838	0.01528	1.64%	5.52%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	1.466	1.447	1.485	1.399	1.521	0.009289	0.05003	3.41%	0.0%
17699-003 Ref	4	1.311	1.299	1.323	1.279	1.352	0.005832	0.03141	2.4%	10.57%

Graphics





Saskatchewan Research Council
15 Innovation Boulevard, Saskatoon, SK S7N 2X8
Phone: 306-933-5469

Champia parvula Sexual Reproduction Test Quality Assurance Summary

Client	ESI Ltd		
SRC Publication No.	11020-14C08	Test Initiation Date	Oct 2/08
Analyst	M. Moody, D. Bolin	Test Completion Date	Oct 9/08
Sample Identification/Name	WQ-TOX-001, WQ-TOX-002, WQ-TOX-003		

This report is based on the Environment Canada Guidance Document: Report Assessment Checklist for the Pulp and Paper and Metal Mining EEM Programs, April 2005.

Test Organisms, Method and Conditions - Species: *Champia parvula,* sexually mature male and female branches, in good health, males having sori with spermatia, females having trichogynes. Method: EPA 821-R-02-014, Method 1009.0 (Third edition, October 2002), static, non-renewal; 2-day effluent exposure followed by 5 to 7 day recovery period in control medium for cystocarp development. Exposure/Dilution Medium: natural seawater collected at Pacific Environmental Science Centre, Environment Canada, North Vancouver, B.C., filtered to 1 µm and autoclaved before use, adjusted as necessary to salinity 30 ppt. with brine* at 90 ppt prepared from commercial see salts (Instant Ocean). Natural seawater is enriched with 10 ml/L Test Nutrient Solution. Recovery Medium: natural seawater as above, enriched with 10 ml/L Culture Nutrient Solution (method section 16.10.1.3).

Reference Toxicant Test - Method: EPA/600/4-91/003, Method 1009.0, static, non-renewal; 2-day toxicant exposure followed by 5 to 7 day recovery period in control medium for cystocarp development. Test conditions: performed under same experimental conditions as effluent sample. Compound: sodium dodecyl sulphate mg/L

Date of test: Oct 10/08		Historic value, warning limits ±2SD
IC_{50} (95 % CL) mg/L	1.05 (0.83 – 1.26)	1.25 (1.05 – 1.48)

Quality Control Data - There was no unusual appearance or treatment of test organisms before their use in the test. There was nothing unusual about the test, no deviation from the test method or problems encountered. No control mortality was observed in any control solution during observation periods. The mean number of cystocarps per plant counted in this test must be >10 to be acceptable. Data for this test is as follows.

Natural seawater controls	46.6
Dry salt controls	33.1
Pooled control cystocarp count*	39.9

* as in EC guidance document on salinity adjustment, Dec 2001

Toxicity Test Results: Cystocarps per female branch as mean (standard deviation)

WQ-TOX-001	2.7 (2.8)
WQ-TOX-002	6.2 (6.3)
WQ-TOX-003	17.1 (8.7)
Signature M Moody	Date Nov 7/08

Saskatchewan Research Council
15 Innovation Boulevard, Saskatoon, SK S7N 2X8
Phone: 306-933-5469

Test Data Summary

SAMPLE			
Identification/Name	WQ-TOX-001, WQ-TOX-002, WQ-TOX-003		
Date Sampled	Oct 1/08		
Date/Time Received	Oct 2/08 4 pm	Test Initiation Date	Oct 2/08
Temperature Upon Receipt (°C)	7	Test Completion Date	Oct 9/08

ORGANISM INFORMATION			
Species	*Champia parvula*	Appearance/Health of Champia	excellent
Source	sexually mature male and female branches, obtained from USEPA, Hatfield Marine Science Center, Newport, Oregon in 1995		
Females, Presence of Trichognes	yes	Males, Presence of Sori with Spermatia	yes

TEST CONDITIONS			
Test Method	EPA 821-R-02-014, Method 1009.0 Third edition, October 2002	Dilution water	Natural seawater from Pacific Environmental Science Centre, North Vancouver B.C. as described on page 1
Test Type	static, non-renewal; two day effluent exposure followed by five to seven day recovery period in control medium for cystocarp development		
Test Vessels (Exposure & Recovery)	270 mL transparent polystyrene cups, transparent polystyrene lids		
Exposure Vessel Volume / Depth	100 mL / 4.5 cm	Recovery Vessel Volume /Depth	200 mL / 7.3 cm
Replicates/Conc.	3	No. of organisms (female/male)	5/2
Number and Concentrations of Test Solutions (%v/v)		Controls: (two) natural sea water, salt Tests: all samples tested at 100%	
Chemicals added to control/dilution water	Test Nutrients as described in method cited at 10 mL/L, analytical grade		

SAMPLE TREATMENT					
D.O. on sample without salinity adjustment (mg/L)	See pg 3	D.O. after salinity adjustment (mg/L)			Page 3
Aeration (duration/rate)	none	Filtration	none	pH Adjustments	none
Salinity Adjustment*	Not required				
Dry Salt for Salinity Adjustment*					
** as per EC guidance document on salinity adjustment, Dec 2001*					

EXPOSURE PERIOD (48 h) and RECOVERY PERIOD (5-7 days)			
Temperature, pH, D.O. and Salinity of test solutions and controls on following page			
Photoperiod (L:D h)	16:8	Agitation of tests and controls during exposure	gentle rotary shaking
Recovery Medium: natural sea water containing 10 mL/L Culture Nutrients (section 16.10.1.3 of cited method), prepared from analytical grade chemicals			
Aeration during recovery: gentle aeration supplied			

Date/Initial Nov 7/08 [illegible]

Saskatchewan Research Council
15 Innovation Boulevard, Saskatoon, SK S7N 2X8
Phone: 306-933-5469

Water Quality Data

Sample Identification/Name	WQ-TOX-001, WQ-TOX-002, WQ-TOX-003	

INITIAL WATER QUALITY	SAMPLE at test start, without salinity adjustment			TEST MEDIUM	RECOVERY MEDIUM
Sample #	001	002	003		
Temperature (°C)	24	25	25	22	23
Dissolved Oxygen (mg/L)	9.2	9.1	9.6	7.8	7.7
pH	7.06	6.91	6.84	8.35	8.40
Salinity (ppt)	21	20	8	30	30
Sample Description	Sl. cloudy pale yellow liquid			Length of Recovery Period (days)	5

Water Quality Data during Exposure Period (0, 24, 48 hr)

Concentration % (v/v)	Temperature (°C) exposure			Dissolved Oxygen (mg/L) exposure			pH exposure			Salinity (ppt) exposure		
	0	24	48	0	24	48	0	24	48	0	24	48
Control NSW[1]	22	23	23	7.3	8.0	8.3	8.48	8.53	8.43	30	30	30
Control IO	24	23	23	7.9	8.0	8.3	8.45	8.23	8.62	30	30	30
WQ-TOX-001	24	23	23	7.6	8.1	8.1	7.50	8.28	8.72	29	29	29
WQ-TOX-002	23	23	23	7.8	8.0	8.2	7.41	8.29	8.37	29	29	29
WQ-TOX-003	24	23	23	7.6	8.0	8.2	7.73	8.32	8.45	30	30	30

Recovery Period – Temperature Monitoring (initial daily entries)

Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
23	23	23	23	23	23	-	-

Champia (female) Mortality at end of Recovery Period

Concentration %v/v	control	001	002	003
	NSW[1]	100%	100%	100%
# Females dead[2]	0	0	0	0
% Mortality[2]	0	0	0	0
Description	Normal red	Fragile, some green areas	Red, slightly fragile, limp	Red, good condition

1 NSW natural sea wate, IO: Instant Ocean dry salts
2 same for all test units at each concentration

Date/Initial Nov 7/08 LM

Saskatchewan Research Council
15 Innovation Boulevard, Saskatoon, SK S7N 2X8
Phone: 306-933-5469

smart science solutions

Test Data

Sample Identification/Name	WQ-TOX-001, WQ-TOX-002, WQ-TOX-003	

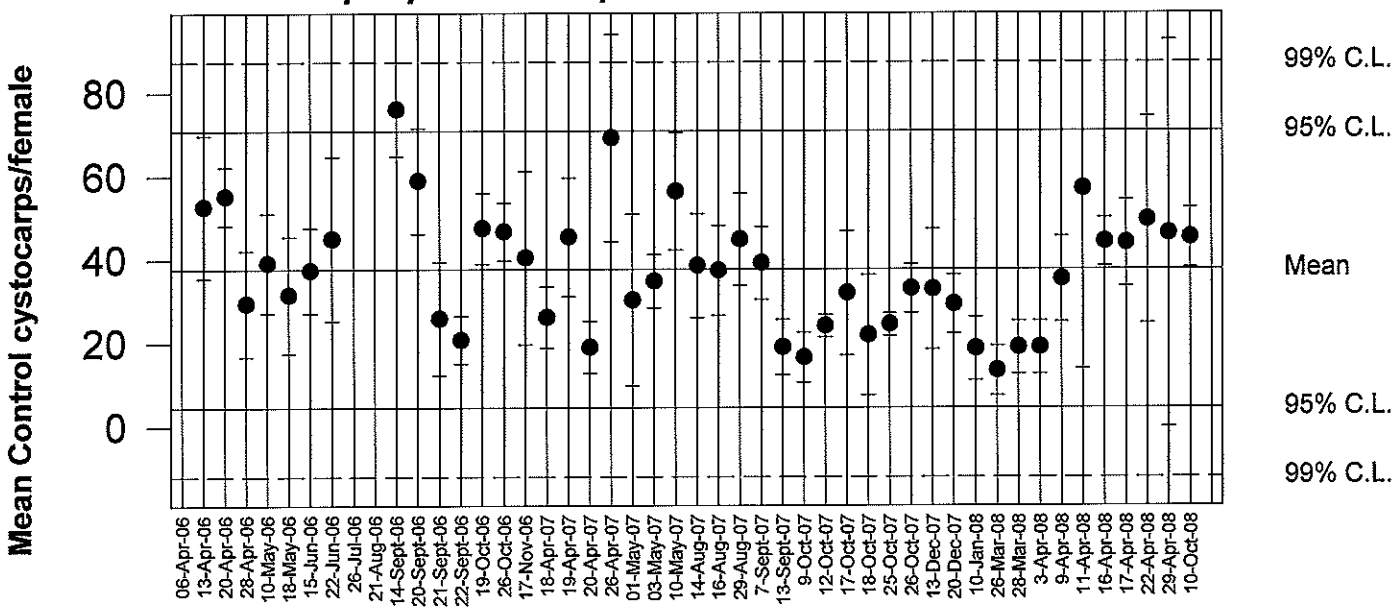
date of sampling: Oct 1/08 date received: Oct 2/08		Champia Cystocarp Counts				replicate mean	SD	group mean, SD	Comments
Control	57	47	46	55	41	49.2	6.6	46.6	healthy red color
Natural Seawater	23	34	32	37	42	33.6	7.0	13.1	normal growth
	62	37	40	71	44	50.8	14.9		
	60	50	32	51	71	52.8	14.4		
Control	16	49	35	18	19	27.4	14.3	33.1	healthy red color
Instant Ocean	22	25	30	32	34	28.6	5.0	11.5	normal growth
	33	31	54	42	25	37	11.3		
	21	45	35	52	44	39.4	11.9		
WQ-TOX-001	0	0	0	5	0	1	2.2	2.7	branches
	4	6	5	2	0	3.4	2.4	2.8	fragmented
	0	6	0	2	1	1.8	2.5		
	2	6	7	8	0	4.6	3.4		
WQ-TOX-002	1	0	6	2	0	1.8	2.5	6.2	branches
	23	7	1	2	10	8.6	8.8	6.3	fragmented
	2	0	14	4	7	5.4	5.5		
	5	4	12	17	6	8.8	5.5		
WQ-TOX-003	30	17	16	26	34	24.6	7.9	17.1	healthy red color
	18	25	26	12	27	21.6	6.4	8.7	normal growth
	19	17	12	17	14	15.8	2.8		
	3	6	10	9	4	6.4	3.0		

SD: Standard Deviation

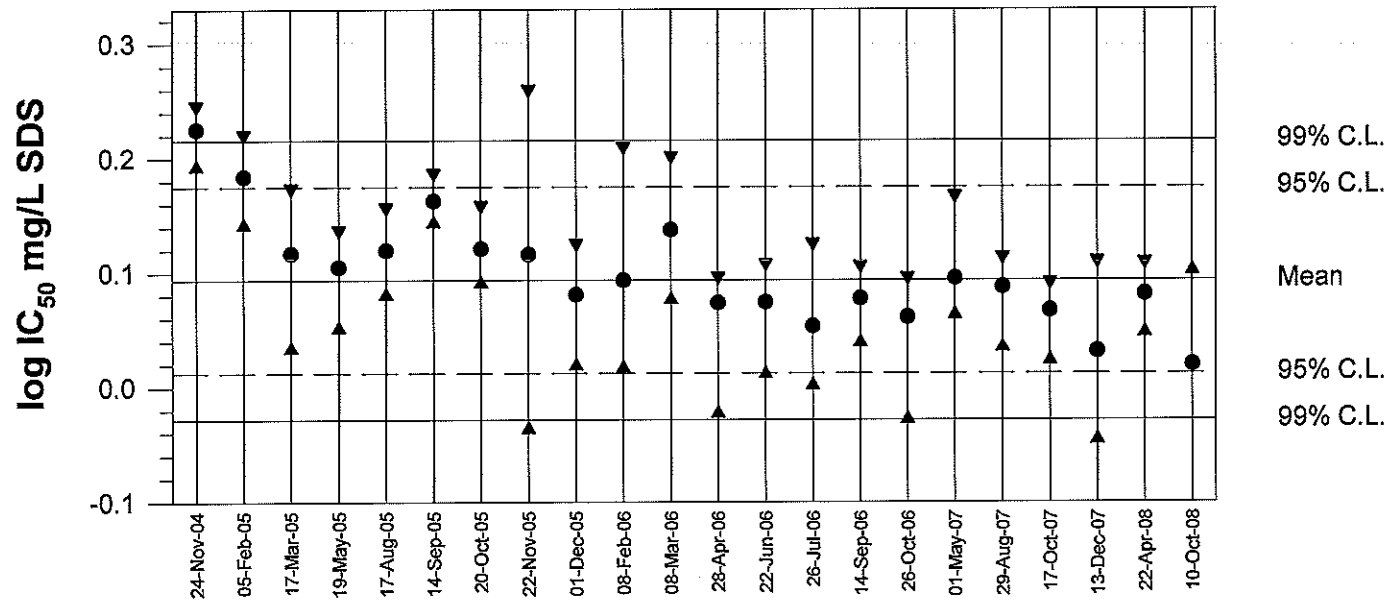
Date/Initial _____

Saskatchewan Research Council

Champia parvula Reproduction Test Control Charts



Control cystocarp count per female *Champia parvula* for tests from Apr 2006 to Oct 2008. Mean and 95% control limits for each test and cumulative mean, 95% and 99% control limits for all tests.
Cumulative mean: 37.7 (95% CL: 4-71)



Reference Toxicant Tests using Sodium dodecyl sulfate mg/L
Historical value (previous 20 tests) and 95% confidence limits 1.25 (1.05 - 1.48) mg/L
Data for most recent test
Oct 10/08: mean and 95% confidence limits 1.05 (0.83 - 1.26) mg/L

CETIS Summary Report

Link/Link Code: 05-2962-5884/17699Cp

Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Test Run No:	00-9672-4144	**Test Type:**	Champia	**Analyst:**	
Start Date:	02 Oct-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Laboratory Seawater
Ending Date:	09 Oct-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
17699-000	17-1203-2644	02 Oct-08 16:00	02 Oct-08 16:00	N/A	Battelle Labs	Ecological Risk Assessme
17699-003 Ref	01-0238-7777	01 Oct-08 12:15	01 Oct-08 16:30	24h		
17699-002	01-5675-2759	01 Oct-08 11:50	01 Oct-08 16:30	24h		
17699-001	01-3219-1912	01 Oct-08 11:23	01 Oct-08 16:30	25h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
17699-000	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-Lab Control		
17699-003 Ref	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-003		
17699-002	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-002		
17699-001	Surface Water	New Bedford Harbor Dredge Moni	WQ-TOX-001		

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Mean Cystocarps Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	33.1	30.86	35.34	27.4	39.4	1.094	5.99	18.1%	0.0%
17699-003 Ref	4	17.1	14.11	20.09	6.4	24.6	1.463	8.014	46.87%	48.34%
17699-002	4	6.15	4.921	7.379	1.8	8.8	0.601	3.292	53.53%	81.42%
17699-001	4	2.7	2.098	3.302	1	4.6	0.2944	1.612	59.72%	91.84%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17699-000	27.4	28.6	37	39.4
17699-003 Ref	24.6	21.6	15.8	6.4
17699-002	1.8	8.6	5.4	8.8
17699-001	1	3.4	1.8	4.6

CETIS Analytical Report

Link/Link Code: 05-2962-5884/17699Cp

Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	02-2859-6096	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	10 Nov-08 7:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	00-9672-4144	**Test Type:**	Champia	**Analyst:**	
Start Date:	02 Oct-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Laboratory Seawater
Ending Date:	09 Oct-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					46.45%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-003 Ref		17699-001	3.523	1.943	7.943	0.0062	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	414.72	414.72	1	12.41	0.0125	Significant Effect
Error	200.48	33.41333	6			
Total	615.2	448.1333	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	24.7	47.47	0.0258	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9258		0.4789	Normal Distribution

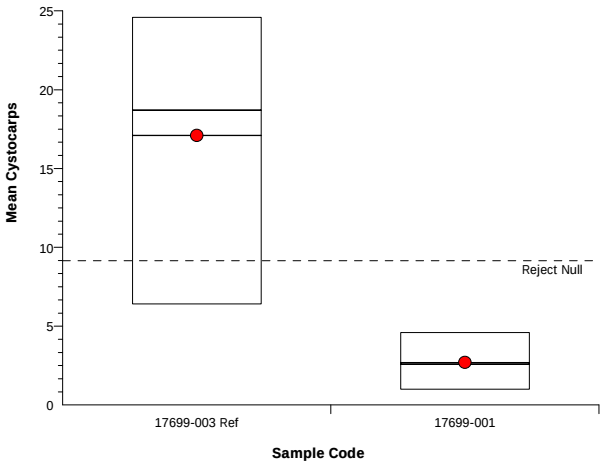
Mean Cystocarps Summary

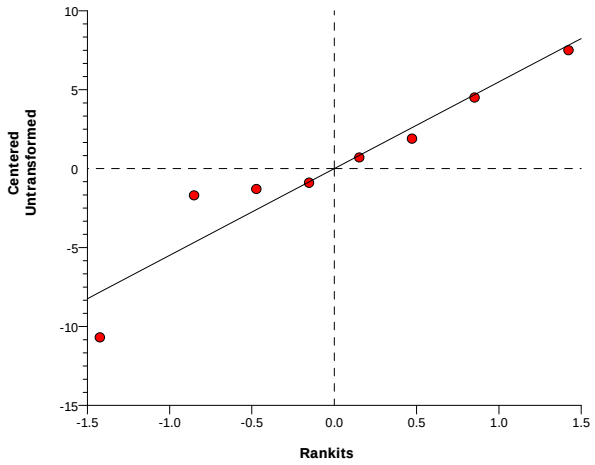
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-003 Ref	4	17.1	14.05	20.15	6.4	24.6	1.488	8.014	46.87%	0.0%
17699-001	4	2.7	2.087	3.313	1	4.6	0.2994	1.612	59.72%	84.21%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17699-003 Ref	24.6	21.6	15.8	6.4
17699-001	4.6	3.4	1.8	1

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	19-9725-2564	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	10 Nov-08 7:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	00-9672-4144	**Test Type:**	Champia	**Analyst:**	
Start Date:	02 Oct-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Laboratory Seawater
Ending Date:	09 Oct-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					49.23%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-003 Ref		17699-002	2.528	1.943	8.418	0.0224	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	239.805	239.805	1	6.389	0.0448	Significant Effect
Error	225.19	37.53167	6			
Total	464.995	277.3367	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.927	47.47	0.1780	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9575		0.7858	Normal Distribution

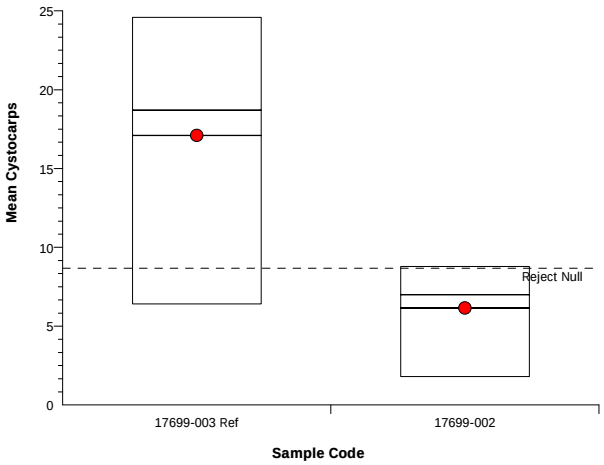
Mean Cystocarps Summary

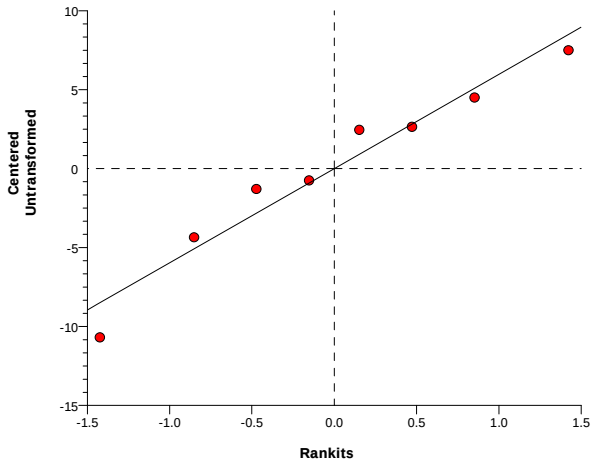
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-003 Ref	4	17.1	14.05	20.15	6.4	24.6	1.488	8.014	46.87%	0.0%
17699-002	4	6.15	4.898	7.402	1.8	8.8	0.6113	3.292	53.53%	64.04%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17699-003 Ref	24.6	21.6	15.8	6.4
17699-002	8.8	8.6	5.4	1.8

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	04-8620-3807	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	10 Nov-08 7:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	00-9672-4144	**Test Type:**	Champia	**Analyst:**	
Start Date:	02 Oct-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Laboratory Seawater
Ending Date:	09 Oct-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					18.21%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-000		17699-001	9.801	1.943	6.027	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1848.32	1848.32	1	96.07	0.0001	Significant Effect
Error	115.44	19.24	6			
Total	1963.76	1867.56	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	13.8	47.47	0.0584	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9804		0.9648	Normal Distribution

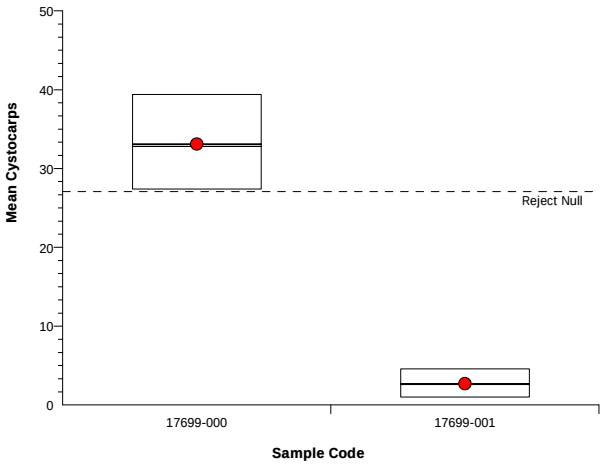
Mean Cystocarps Summary

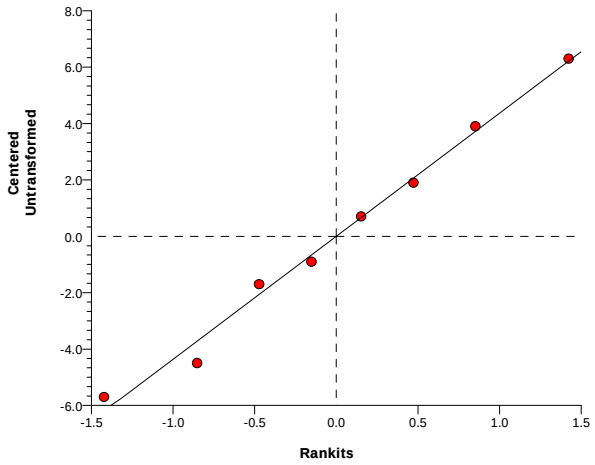
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	33.1	30.82	35.38	27.4	39.4	1.112	5.99	18.1%	0.0%
17699-001	4	2.7	2.087	3.313	1	4.6	0.2994	1.612	59.72%	91.84%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17699-000	39.4	37	28.6	27.4
17699-001	4.6	3.4	1.8	1

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	08-4995-6877	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	10 Nov-08 7:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	00-9672-4144	**Test Type:**	Champia	**Analyst:**	
Start Date:	02 Oct-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Laboratory Seawater
Ending Date:	09 Oct-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					20.06%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-000		17699-002	7.886	1.943	6.641	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1452.605	1452.605	1	62.19	0.0002	Significant Effect
Error	140.15	23.35833	6			
Total	1592.755	1475.963	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.311	47.47	0.3517	Equal Variances
Distribution	Shapiro-Wilk Normality	0.915		0.3906	Normal Distribution

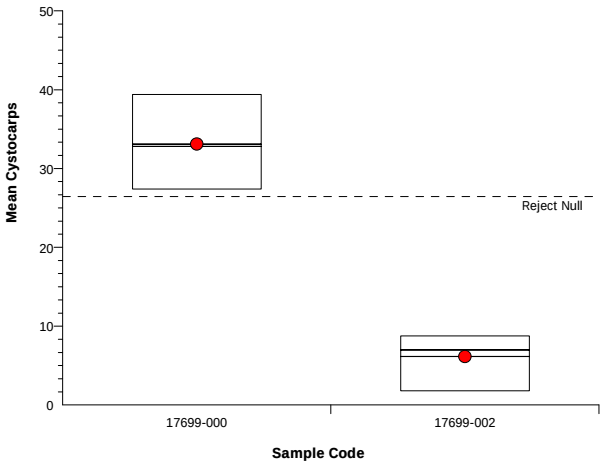
Mean Cystocarps Summary

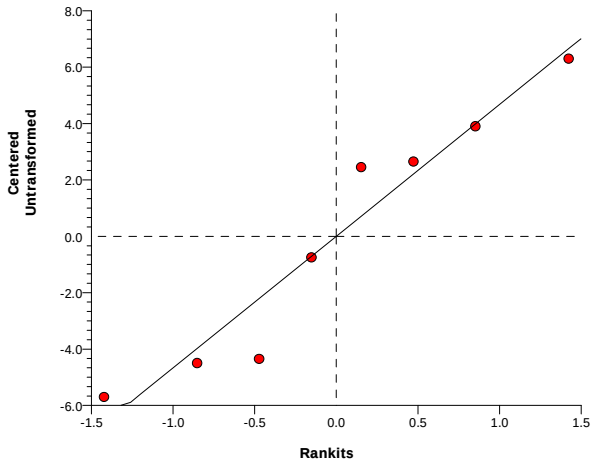
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	33.1	30.82	35.38	27.4	39.4	1.112	5.99	18.1%	0.0%
17699-002	4	6.15	4.898	7.402	1.8	8.8	0.6113	3.292	53.53%	81.42%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17699-000	39.4	37	28.6	27.4
17699-002	8.8	8.6	5.4	1.8

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test — **Saskatchewan Research Council**

Analysis No:	19-5691-1601	**Endpoint:**	Mean Cystocarps	**CETIS Version:**	CETISv1.6.4
Analyzed:	10 Nov-08 7:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	00-9672-4144	**Test Type:**	Champia	**Analyst:**	
Start Date:	02 Oct-08 12:00	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Laboratory Seawater
Ending Date:	09 Oct-08 12:00	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample Comments
17699-003 Ref	3.8 NTU.
17699-002	24 NTU.
17699-001	57 NU.

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					29.37%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
17699-000		17699-003 Ref	3.198	1.943	9.721	0.0093	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	512	512	1	10.23	0.0186	Significant Effect
Error	300.32	50.05333	6			
Total	812.32	562.0533	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.79	47.47	0.6443	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9261		0.4816	Normal Distribution

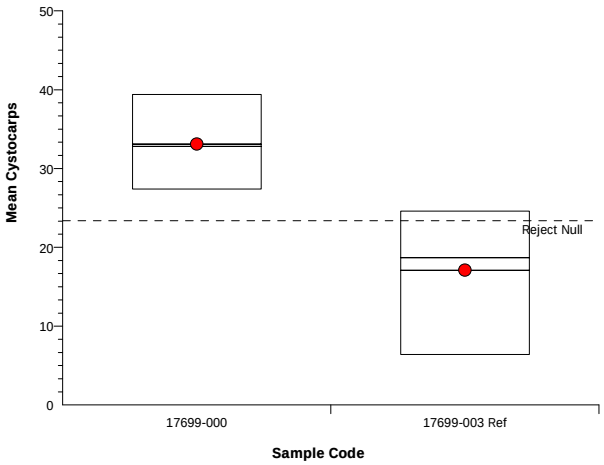
Mean Cystocarps Summary

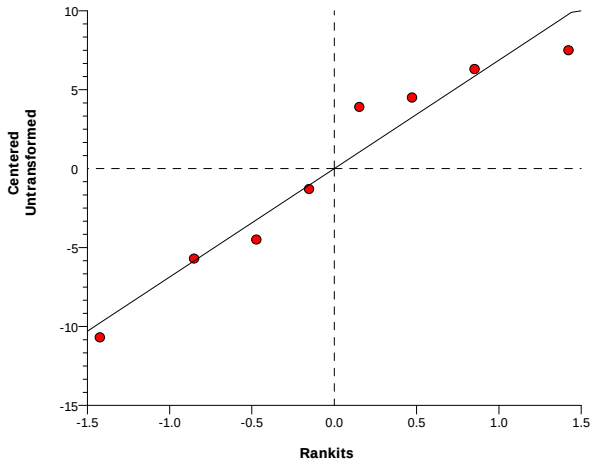
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
17699-000	4	33.1	30.82	35.38	27.4	39.4	1.112	5.99	18.1%	0.0%
17699-003 Ref	4	17.1	14.05	20.15	6.4	24.6	1.488	8.014	46.87%	48.34%

Mean Cystocarps Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
17699-000	39.4	37	28.6	27.4
17699-003 Ref	24.6	21.6	15.8	6.4

Graphics





SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 17699	LOCATION: New Bedford Harbor				
CHEMISTRY	Lab Salt Control	-001	-002	-003	-004
AMMONIA	17724-015	004	005	006	
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004
SALINITY (ppt)	25.0	20.7	20.4	9.0	
pH (SU)	7.92	7.13	7.47	6.80	
TRC (mg/L)	<0.02	<0.02	<0.02	<0.02	
DO (mg/L)	7.1	9.2	7.7	9.4	
S/C (µmhos/cm)	39200	32460	31550	14930	
WQ STATION USED	1	1	1	1	
INITIALS	APL	APL	APL	APL	
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004
SAMPLE (mLs)	—	12000	16000	16000	
SEA SALT (g)	—	59	84	294	
DATE:	10-2-08	10-2-08	10-2-08	10-2-08	
TIME:	0900	0910	1000	1010	
INITIALS:	APL	APL	APL	APL	

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004

Americamysis bahia 7 DAY CHRONIC ASSAY
NEW WATER QUALITIES

STUDY: 17699	CLIENT: BATTELLE	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY

		NEW DISSOLVED OXYGEN (mg/L)							NEW SALINITY (ppt)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	7.8	6.8	6.9	7.1	7.1	7.1	7.4	25	25	26	26	28	25	25
-001	A	8.2	7.6	8.0	6.9	8.2	6.7	8.1	25	25	25	25	25	25	25
-002	A	7.7	7.4	7.6	6.8	7.7	6.6	8.1	25	25	25	25	25	25	25
-003	A	7.7	6.9	7.5	6.8	7.3	6.4	8.1	24	24	25	25	25	25	25
~~-004~~	~~A~~														

SJ 10/3/08

		NEW pH (SU)							NEW TEMPERATURE (°C)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6
LAB	A	8.18	8.12	8.07	8.08	8.18	7.88	7.96	25	25	25	25	24	24	25
-001	A	7.58	7.76	7.61	7.55	7.61	7.59	7.66	25	25	25	25	24	24	25
-002	A	7.68	7.71	7.66	7.64	7.66	7.64	7.63	25	25	25	25	24	24	25
-003	A	7.78	7.76	7.77	7.70	7.76	7.72	7.70	25	25	25	25	24	24	25
~~-004~~	~~A~~														
INC TEMP:		25	25	25	25	25	25	25							
DATE:		10/2/08	10/3	10/4	10/5	10/6	10/7	10/8							
TIME:		1350	1100	1015	1150	1150	1005	1030							
INIT:		WM	SJ	DM	UB	UB	APC	APC							

WATER QUALITY METERS USED NEW WATER QUALITIES								
	0	1	2	3	4	5	6	7
Water Quality Station #		1	1	1	1	1	2	
Initials		WM SJ	DM	DM	UB	APC	APC	
Date	10/2/08	10/3/08	10-4-08	10-5-08	10/6	10-7	10-8	

Americamysis bahia 7 DAY CHRONIC ASSAY
OLD WATER QUALITIES

STUDY: 17699	CLIENT: BATTELLE	LOCATION: NEW BEDFORD	LAB CONTROL: HAMPTON ESTUARY

OLD SALINITY (ppt)

Conc	Rep	1	2	3	4	5	6	7
Control	A	25	26	26	27	27	25	25
-001	A	26	25	26	25	25	25	25
-002	A	26	26	26	26	26	26	26
-003	A	25	25	25	25	25	25	25
~~-004~~	~~A~~							

OLD pH (SU)

Conc	Rep	1	2	3	4	5	6	7
Control	A	8.03	7.83	7.87	8.02	8.11	7.93	7.95
-001	A	7.91	7.93	7.82	7.90	7.87	7.85	7.84
-002	A	7.88	7.80	7.81	7.88	7.85	7.88	7.84
-003	A	7.94	7.88	7.86	7.95	7.92	7.96	7.90
~~-004~~	~~A~~							

10/3/08 SJ

OLD TEMPERATURE (°C)

Conc	Rep	1	2	3	4	5	6	7
Control	A	25	24	24	25	25	25	25
-001	A	25	24	24	25	25	25	25
-002	A	25	24	24	25	25	25	26
-003	A	25	24	24	25	25	25	25
~~-004~~	~~A~~							
INC TEMP:		25	25	25	25	25	25	25
DATE:		10/3/08	10-4	10-5	10/6	10-7	10-8	10-9
TIME:		1015	0950	1040	0935	0900	0950	0915
INITIALS:		SJ	DM	DM	SJ	APC	APC	APC

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

- Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution
- 8 replicates per site with 5 organisms each

- Test Temperature: 26±1°C
- Salinity: 25 ±2ppt
- Dissolved Oxygen: >4.3 mg/L

- Photoperiod will be 16 hours light and 8 hours dark.
- Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

WATER QUALITY METERS USED
OLD WATER QUALITIES

	0	1	2	3	4	5	6	7
Water Quality Station #		1	1	1	1	1	1	1
Initials		SJ	DM	DM	SJ	APC	APC	APC
Date		10/3/08	10-4-08	10-5-08	10/6	10-7	10-8	10-9

Americamysis bahia 7 DAY CHRONIC ASSAY
SAMPLE USE RECORD

STUDY: 17699 | **CLIENT:** BATTELLE - New Bedford

SPECIES: *A. bahia* | **TEST:** chronic renewal

Sample	Day: 0 Volume Used (mL)	Day: 0 ESI Cube ID	Day: 1 Volume Used (mL)	Day: 1 ESI Cube ID	Day: 2 Volume Used (mL)	Day: 2 ESI Cube ID
Lab Control	1600	n/a	1200	n/a	1200	n/a
-001	1600	-001	↓	-001	↓	-001
-002	1600	-002	↓	-002	↓	-002
-003	1600	-003	↓	-003	↓	-003
-004	—	—	—	—	—	—

Day	Date	Time	Init
0	10/2/08	1340	WM
1	10/3	1045	SJ
2	10/4	1010	DM
3	10.5	1050	DM
4	10/6	1105	LB
5	10.7	1000	APL
6	10.8	1020	APL

Sample	Day: 3 Volume Used (mL)	Day: 3 ESI Cube ID	Day: 4 Volume Used (mL)	Day: 4 ESI Cube ID	Day: 5 Volume Used (mL)	Day: 5 ESI Cube ID
Lab Control	1200	n/a	1200	n/a	1200	n/a
-001	↓	-001	↓	001	↓	001
-002	↓	-002	↓	002	↓	003
-003	↓	-003	↓	003	↓	003
-004	—	—	—	—	—	—

Sample	Day: 6 Volume Used (mL)	Day: 6 ESI Cube ID
Lab Control	1200	n/a
-001	↓	001
-002	↓	002
-003	↓	003
-004	—	—

Aquatic Research Organisms

DATA SHEET

Rec 10/1

I. Organism History

Species: AMERICAMYSIS BAHIA

Source: Lab reared ✓ Hatchery reared ____ Field collected ____

Hatch date: 9-24-08 Receipt date: ____

Lot number: 092408MS Strain: ____

Brood origination: FLORIDA

II. Water Quality

Temperature: 25 °C Salinity: ≈30 ppt D.O.: — ppm

pH: 7.8 su Hardness: — ppm Alkalinity: — ppm

III. Culture Conditions

Freshwater ____ Saltwater ✓ Other ____

Recirculating ✓ Flow through ____ Static ____

DIET: Flake food ✓ Phytoplankton ____ Trout chow ✓

Artemia ✓ Rotifers ____ YCT ____ Other ENCAP. Shrimp Diet

Prophylactic treatments: ____

Comments: ____

IV. Shipping Information

Client: ESI # of Organisms: 300+

Carrier: ____ Date shipped: 10-1-08

Biologist: Mark Doerenzott

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

ESI

EnviroSystems, Inc.
One Lafayette Road
P.O. Box 778
Hampton, NH 03843-0778
Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

ESI STUDY NUMBER: 17629 **CLIENT:** Battelle

SAMPLE RECEIPT:
DATE: 8/21/08 TIME: 1640 BY: KS

DELIVERED VIA: ☐ FEDEX ☐ CLIENT ☒ ESI ☐ UPS ☐ OTHER

LOGGED INTO LAB:
DATE: 8/22/08 TIME: 1100 BY: SJ

SAMPLE CONDITION:

CHAIN OF CUSTODY:	☒ YES		☐ NO
CHAIN OF CUSTODY SIGNED:	☒ YES		☐ NO
CHAIN OF CUSTODY COMPLETE:	☒ YES		☐ NO
SAMPLE DATE:	☒ YES		☐ NO
SAMPLE TIME RECORDED:	☒ YES		☐ NO
SAMPLE TYPE IDENTIFIED:	☒ YES		☐ NO
CUSTODY SEAL IN PLACE:	☐ YES	☒ NA	☐ NO
SHIPPING CONTAINER INTACT:	☒ YES		☐ NO
SAMPLE TEMPERATURE (AT ARRIVAL): 4 °C			
DOES CLIENT NEED NOTIFICATION OF TEMPERATURE?	☐ YES		☒ NO
SAMPLE ARRIVED ON ICE:	☒ YES		☐ NO

COMMENTS: See COC

17629

Battelle
. . . Putting Technology To Work

Chain of Custody

Proj. No	Proj. Name
6606422	New Bedford Harbor Water Quality

SAMPLERS: Signature: Matthew R Lynch, Amanda Maxemchuk

ANALYSIS REQUESTED → "NUMBER OF CONTAINERS"

DATE	TIME	Field ~~BATTELLE~~ ID	Lab ~~CLIENT~~ ID	SAMPLE DESCRIPTION	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	~~OTHER~~ Toxicity	ACIDIFIED	PRESERVED 4°C	Total Number of Containers
8/21/08	1420	WQ-TOX-01-082	108 -001	Tox Sample from 25 to 32 NTU								X		X	1
↓	1502	WQ-TOX-02-082	108 -002	Tox Sample from 14 to 20 NTU								X		X	1
	1520	WQ-TOX-03-082	108 -003	Tox Sample from .2 to .3 NTU								X		X	1
8/22/08	1100	WQ-TOX-001	-004	NH_3											
↓	↓	WQ TOX-002	-005	↓											
		WQ TOX-003	-006												

Relinquished by:	Date/Time	Received by:	Date/Time
Matthew R Lynch	8/21/08 1640	[illegible]	8/21/08 1640
Relinquished by:	Date/Time	Received by:	Date/Time

Comments:

ORIGINAL

ESI

EnviroSystems, Inc.
One Lafayette Road
P.O. Box 778
Hampton, NH 03843-0778
Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

ESI STUDY NUMBER: 17699 **CLIENT:** Battelle

SAMPLE RECEIPT:
DATE: 10/1/08 TIME: 1630 BY: SJ

DELIVERED VIA: ☐ FEDEX ☒ CLIENT ☐ ESI ☐ UPS ☐ OTHER

LOGGED INTO LAB:
DATE: 10/1/08 TIME: 1630 BY: SJ

SAMPLE CONDITION:

CHAIN OF CUSTODY:	☒ YES		☐ NO
CHAIN OF CUSTODY SIGNED:	☒ YES		☐ NO
CHAIN OF CUSTODY COMPLETE:	☒ YES		☐ NO
SAMPLE DATE:	☒ YES		☐ NO
SAMPLE TIME RECORDED:	☒ YES		☐ NO
SAMPLE TYPE IDENTIFIED:	☒ YES		☐ NO
CUSTODY SEAL IN PLACE:	☐ YES	☒ NA	☐ NO
SHIPPING CONTAINER INTACT:	☒ YES		☐ NO
SAMPLE TEMPERATURE (AT ARRIVAL):	4 °C		
DOES CLIENT NEED NOTIFICATION OF TEMPERATURE?	☐ YES		☒ NO
SAMPLE ARRIVED ON ICE:	☒ YES		☐ NO

COMMENTS:

ESI 17677

Battelle

The Business of Innovation

Chain of Custody

397 Washington Street
Duxbury, MA 02332
Phone: 781-952-5200
Fax: 781-934-2124

Proj. No: G606422

Proj. Name: New Bedford Harbor Water Quality

SAMPLERS: Signature

ANALYSIS REQUESTED → "NUMBER OF CONTAINERS"

DATE	TIME	Field ~~BATTELLE~~ ID	Lab ~~CLIENT~~ ID	SAMPLE DESCRIPTION	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	~~OTHER~~ Toxicity	ACIDIFIED	PRESERVED	Total Number of Containers
10/1/08	11:23	WQ-TOX-001-	100108	50-65 NTU station: 57 NTU								✓			1
↓	11:50	WQ-TOX-002-	100108	19-26 NTU station: 24 NTU								✓			1
	12:5	WQ-TOX-003-	100108	3.8 NTU station: NREF								✓			1
		~~EB~~ ①													

Relinquished by:	Date/Time		Received by:	Date/Time	
	10/1/08	1423	PATRICK CURRAN	10/1/08	1423
Relinquished by: PATRICK CURRAN	Date/Time		Received by:	Date/Time	
	10/1/08 ~~1630~~	1630		10.1.08	1630

Comments:

① disregard AEM 10/1/08

ORIGINAL