ESI

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August 6, 2009

Mr. Dave Walsh
Woods Hole Group, Inc.
81 Technology Park Drive
Falmouth, Massachusetts 02536

Dear Mr. Walsh;

Enclosed please find an electronic copy of our report evaluating the toxicity of samples received as part of the New Bedford Harbor surface water quality monitoring program for the 2009 sampling period. This report evaluates results of one (1) sample collected on July 22, 2009 and diluted to four (4) target concentrations (50, 100, 150, and 200 NTUs). Acute and chronic toxicity was evaluated using the mysid shrimp, *Americamysis bahia*, the sea urchin, *Arbacia punctulata*, and red macro algae, *Champia parvula*.

Please do not hesitate to call me, Reneé McIsaac or Petra Karbe should you have any questions regarding the report.

Sincerely,

EnviroSystems, Incorporated

Kenneth A. Simon
President

Enclosure

Report; Two (2) Copies
Study Number 18770-09-07

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

July 22, 2009 Sampling Event

NED ACOE Job Number: TO-0010

Task Order No.: ESI0002

Prepared for

Woods Hole Group, Inc.
81 Technology Park Drive
Falmouth, Massachusetts 02536

Prepared by

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1 Lafayette Road
Hampton, New Hampshire 03843

July 2009
Reference Number: Woods Hole Group, Inc. 18770-09-07

Biomonitoring of Surface Water Samples
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1.0 INTRODUCTION

This report provides a summarization of data generated from acute and chronic exposure screening assays evaluating surface water samples collected from New Bedford Harbor in New Bedford, Massachusetts. 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 additional dilutions. Assays were conducted based on water quality levels in the vicinity of dredging operations. Samples were collected under the supervision of Woods Hole Group, Inc. personnel from the Falmouth, Massachusetts office. Testing was based on programs and protocols developed by the US EPA (2002) and included the following assays; 48 hour acute 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.

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 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 $\leq$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 were from cultures maintained by Saskatchewan Research Council. 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

A grab surface water sample was collected in New Bedford Harbor and diluted, in the field, to nominal 50, 100, 150, and 200 NTUs by Woods Hole Group, Inc. staff on July 22, 2009. Actual turbidity levels were documented by Alpha Analytical Labs after the start of the assays. Sample receipt information is shown in Table 1. Samples were placed in polyethylene cubitainers for shipment to the laboratory. One 5.0 gallon cubitainer was 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 0.02 mg/L). Prior to use in the assays, the salinity of the samples was adjusted, as 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. When necessary, 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. A summary of "As Received" water quality data are summarized in Table 2.

Laboratory control water used for the 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 (48 hour acute portion), collected from Hampton Harbor, 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. Control water used in the algal assays conducted by AquaTox (acute and chronic portions) was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted, as required, using commercial sea salts.

2.4 Bioassays

2.4.1 *Americamysis bahia* Acute Exposure Assays

The endpoint for the *A. bahia* bioassay was survival (acute). The 48 hour static acute toxicity tests were conducted at 25±1°C with a photoperiod of 16:8 hours light:dark. Test chambers for the acute assays were 250 mL glass beakers containing 200 mL test solution in each of 4 replicates with 10 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. Specific conductivity was measured in one replicate of each sample at the start of the assay. Mysids were not fed during the assay.

2.4.2 *Arbacia punctulata* Chronic Exposure Fertilization Assays

The endpoint for the *A. punctulata* bioassay was fertilization. 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* Acute Exposure Assays

The target endpoints for the acute *C. parvula* bioassay were coloration and necrosis. The 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. Upon test termination, plants were examined to determine the physical condition and coloration of the individual branches. Branches showing signs of degeneration were noted and used to establish an acute endpoint. Data for the acute endpoints was generated by ESI.

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 4, 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 assays conducted during the monitoring period documented one protocol deviations. Typically, the 48 hour acute exposure assay with the mysid shrimp is completed using <5 day old test organisms, however 7 day old organisms were acquired in anticipation of running the modified 7-day chronic assay which includes a 48-hour acute exposure endpoint. It is the opinion of ESI's study director that this deviation had no impact on the outcome of the assay.

3.0 RESULTS SUMMARY

Table 3 provides summaries of survival, growth, development and reproduction endpoints and associated statistical analyses. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

For this round of sample analysis there were was one reference site sample (DS-TOX-005-072209). The laboratory control and reference site were both used for statistical comparisons against the four samples provided by Woods Hold Group (DS-TOX-001-072209 through DS-TOX-004-072209).

3.1*Americamysis bahia* Acute Exposure Bioassay

Minimum test acceptability criteria for the acute exposure bioassay require $\geq$90% survival in the control concentrations. Achievement of these results indicate that healthy test organisms were used. See Table 3 for test acceptability and data summary.

3.2 *Arbacia punctulata* Chronic Fertilization Bioassay

Protocol specifies a 70% to 90% fertilization rate for *Arbacia punculata* (EPA 2002). Achievement of these results indicate that healthy test organisms were used. See Table 3 for test acceptability and data summary.

3.3*Champia parvula* Acute Exposure Bioassay

The acute exposure bioassay was considered to be acceptable if no notable branch necrosis was observed and appropriate coloration of test species was achieved in the laboratory control treatment. Achievement of these results indicate that healthy test organisms were used. See Table 3 for test acceptability and data summary.

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. Sample Receipt Summary. New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	ESI Code	Matrix	Collection		Receipt	
			Date	Time	Date	Time
DS-TOX-001-072209	18770-001	Water	07/22/09	0826	07/22/09	1747
DS-TOX-002-072209	18770-002	Water	07/22/09	0952	07/22/09	1747
DS-TOX-003-072209	18770-003	Water	07/22/09	0951	07/22/09	1747
DS-TOX-004-072209	18770-004	Water	07/22/09	0951	07/22/09	1747
DS-TOX-005-072209	18770-005	Water	07/22/09	0949	07/22/09	1747

Table 2 Summary of "As Received" Sample Physical and Chemical Characteristics. New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Field ID	ESI Code	Target Dilution (NTUs) / Reference	Measured Turbidity*	Ammonia (mg/L)	pH (SU)	Salinity (‰)	Total Residual Chlorine (mg/L)
DS-TOX-001-072209	18770-001	200	190	0.15	7.27	23	<0.02
DS-TOX-002-072209	18770-002	150	140	<0.1	7.37	19	<0.02
DS-TOX-003-072209	18770-003	100	110	<0.1	7.40	17	<0.02
DS-TOX-004-072209	18770-004	50	92	<0.1	7.54	22	<0.02
DS-TOX-005-072209	18770-005	Reference	7.2	<0.1	7.71	27	<0.02

COMMENTS:
* Turbidity was measured by Woods Hole Group and provided via email communication.

Table 3. Endpoint Summary Table - New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Sample ID	Turbidity (NTUs)	Reps	Mean	Min	Max	CV	Significant Difference vs			
							p Value	Lab	p Value	TOX-005
Arbacia punctulata										
			Portion Fertilized							
Lab Control			98.8%	97.2%	100.0%	1.20%	-	-	-	-
DS-TOX-005	7.2		99.1%	98.1%	100.0%	1.09%	0.6185	NO	-	-
DS-TOX-001	190	4	93.7%	92.6%	96.2%	1.80%	0.0015	YES	0.0012	YES
DS-TOX-002	140		90.3%	88.0%	92.5%	2.04%	0.0002	YES	0.0001	YES
DS-TOX-003	110		98.1%	94.3%	100.0%	2.60%	0.3650	NO	0.2888	NO
DS-TOX-004	92		98.0%	97.0%	99.0%	0.84%	0.1386	NO	0.0869	NO
Americamysis bahia										
			Day 1 Survival							
Lab Control	-		100.0%	100.0%	100.0%	0.00%	-	-	-	-
DS-TOX-005	7.2		100.0%	100.0%	100.0%	0.00%	0.4429	NO	-	-
DS-TOX-001	190		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-002	140	4	100.0%	100.0%	100.0%	0.00%	0.4429	NO	0.4429	NO
DS-TOX-003	110		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-004	92		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
			Day 2 Survival							
Lab Control	-		100.0%	100.0%	100.0%	0.00%	-	-	-	-
DS-TOX-005	7.2		100.0%	100.0%	100.0%	0.00%	0.4429	NO	-	-
DS-TOX-001	190		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-002	140	4	100.0%	100.0%	100.0%	0.00%	0.4429	NO	0.4429	NO
DS-TOX-003	110		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
DS-TOX-004	92		97.5%	90.0%	100.0%	5.13%	0.3429	NO	0.3429	NO
Champia parvula										
			Day 2 Coloration/Necrosis							
Lab Control	-		4.0	4.0	4.0	0.00%	-	-	-	-
DS-TOX-005	7.2		3.2	3.0	3.4	5.10%	0.0143	YES	-	-
DS-TOX-001	190	4	0.0	0.0	0.0	0.00%	0.0143	YES	0.0143	YES
DS-TOX-002	140		0.8	0.6	1.0	20.41%	0.0143	YES	0.0000	YES
DS-TOX-003	110		2.0	1.8	2.0	5.13%	0.0143	YES	0.0000	YES
DS-TOX-004	92		2.9	2.8	3.0	3.98%	0.0000	YES	0.0120	YES

Table 4 Reference Toxicant Summary. New Bedford Harbor Surface Water Quality Monitoring July 22, 2009 Sampling Event. New Bedford Harbor Dredge Plume Monitoring Program.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
A. bahia						
06/17/09	Survival	LC-50	23.8	20.8	16.2 - 25.4	SDS (mg/L)
05/27/09	Survival	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
05/27/09	Growth	C-NOEC	5.0	5.0	2.5 - 10.0	SDS (mg/L)
A. punctulata						
06/18/09	Fertilization	C-NOEC	<1	10.0	1.0 - 5.0	Copper (µg/L)
06/18/09	Fertilization	IC-25	1.0	19.9	0 - 66.1	Copper (µg/L)
C. parvula						
06/08/09	Reproduction	IC-25	0.1	0.11	0.065 - 0.178	SDS (mg/L)

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

APPENDIX A

SUPPORT DATA

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

25±2ppt

ACUTE BIOASSAY DATA SUMMARY

STUDY: 18770

CLIENT: Woods Hole Group

TEST ORGANISM: *A. bahia*

SAMPLE: New Bedford Harbor

ORGANISM SUPPLIER/BATCH/AGE: *See Organism Culture Sheet*

"AS RECEIVED" EFFLUENT AND DILUENT CHEMISTRIES

	TRC	TS/TSS	AMM	TOC	T.METAL	SAL	pH	S/C
EFF								
DIL								

CONC	REP	SURVIVAL			DO (mg/L)			pH (SU)			TEMP (°C)			SALINITY (ppt)			S/C (µmhos/cm)
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48	0
LAB	A	10	10	10	7.2	6.7	6.2	7.97	7.94	7.83	25	25	24	24	25	25	38360
	B	10	10	10	7.2	6.7	5.9										
	C	10	10	10	7.2	6.7	6.0										
	D	10	10	10	7.2	6.8	5.5		7.92								
Reference Site 005	A	10	10	10	~~6.6~~ 7.4	6.8	5.6	7.47	~~7.82~~ (EB)	7.78	25	25	24	~~24~~ 27 (EB)	~~24~~ 27 (EB)	28	42010
	B	10	10	10	~~6.5~~ 7.4	6.9	5.2										
	C	10	10	10	~~6~~ 7.3	7.0	5.6										
	D	10	10	10	7.2	6.9	5.7										
50 NTU 004	A	10	10	10	7.0	6.9	5.9	7.26	7.87	7.80	25	25	24	25	~~24~~ 26	26	39170
	B	10	10	10	7.1	7.0	5.8										
	C	10	10	10	7.1	7.0	5.9										
	D	10	9	9	7.2	7.0	5.8										
100 NTU 003	A	10	10	10	6.6	7.0	5.9	7.31	7.89	7.80	25	25	24	24	~~25~~ 25	25	38350
	B	10	9	9	6.7	7.0	5.5										
	C	10	10	10	6.6	7.0	5.7										
	D	10	10	10	6.7	7.0	6.0										
DATE		7/23	7/24	7/25/09	7/23/09	7/24	7/25										
TIME		1555	1420	1420	1545	1405	1645										
INITIALS		SJ	SJ	WM	SJ	SJ	ME										

ACUTE BIOASSAY DATA SUMMARY

STUDY: 18770	SAMPLE: New Bedford Harbor
CLIENT: Woods Hole Group	TEST ORGANISM: *A. bahia*

CONC	REP	SURVIVAL			DO (mg/L)			pH (SU)			TEMP (°C)			SALINITY (ppt)			S/C (µmhos/cm)
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48	0
150 NTU	A	10	10	10	6.6	7.0	5.9	7.29	7.87	7.90	25	25	24	~~25~~ 25	26	26	39620
	B	10	10	10	6.7	7.0	6.0										
002	C	10	10	10	6.7	7.0	6.2										
	D	10	10	10	6.7	7.0	6.0										
200 NTU	A	10	10	10	6.6	7.0	6.0	7.28	7.82	7.84	25	25	24	~~24~~ 24	24	25	36850
	B	10	10	10	6.5	7.0	5.9										
001	C	10	10	10	6.5	7.0	5.8										
	D	10	9	9	6.5	7.0	6.2										
	A																
	B																
	C																
	D																
	A																
	B																
	C																
	D																
DATE		7/23	7/24	7/25	7/23/04	7/24	7/25										
TIME		1555	1440	1420	1545	1405	1645										
INITIALS		SJ	SJ	WM	SJ	SJ	VC										

CETIS Summary Report

Americamysis 48-Hr Survival Test **EnviroSystems, Inc.**

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18770-000	06-7167-7012	23 Jul-09 12:00	23 Jul-09 12:00	4h	Woods Hole Group	Ecological Risk Assessme
18770-005	03-9927-1818	22 Jul-09 09:49	22 Jul-09 17:47	30h		
18770-001	15-6024-8561	22 Jul-09 08:26	22 Jul-09 17:47	32h		
18770-002	05-1145-9131	22 Jul-09 09:52	22 Jul-09 17:47	30h		
18770-003	01-6638-4937	22 Jul-09 09:51	22 Jul-09 17:47	30h		
18770-004	06-1076-1745	22 Jul-09 09:51	22 Jul-09 17:47	30h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18770-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18770-005	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-005-072209 (Reference		
18770-001	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-001-072209 (190 NTU)		
18770-002	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-002-072209 (140 NTU)		
18770-003	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-003-072209 (110 NTU)		
18770-004	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-004-072209 (092 NTU)		

24h Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-004	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%

48h Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%
18770-004	4	0.975	0.9563	0.9937	0.9	1	0.009129	0.05	5.13%	2.5%

24h Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	1	1	1	1
18770-005	1	1	1	1
18770-001	1	1	1	0.9
18770-002	1	1	1	1
18770-003	1	0.9	1	1
18770-004	1	1	1	0.9

48h Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	1	1	1	1
18770-005	1	1	1	1
18770-001	1	1	1	0.9
18770-002	1	1	1	1
18770-003	1	0.9	1	1
18770-004	1	1	1	0.9

Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	17-8622-6234	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:37	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

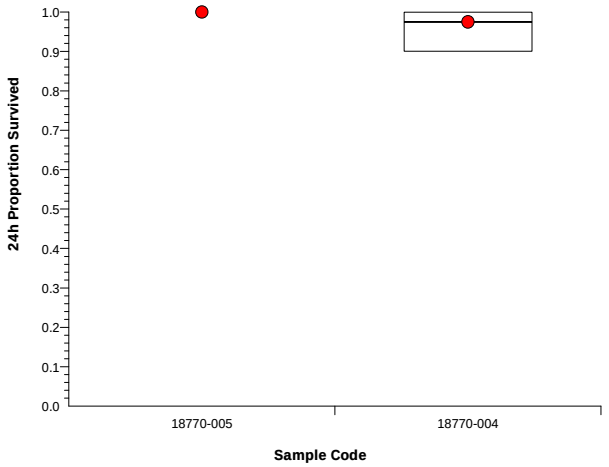
24h Proportion Survived Summary

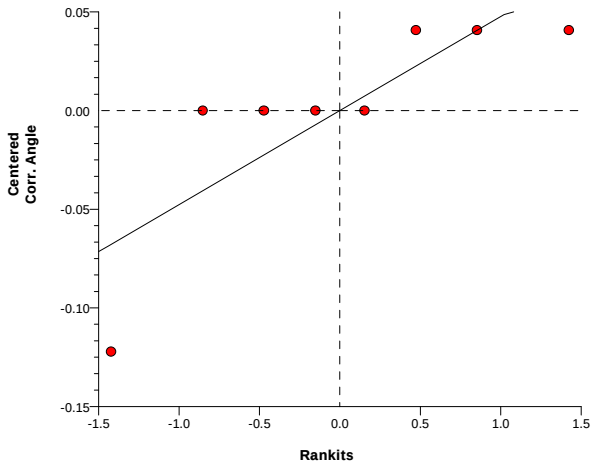
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	02-9572-0498	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:37	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

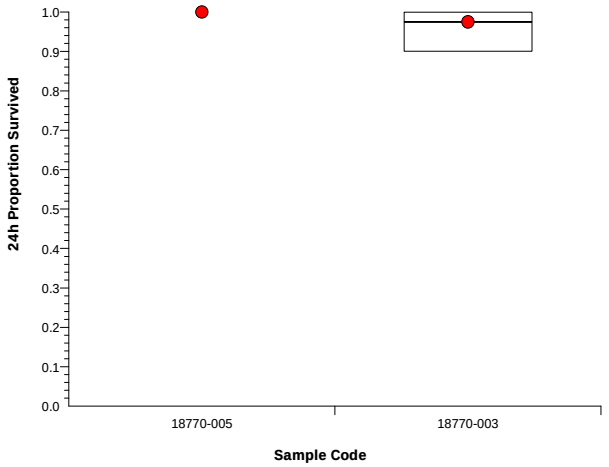
24h Proportion Survived Summary

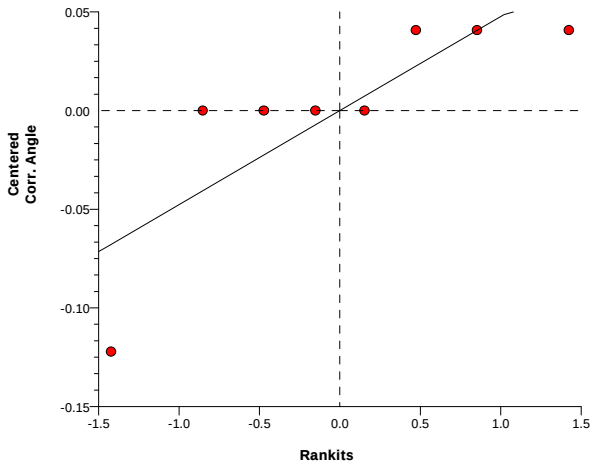
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	12-4998-4748	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

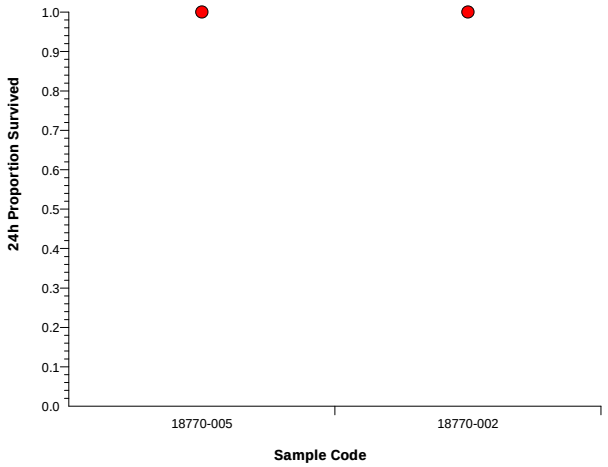
24h Proportion Survived Summary

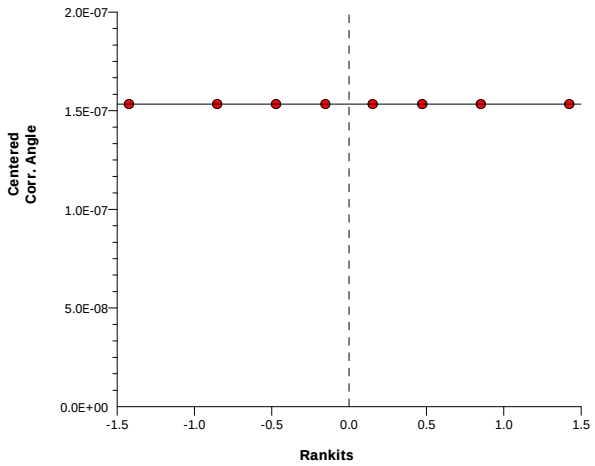
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	06-0548-8740	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

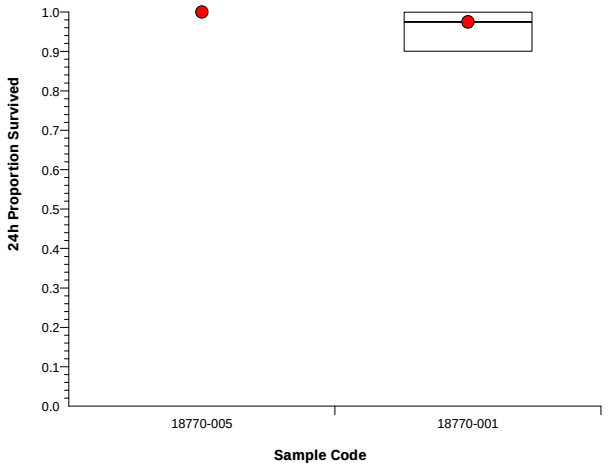
24h Proportion Survived Summary

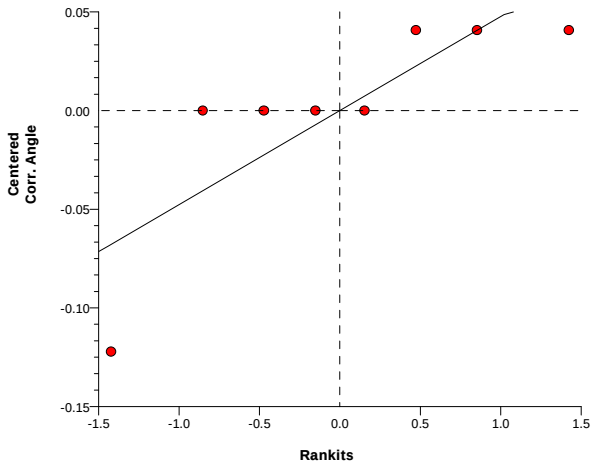
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	03-9607-9833	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

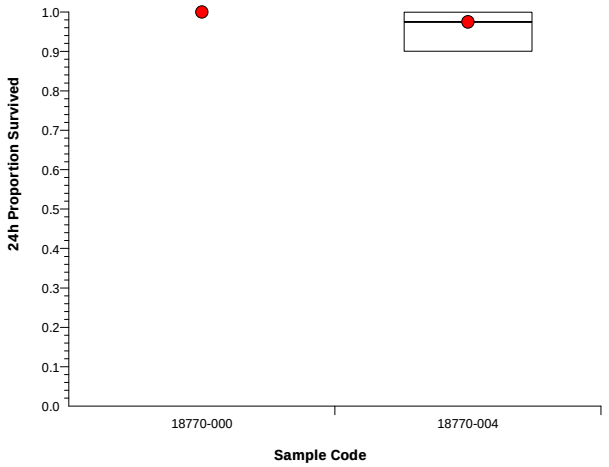
24h Proportion Survived Summary

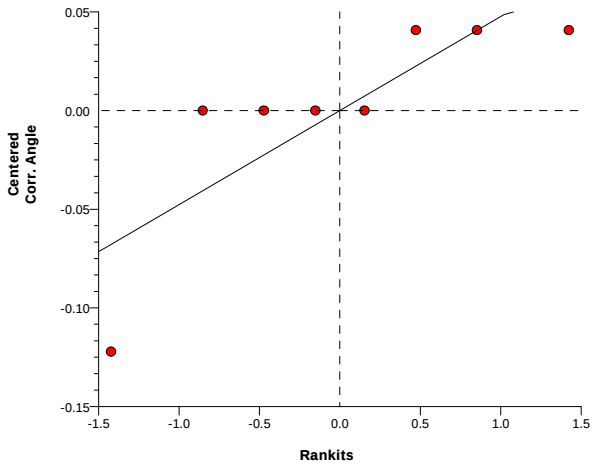
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	11-8632-2466	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

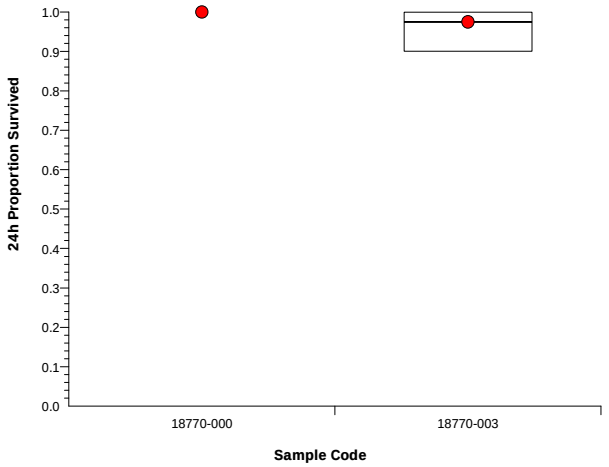
24h Proportion Survived Summary

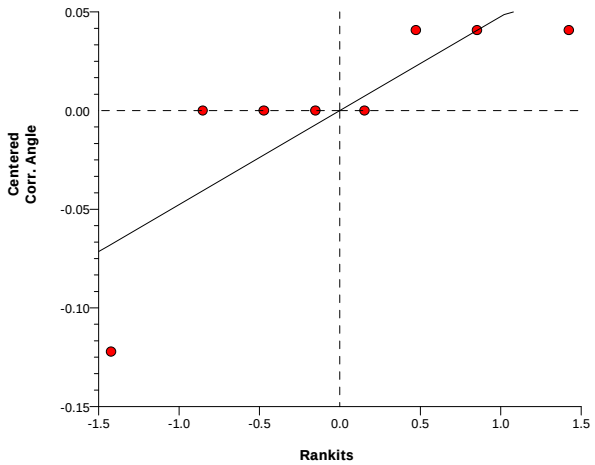
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	11-2256-6280	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

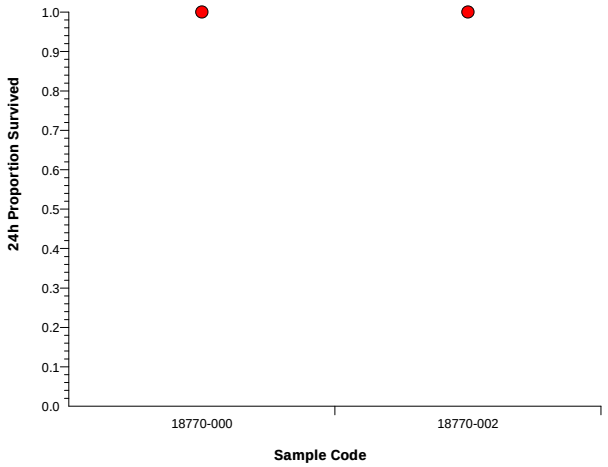
24h Proportion Survived Summary

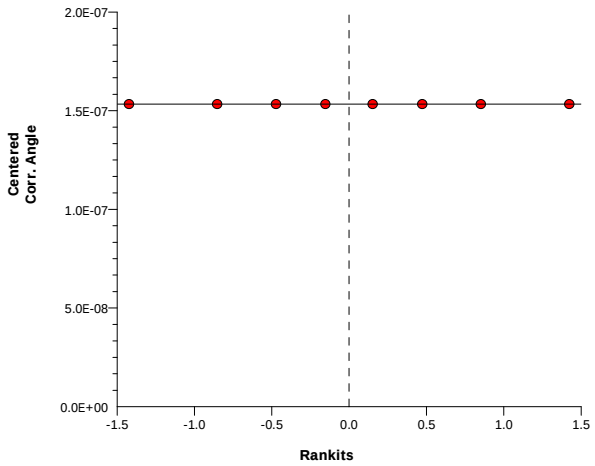
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	04-4072-4585	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

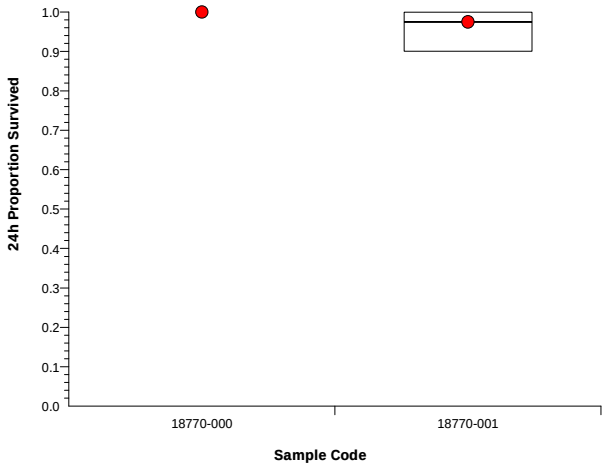
24h Proportion Survived Summary

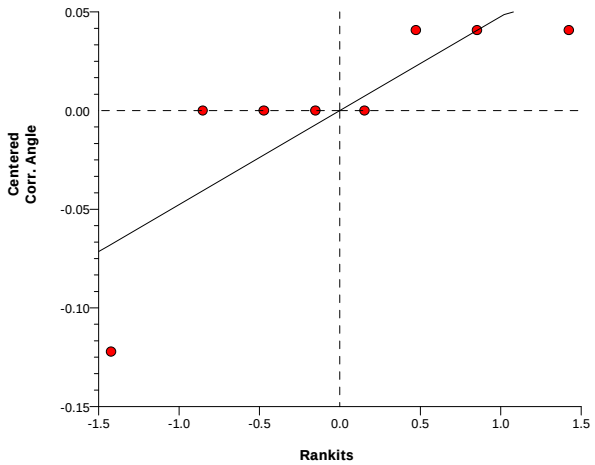
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	19-2609-4608	**Endpoint:**	24h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	24 Jul-09 14:36	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-005	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

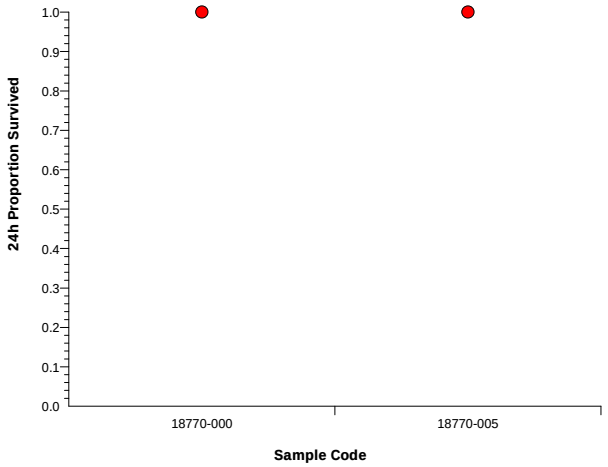
24h Proportion Survived Summary

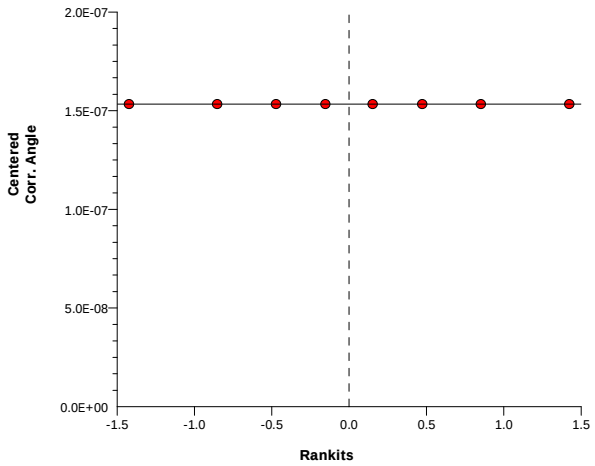
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	09-2386-3109	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

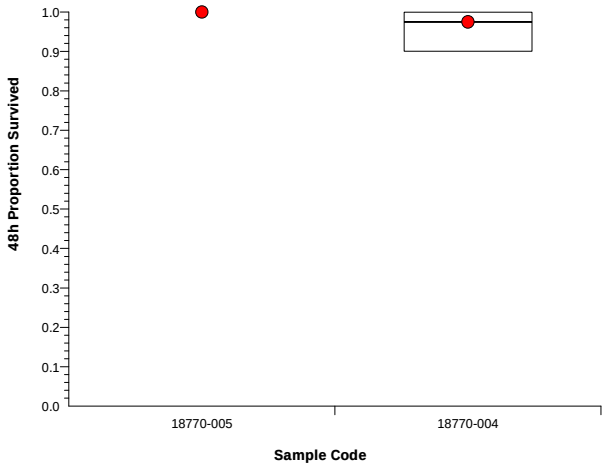
48h Proportion Survived Summary

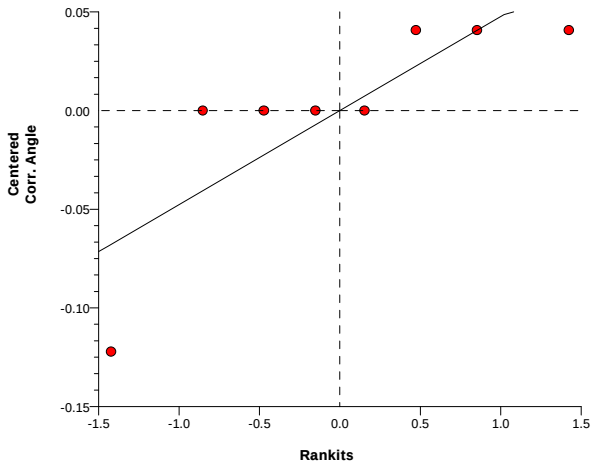
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	20-9989-5516	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

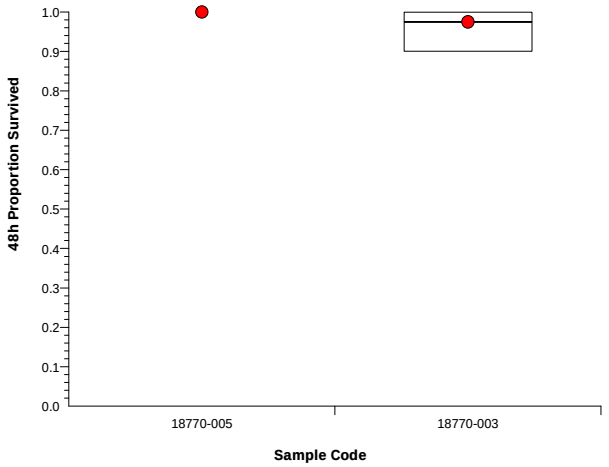
48h Proportion Survived Summary

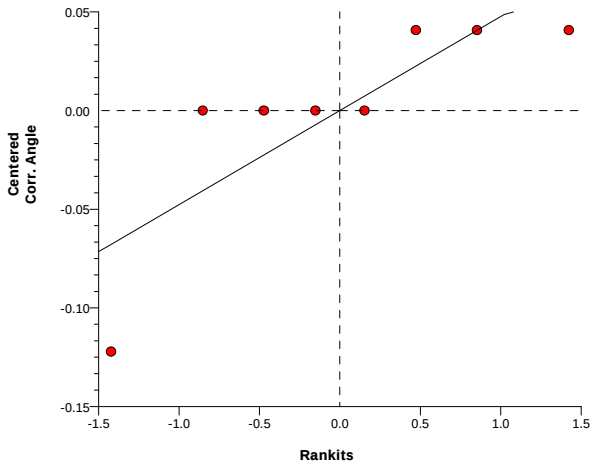
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	11-3419-3984	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

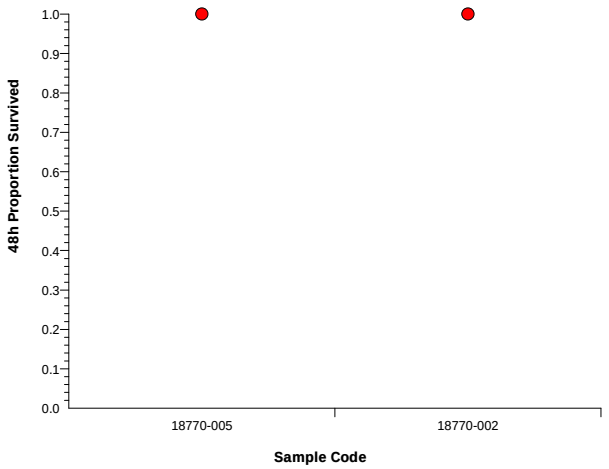
48h Proportion Survived Summary

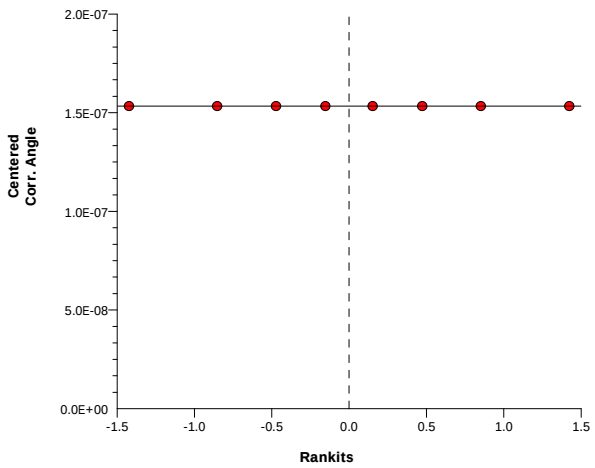
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	04-5963-4047	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

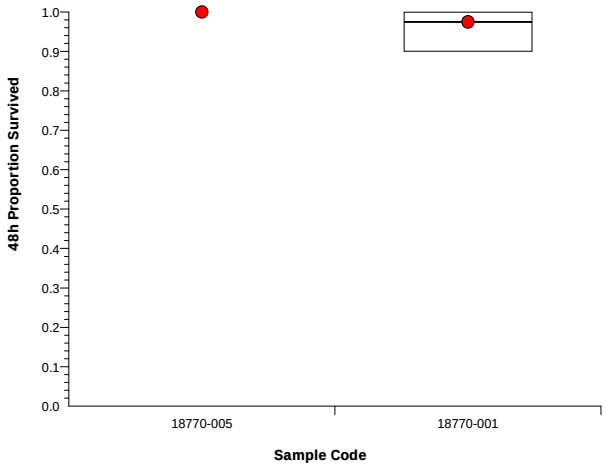
48h Proportion Survived Summary

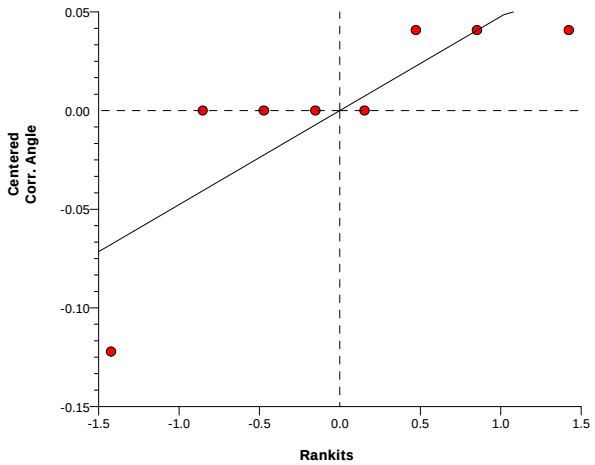
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	17-1499-2035	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-004	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

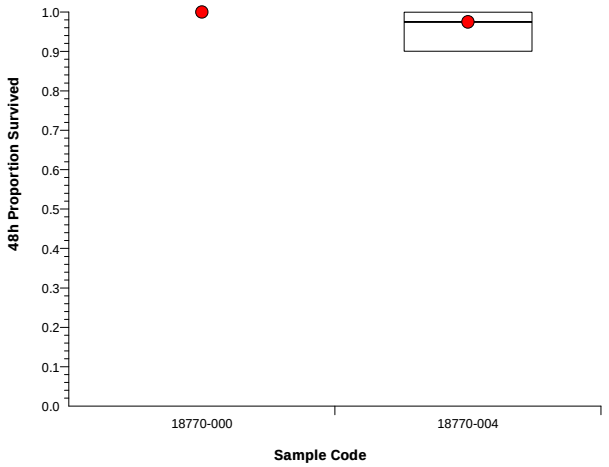
48h Proportion Survived Summary

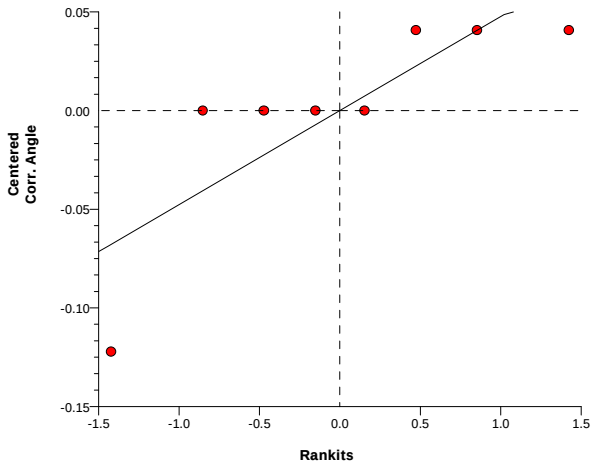
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-004	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-004	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	08-0227-6085	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-003	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

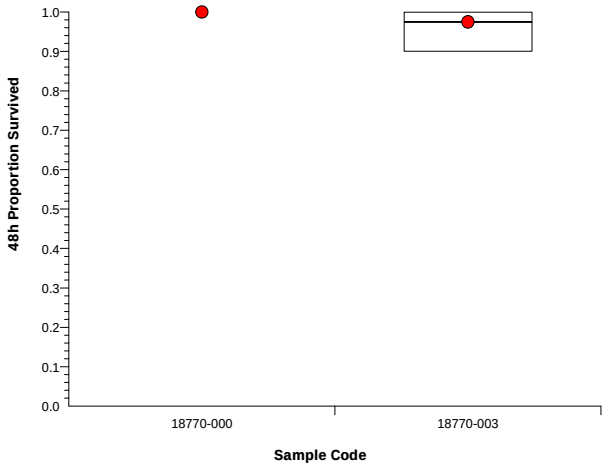
48h Proportion Survived Summary

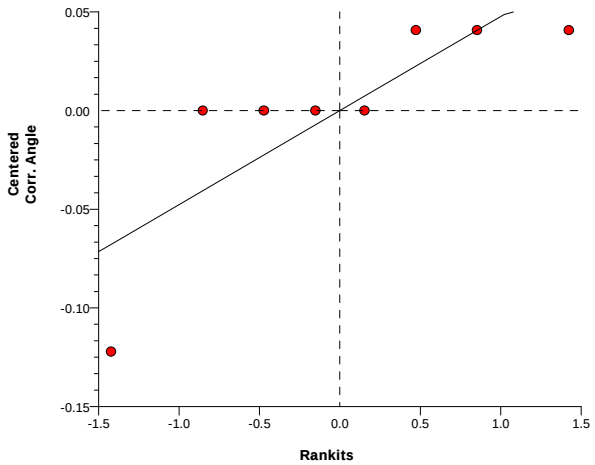
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-003	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-003	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	14-6729-0743	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-002	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

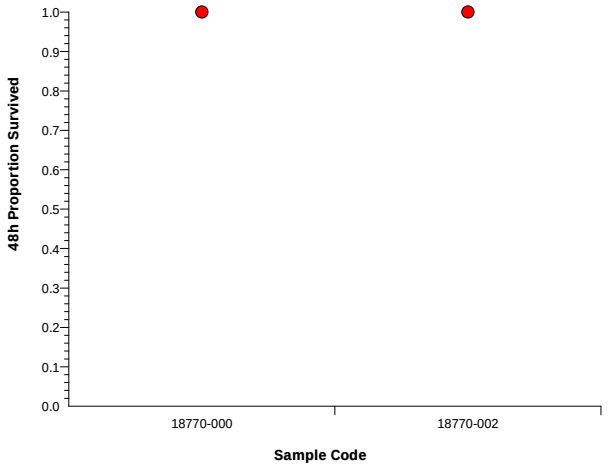
48h Proportion Survived Summary

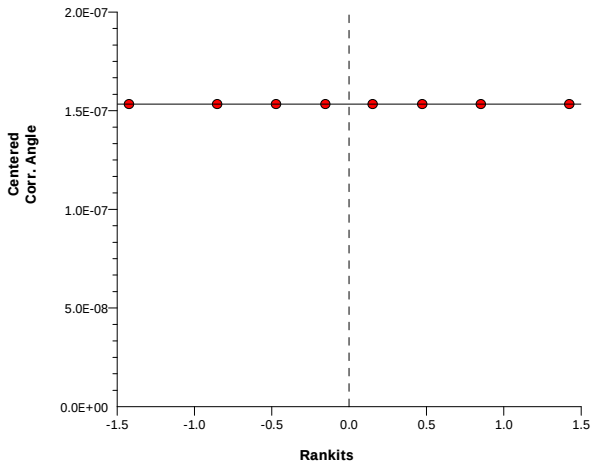
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-002	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-002	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	17-8143-7019	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					5.56%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-001	16		1	0.3429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0033199	0.0033199	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.0033199	6			
Total	0.0232394	0.0066398	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

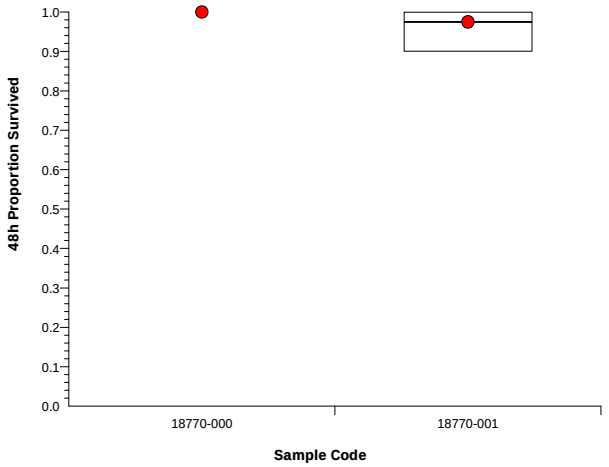
48h Proportion Survived Summary

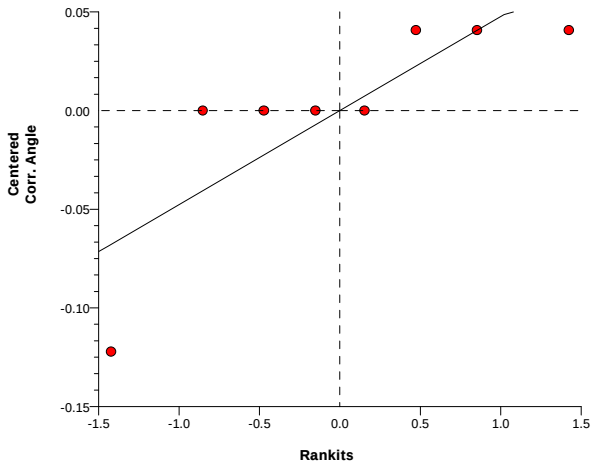
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-001	4	0.975	0.956	0.994	0.9	1	0.009285	0.05	5.13%	2.5%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-001	4	1.371	1.34	1.402	1.249	1.412	0.01513	0.08149	5.94%	2.89%

Graphics





Americamysis 48-Hr Survival Test — **EnviroSystems, Inc.**

Analysis No:	00-2870-5123	**Endpoint:**	48h Proportion Survived	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 10:48	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	13-1803-3614	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	23 Jul-09 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	25 Jul-09 16:00	**Species:**	Americamysis bahia	**Brine:**	Generic commercial salts
Duration:	48h	**Source:**	ARO - Aquatic Research Organisms, NH	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.5%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-005	18		1	0.4429	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	0	0	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

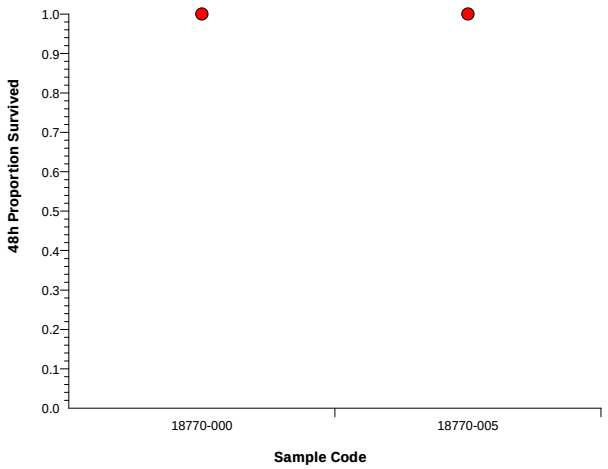
48h Proportion Survived Summary

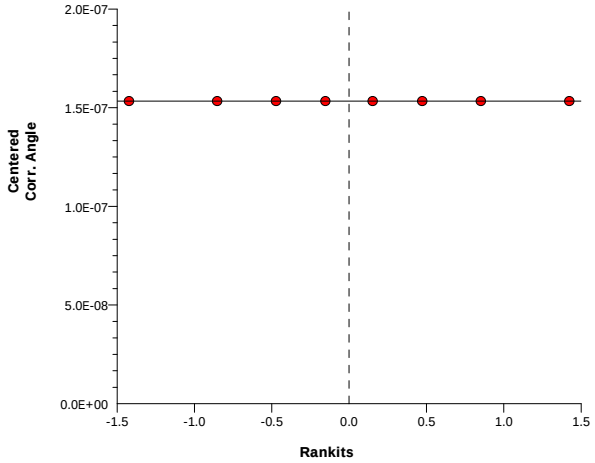
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1	1	1	1	1	0	0	0.0%	0.0%
18770-005	4	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
18770-005	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%

Graphics





Aquatic Research Organisms

7/23

DATA SHEET

I. Organism History

Species Americamysis bahia

Source: Lab reared ✓ Hatchery reared _____ Field collected _____

Hatch date 7-16-09 Receipt date _____

Lot number 071609MS 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: EST # of Organisms 240+

Carrier: _____ Date shipped 7-23-09

Biologist: Mark Thompson

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

Arbacia punctulata Chronic Fertilization Assay
Water Quality and Gamete Preparation Data

STUDY: 18770 (21)8622	CLIENT: Woods Hole Group	LOCATION: New Bedford	DATE: 7/23/09 INITIALS: JO

SALINITY ADJUSTMENT RECORD: 200 mL Ref + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 200 NTU + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 150 NTU + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 100 NTU + _____g SALT

SALINITY ADJUSTMENT RECORD: 200 mL 50 NTU + _____g SALT

SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	7.2	8.11	46.330	~~23~~20	30
Reference Site 005	8.1	7.66	45550	20	29
200 NTU 001	7.4	7.55	46~~8~~740	20	30
150 NTU 002	7.6	7.74	46340	20	30
100 NTU 003	8.4	7.87	47950	20	31
50 NTU 004	8.3	7.77	47660	20	31

METERS USED

DO meter # 23 DO probe # 20 pH meter # 470 pH probe # 85 S/C meter # YSI30D S/C probe # YSI30D

SALINITY meter # YSI30D

DATE & INITIALS FOR GAMETE PREPARATION: LB

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 1 22 X 10^4 = SPM SOLUTION E = 1.22×10^6

SPERM CONCENTRATIONS:
SOLUTION E X 40 = SOLUTION A = 4.88×10^7 SPM
SOLUTION E X 20 = SOLUTION B = 2.44×10^7 SPM
SOLUTION E X 5 = SOLUTION C = 6.10×10^6 SPM

FINAL COUNTS:

FINAL SPERM COUNT: 4.88×10^7
FINAL EGG COUNT: 2400

TEST TIMES:

SPERM COLLECTED: 1345
EGGS COLLECTED: 1345
SPERM ADDED: 1425
EGGS ADDED: 1525
FIXATIVE ADDED: 1545

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: ~~18622~~ 18770	CLIENT: Woods Hole Group New Bedford
SPECIES: *A. punctulata*	

	Day: 0	
SAMPLE	Volume Used (mL)	ESI Cube ID
Lab Control	200 mL	—
Reference Site 005		005
200 NTU 001		001
150 NTU 002		002
100 NTU 003		003
50 NTU 004		004
INITIALS:	SJ	
TIME:	1405	
DATE:	7/23/09	

FERTILIZATION COUNTS

STUDY 18770	CLIENT Woods Hole Group	LOCATION New Bedford	DATE 7/23/09 INITIALS UB

	REPLICATE VIAL			
	1	2	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100/101	103/104	100/101	100/100
005 Reference	101/101	101/101	109/111	101/103
001 200 NTU	101/108	100/108	100/108	100/104
002 150 NTU	88/100	108/119	98/106	90/100
003 100 NTU	100/106	103/104	102/102	100/101
004 50 NTU	100/102	100/101	97/100	98/100

CETIS Summary Report

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

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18770-000	06-7167-7012	23 Jul-09 12:00	23 Jul-09 12:00	2h	Woods Hole Group	Ecological Risk Assessme
18770-005	03-9927-1818	22 Jul-09 09:49	22 Jul-09 17:47	29h		
18770-001	15-6024-8561	22 Jul-09 08:26	22 Jul-09 17:47	30h		
18770-002	05-1145-9131	22 Jul-09 09:52	22 Jul-09 17:47	29h		
18770-003	01-6638-4937	22 Jul-09 09:51	22 Jul-09 17:47	29h		
18770-004	06-1076-1745	22 Jul-09 09:51	22 Jul-09 17:47	29h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18770-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18770-005	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-005-072209 (Reference		
18770-001	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-001-072209 (190 NTU)		
18770-002	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-002-072209 (140 NTU)		
18770-003	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-003-072209 (110 NTU)		
18770-004	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-004-072209 (092 NTU)		

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptabilty Limits	Overlap	Decision
06-7656-2976	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
09-6737-1504	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
10-6690-2820	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
11-5470-6168	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
17-7985-6300	Proportion Fertilized	Control Resp	0.988	0.7 - 1	Yes	Passes acceptability criteria
01-1516-8347	Proportion Fertilized	PMSD	0.01443	NL - 0.25	No	Passes acceptability criteria
06-7656-2976	Proportion Fertilized	PMSD	0.01384	NL - 0.25	No	Passes acceptability criteria
09-5020-8784	Proportion Fertilized	PMSD	0.01346	NL - 0.25	No	Passes acceptability criteria
09-6737-1504	Proportion Fertilized	PMSD	0.01371	NL - 0.25	No	Passes acceptability criteria
10-6690-2820	Proportion Fertilized	PMSD	0.01489	NL - 0.25	No	Passes acceptability criteria
11-5470-6168	Proportion Fertilized	PMSD	0.02683	NL - 0.25	No	Passes acceptability criteria
13-5798-4253	Proportion Fertilized	PMSD	0.01335	NL - 0.25	No	Passes acceptability criteria
16-0058-2404	Proportion Fertilized	PMSD	0.02555	NL - 0.25	No	Passes acceptability criteria
17-7985-6300	Proportion Fertilized	PMSD	0.0178	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%
18770-000	4	0.988	0.9836	0.9924	0.9717	1	0.002157	0.01181	1.2%	0.0%
18770-005	4	0.9906	0.9866	0.9947	0.9806	1	0.001976	0.01082	1.09%	-0.27%
18770-001	4	0.9371	0.9309	0.9434	0.9259	0.9615	0.003074	0.01684	1.8%	5.14%
18770-002	4	0.903	0.8961	0.9099	0.88	0.9245	0.00337	0.01846	2.04%	8.6%
18770-003	4	0.981	0.9715	0.9905	0.9434	1	0.00465	0.02547	2.6%	0.71%
18770-004	4	0.9801	0.9771	0.9832	0.97	0.9901	0.001498	0.008207	0.84%	0.79%

Proportion Fertilized Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	0.9901	0.9717	0.9901	1
18770-005	1	1	0.982	0.9806
18770-001	0.9352	0.9259	0.9259	0.9615
18770-002	0.88	0.9076	0.9245	0.9
18770-003	0.9434	0.9904	1	0.9901
18770-004	0.9804	0.9901	0.97	0.98

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

Analysis No:	13-5798-4253	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.33%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-004	1.543	1.943	0.05734	0.0869	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0041475	0.0041475	1	2.382	0.1737	Non-Significant Effect
Error	0.0104487	0.0017415	6			
Total	0.0145962	0.005889	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.747	47.47	0.4286	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8533		0.1030	Normal Distribution

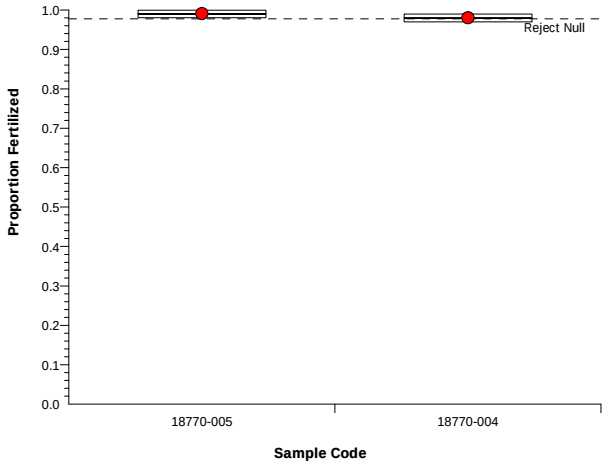
Proportion Fertilized Summary

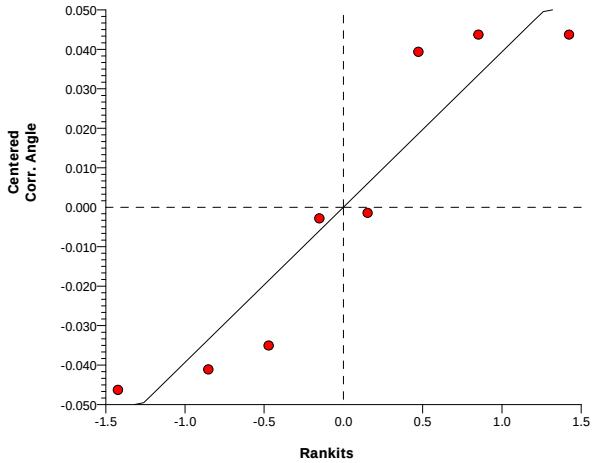
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-004	4	0.9801	0.977	0.9832	0.97	0.9901	0.001524	0.008207	0.84%	1.06%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-004	4	1.432	1.42	1.443	1.397	1.471	0.005661	0.03049	2.13%	3.08%

Graphics





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

Analysis No:	16-0058-2404	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.56%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-003	0.5887	1.943	0.09379	0.2888	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0016145	0.0016145	1	0.3465	0.5776	Non-Significant Effect
Error	0.0279527	0.0046588	6			
Total	0.0295672	0.0062732	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.649	47.47	0.4448	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9021		0.3020	Normal Distribution

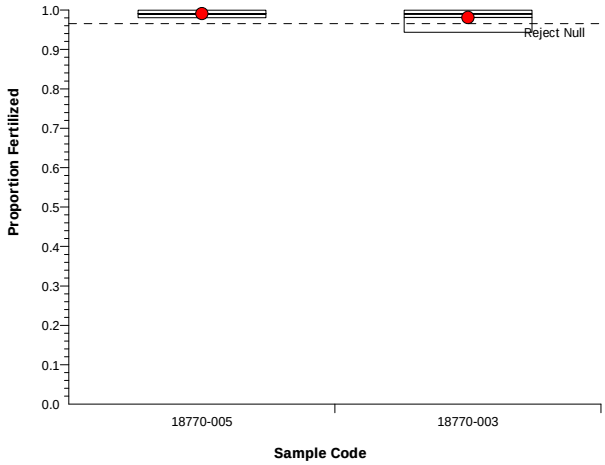
Proportion Fertilized Summary

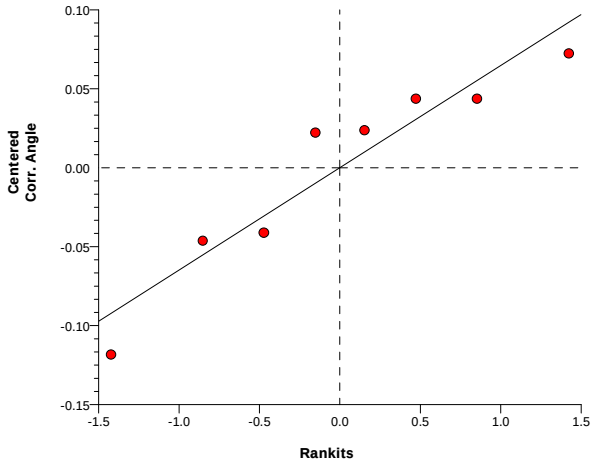
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-003	4	0.981	0.9713	0.9907	0.9434	1	0.004729	0.02547	2.6%	0.98%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-003	4	1.449	1.418	1.48	1.331	1.521	0.01527	0.08224	5.68%	1.92%

Graphics





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

Analysis No:	09-5020-8784	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.35%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-002	7.48	1.943	0.05772	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0987307	0.0987307	1	55.94	0.0003	Significant Effect
Error	0.0105888	0.0017648	6			
Total	0.1093195	0.1004955	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.616	47.47	0.4506	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8568		0.1116	Normal Distribution

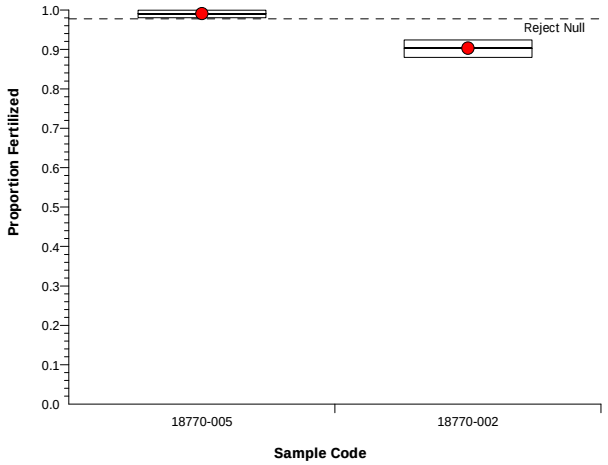
Proportion Fertilized Summary

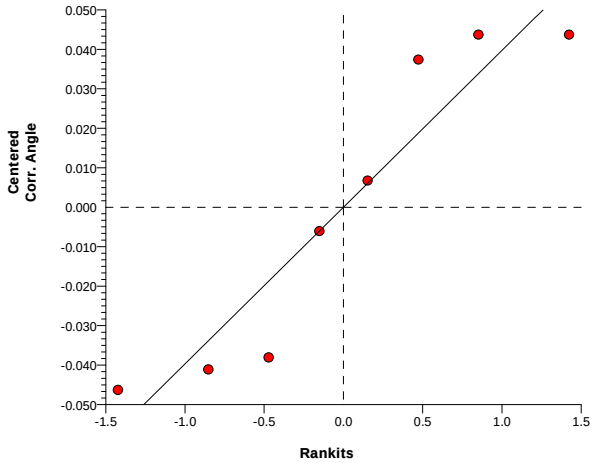
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-002	4	0.903	0.896	0.91	0.88	0.9245	0.003428	0.01846	2.04%	8.84%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-002	4	1.255	1.243	1.267	1.217	1.292	0.005802	0.03124	2.49%	15.04%

Graphics





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

Analysis No:	01-1516-8347	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.44%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-001	5.042	1.943	0.0609	0.0012	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0499467	0.0499467	1	25.42	0.0024	Significant Effect
Error	0.0117884	0.0019647	6			
Total	0.0617352	0.0519115	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.856	47.47	0.6243	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8572		0.1125	Normal Distribution

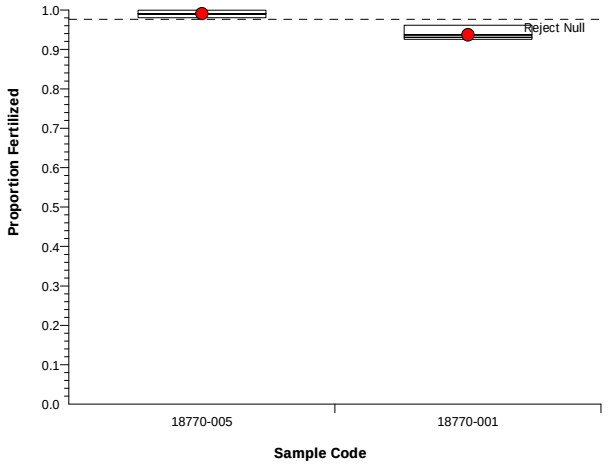
Proportion Fertilized Summary

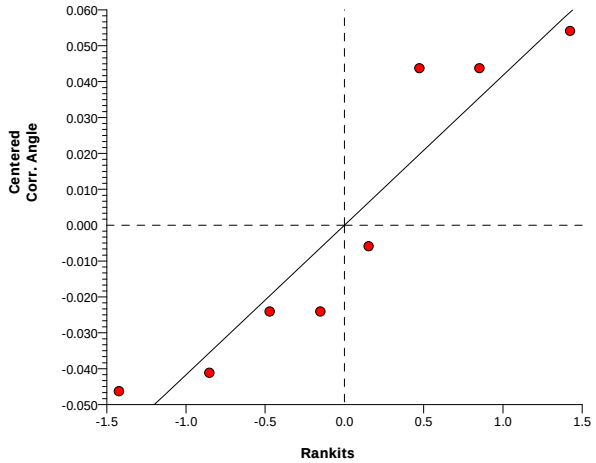
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	0.0%
18770-001	4	0.9371	0.9307	0.9435	0.9259	0.9615	0.003127	0.01684	1.8%	5.4%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	0.0%
18770-001	4	1.319	1.305	1.333	1.295	1.373	0.006888	0.0371	2.81%	10.7%

Graphics





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

Analysis No:	09-6737-1504	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.37%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-004	1.195	1.943	0.056	0.1386	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0023717	0.0023717	1	1.428	0.2772	Non-Significant Effect
Error	0.0099678	0.0016613	6			
Total	0.0123395	0.0040330	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.575	47.47	0.4578	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9493		0.7039	Normal Distribution

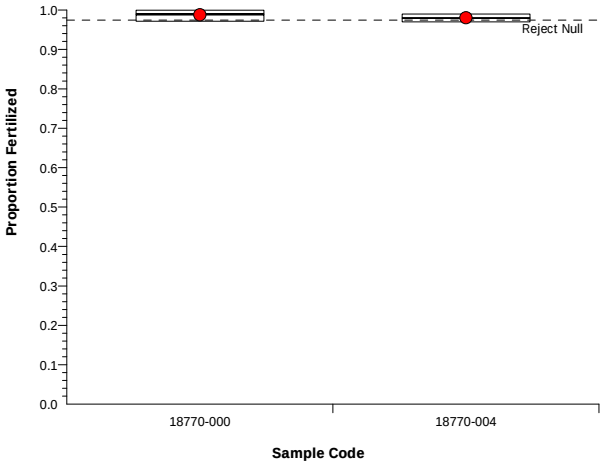
Proportion Fertilized Summary

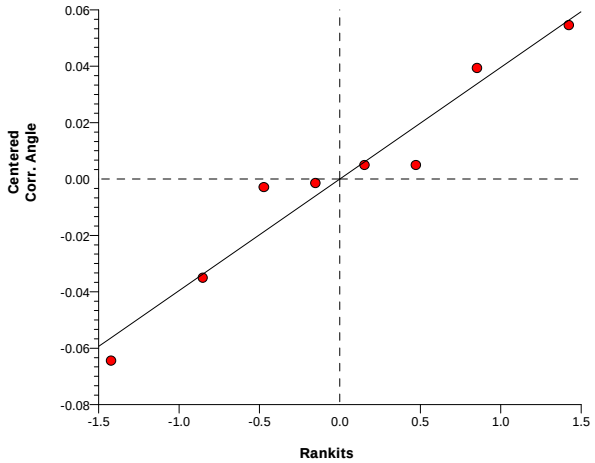
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-004	4	0.9801	0.977	0.9832	0.97	0.9901	0.001524	0.008207	0.84%	0.79%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-004	4	1.432	1.42	1.443	1.397	1.471	0.005661	0.03049	2.13%	2.35%

Graphics





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

Analysis No:	11-5470-6168	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					2.68%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-003	0.3618	1.943	0.09297	0.3650	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0005992	0.0005992	1	0.1309	0.7299	Non-Significant Effect
Error	0.0274718	0.0045786	6			
Total	0.0280710	0.0051779	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.826	47.47	0.4162	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9005		0.2922	Normal Distribution

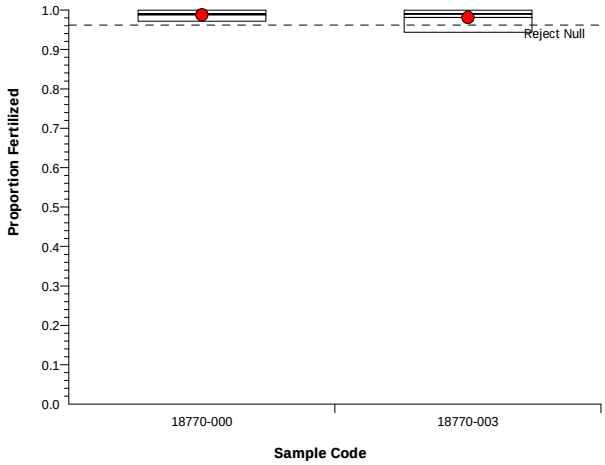
Proportion Fertilized Summary

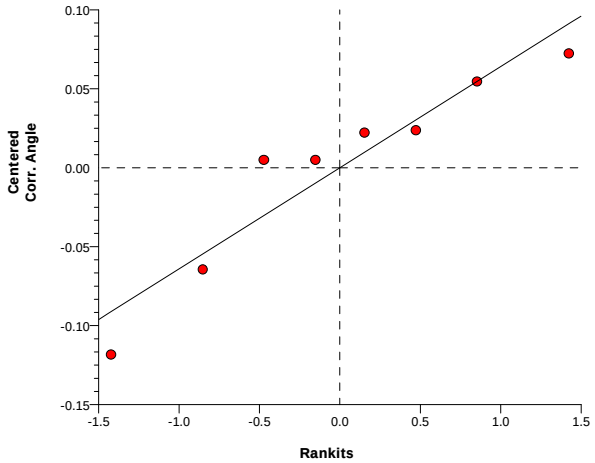
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-003	4	0.981	0.9713	0.9907	0.9434	1	0.004729	0.02547	2.6%	0.71%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-003	4	1.449	1.418	1.48	1.331	1.521	0.01527	0.08224	5.68%	1.18%

Graphics





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

Analysis No:	06-7656-2976	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.38%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-002	7.273	1.943	0.0564	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0891102	0.0891102	1	52.9	0.0003	Significant Effect
Error	0.0101079	0.0016847	6			
Total	0.0992181	0.0907948	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.452	47.47	0.4808	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9525		0.7360	Normal Distribution

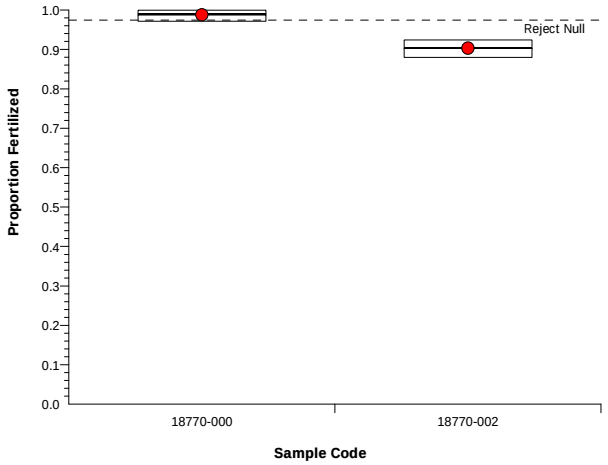
Proportion Fertilized Summary

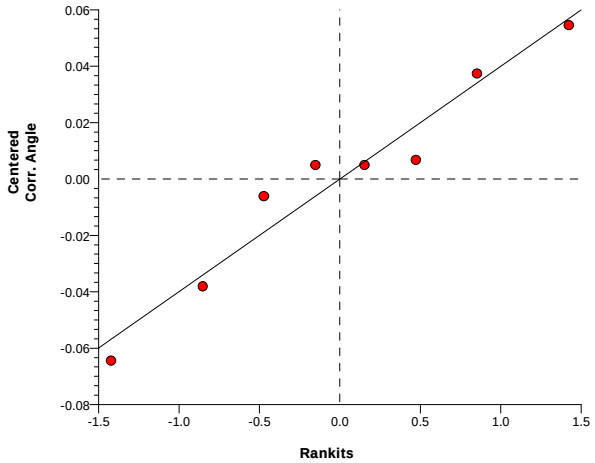
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-002	4	0.903	0.896	0.91	0.88	0.9245	0.003428	0.01846	2.04%	8.6%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-002	4	1.255	1.243	1.267	1.217	1.292	0.005802	0.03124	2.49%	14.4%

Graphics





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

Analysis No:	10-6690-2820	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.49%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-001	4.786	1.943	0.05965	0.0015	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0431752	0.0431752	1	22.91	0.0030	Significant Effect
Error	0.0113076	0.0018846	6			
Total	0.0544828	0.0450598	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.739	47.47	0.6606	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9284		0.5015	Normal Distribution

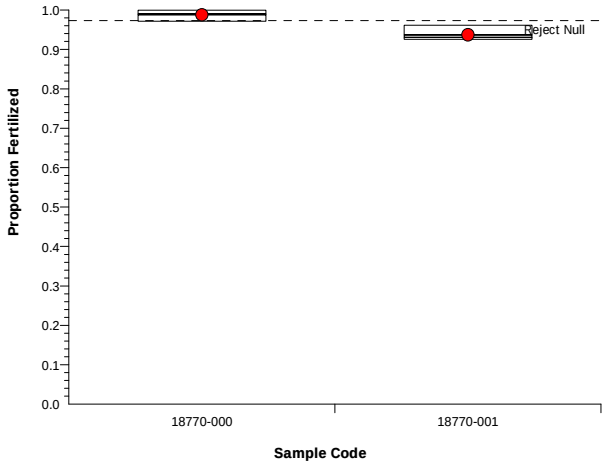
Proportion Fertilized Summary

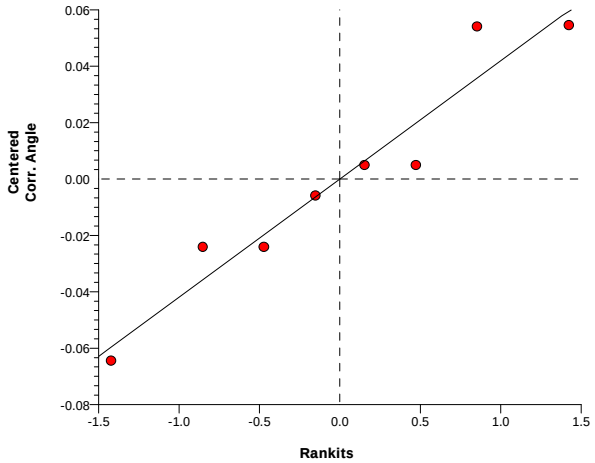
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-001	4	0.9371	0.9307	0.9435	0.9259	0.9615	0.003127	0.01684	1.8%	5.14%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-001	4	1.319	1.305	1.333	1.295	1.373	0.006888	0.0371	2.81%	10.02%

Graphics





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

Analysis No:	17-7985-6300	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.6.4
Analyzed:	23 Jul-09 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	08-3312-6536	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	23 Jul-09 14:25	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Not Applicable
Ending Date:	23 Jul-09 15:45	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)		C > T	Not Run					1.78%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-005	-0.3157	1.943	0.06833	0.6185	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0002465	0.0002465	1	0.09968	0.7629	Non-Significant Effect
Error	0.0148398	0.0024733	6			
Total	0.0150863	0.0027198	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.067	47.47	0.9587	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8966		0.2691	Normal Distribution

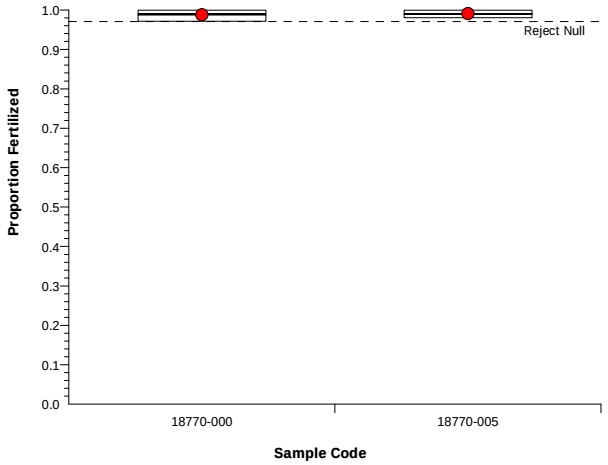
Proportion Fertilized Summary

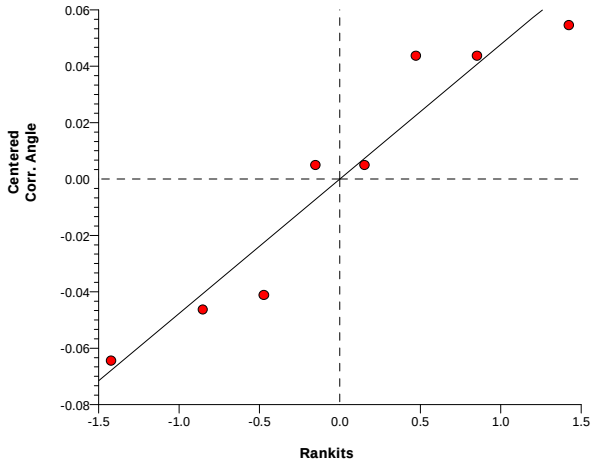
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	0.988	0.9835	0.9925	0.9717	1	0.002194	0.01181	1.2%	0.0%
18770-005	4	0.9906	0.9865	0.9948	0.9806	1	0.00201	0.01082	1.09%	-0.27%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	1.466	1.448	1.485	1.402	1.521	0.009084	0.04892	3.34%	0.0%
18770-005	4	1.477	1.458	1.497	1.431	1.521	0.009383	0.05053	3.42%	-0.76%

Graphics





STUDY NUMBER: 18770 CLIENT: Woods Hole ~~NBH~~ EFFLUENT: 001,002,003,004,005

DATE: 7/24/09 TECHNICIAN: UB

100% Effluent As Received Water Qualities:

Salinity 23.2 (09) pH 7.27 S/C _____ TRC _____

002 19.0 7.37
003 17.5 7.40
004 21.5 7.54
005 21.4 7.54

Salinity Adjustment Record:

1000 mL Effluent + 7.88 (08) g Sea Salts -or- mL Spring Water (Circle One)

13
14
10
3

Bottles Pulled:

Effluent: AMM ☐ TS/S ☐ TOC ☐ // Diluent: AMM ☐ TS/S ☐ TOC ☐

DILUTIONS

STUDY: 18770	CLIENT: (EWING) ~~ENSR~~ - New Bedford	
SPECIES: *C. parvula*		
Diluent: Lab Salt	Day: 0 Start Sample: 001, 002, 003, 004, 005	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
(ED) Lab	800	800
~~6.25%~~ 001	↓	↓
~~12.5%~~ 002		
~~25%~~ 003		
~~50%~~ 004		
~~100%~~ 005		
INITIALS:	UB	
TIME:	1405	
DATE:	7/24/09	

Champia parvula Plant Viability Summary

STUDY NUMBER: 18770 ASSAY START: 07/24/09 ASSAY END: 07/26/09

REP/Branch	CONTROL	001	002	003	004	005
A 1	4	0	1	2	3	3
2	|	0	1	2	3	3
3	|	0	1	2	3	4
4	|	0	0	2	2	3
5	↓	0	1	2	3	3
B 1	4	0	1	2	3	4
2	|	0	1	2	3	3
3	|	0	0	2	3	4
4	|	0	1	2	3	3
5	↓	0	1	2	3	3
C 1	4	0	1	1	3	3
2	4	0	1	2	2	3
3	4	0	1	2	3	3
4	4	0	1	2	3	3
5	4	0	1	2	3	3
D 1	4	0	0	2	3	3
2	4	0	1	2	3	3
3	4	0	1	2	3	4
4	4	0	1	2	3	3
5	4	0	0	2	3	3
SALINITY	28	30	29	31	30	30
pH (SU)	8.08	7.50	7.65	7.73	7.70	7.65
S/C (µmhos)	45500	46000	45070	48670	46500	46320
TEMP (°C	24					
TRC	<0.02					—

pH meter# 1097 pH probe# 93 S/C meter# 3 S/C probe# 82 Salinity meter# YSI 30D

Scoring for Acute Assay Endpoint - Plant Health/Viability

SCORE	Description
4	Plants with good color and no signs of degeneration
3	Color faded - some sign of bleaching color light red to pink; no branch tip degeneration
2	Color faded - light pink; no green, yellow or white branch tips; no branch tip degeneration
1	Color yellow to white; no branch tip degeneration
0	Color limited to white; signs of branch tip degeneration

Technician Initials : DMB/LB

Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**	Saskatchewan Research Council	**Age:**	

Sample Code	Sample No	Sample Date	Receive Date	Sample Age	Client Name	Project
18770-000	06-7167-7012	23 Jul-09 12:00	23 Jul-09 12:00	27h	Woods Hole Group	Ecological Risk Assessme
18770-005	03-9927-1818	22 Jul-09 09:49	22 Jul-09 17:47	54h		
18770-001	15-6024-8561	22 Jul-09 08:26	22 Jul-09 17:47	55h		
18770-002	05-1145-9131	22 Jul-09 09:52	22 Jul-09 17:47	54h		
18770-003	01-6638-4937	22 Jul-09 09:51	22 Jul-09 17:47	54h		
18770-004	06-1076-1745	22 Jul-09 09:51	22 Jul-09 17:47	54h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
18770-000	Surface Water	New Bedford Harbor Dredge Moni	Laboratory Water Control		
18770-005	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-005-072209 (Reference		
18770-001	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-001-072209 (190 NTU)		
18770-002	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-002-072209 (140 NTU)		
18770-003	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-003-072209 (110 NTU)		
18770-004	Surface Water	New Bedford Harbor Dredge Moni	DS-TOX-004-072209 (092 NTU)		

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-005	4	3.2	3.139	3.261	3	3.4	0.02981	0.1633	5.1%	20.0%
18770-001	4	0	0	0	0	0	0	0		100.0%
18770-002	4	0.8	0.739	0.861	0.6	1	0.02981	0.1633	20.41%	80.0%
18770-003	4	1.95	1.913	1.987	1.8	2	0.01826	0.1	5.13%	51.25%
18770-004	4	2.9	2.857	2.943	2.8	3	0.02108	0.1155	3.98%	27.5%

Mean ~~Cystocarps Detail~~ Branch Viability Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
18770-000	4	4	4	4
18770-005	3.2	3.4	3	3.2
18770-001	0	0	0	0
18770-002	0.8	0.8	1	0.6
18770-003	2	2	1.8	2
18770-004	2.8	3	2.8	3

Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	07-2840-3294	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					6.07%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-004	3	1.943	0.1943	0.0120	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.18	0.18	1	9	0.0240	Significant Effect
Error	0.12	0.02	6			
Total	0.3	0.2	7			

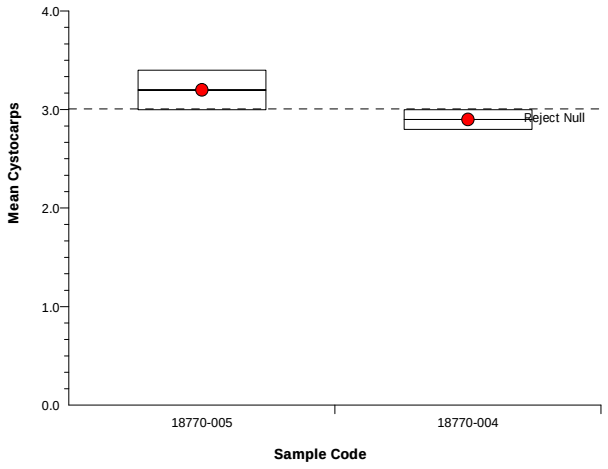
ANOVA Assumptions

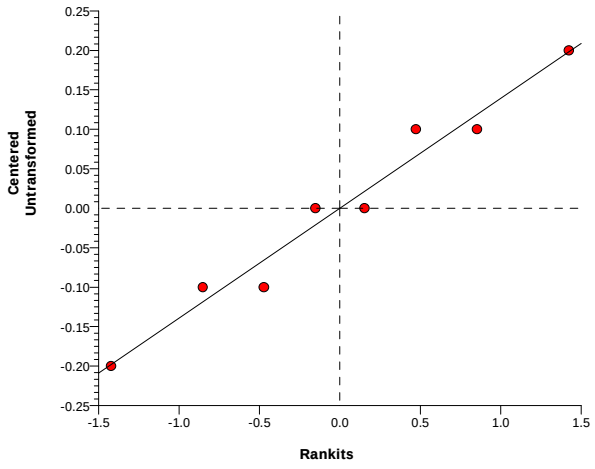
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2	47.47	0.5836	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9651		0.8568	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-004	4	2.9	2.856	2.944	2.8	3	0.02144	0.1155	3.98%	9.38%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	08-4729-3241	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					5.81%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-003	13.06	1.943	0.186	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.125	3.125	1	170.5	0.0000	Significant Effect
Error	0.11	0.0183333	6			
Total	3.235	3.143333	7			

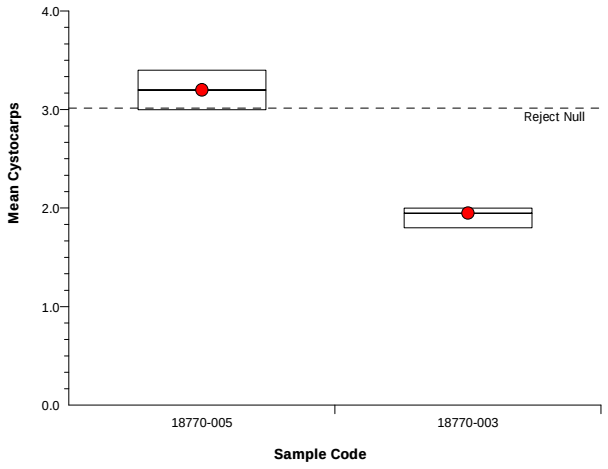
ANOVA Assumptions

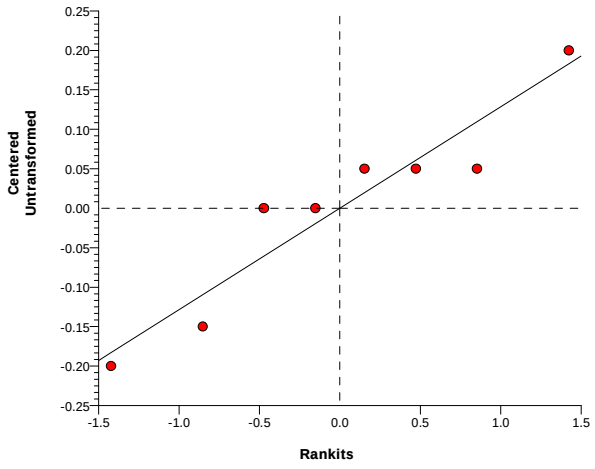
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.667	47.47	0.4419	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9128		0.3739	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-003	4	1.95	1.912	1.988	1.8	2	0.01857	0.1	5.13%	39.06%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	17-5710-5878	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					7.01%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-005		18770-002	20.78	1.943	0.2244	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	11.52	11.52	1	432	0.0000	Significant Effect
Error	0.16	0.0266667	6			
Total	11.68	11.54667	7			

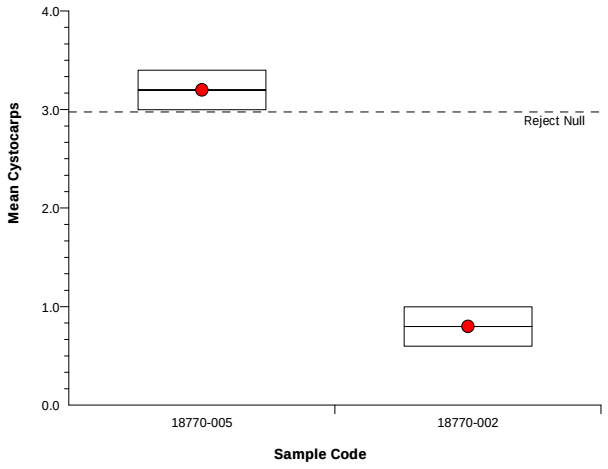
ANOVA Assumptions

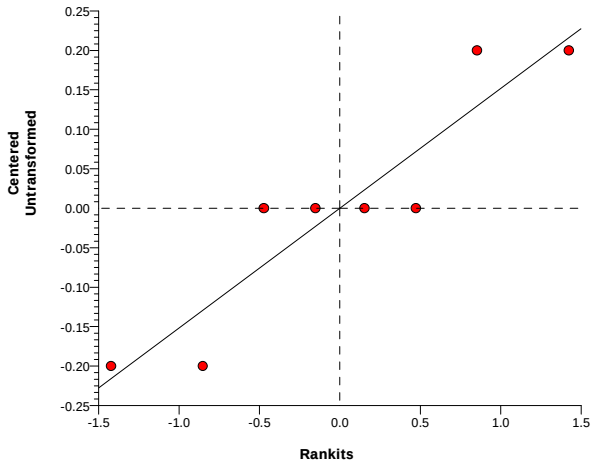
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1	47.47	1.0000	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8489		0.0929	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-002	4	0.8	0.7379	0.8621	0.6	1	0.03032	0.1633	20.41%	75.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	02-0675-1624	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					4.96%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-005		18770-001	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	20.48	20.48	1	1536	0.0000	Significant Effect
Error	0.08	0.0133333	6			
Total	20.56	20.49333	7			

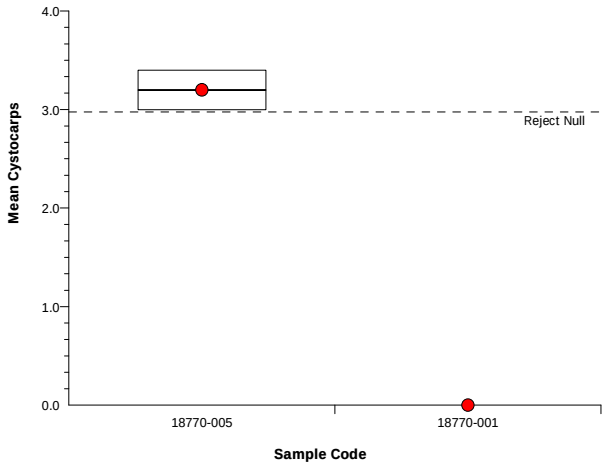
ANOVA Assumptions

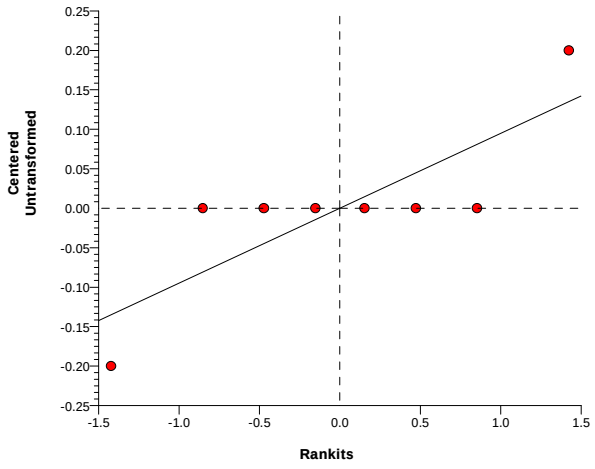
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7322		0.0052	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	0.0%
18770-001	4	0	0	0	0	0	0	0		100.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	16-1616-7438	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					2.8%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
18770-000		18770-004	19.05	1.943	0.1122	0.0000	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.42	2.42	1	363	0.0000	Significant Effect
Error	0.04	0.0066667	6			
Total	2.46	2.426667	7			

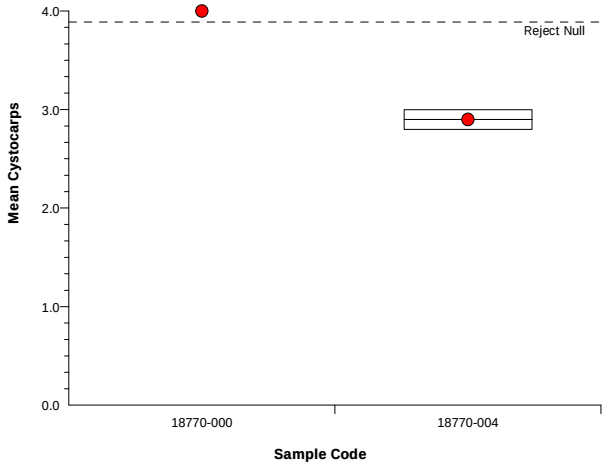
ANOVA Assumptions

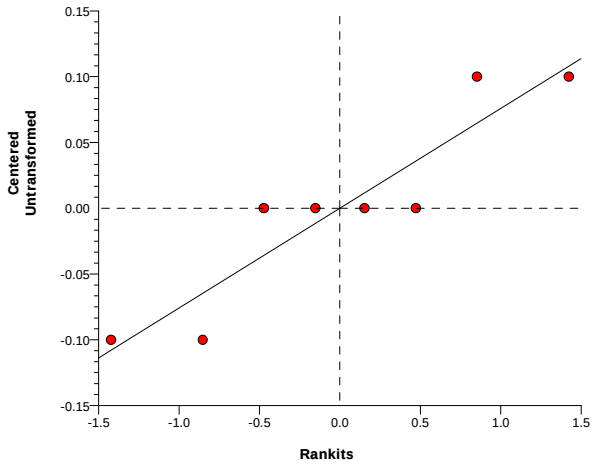
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8489		0.0929	Normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-004	4	2.9	2.856	2.944	2.8	3	0.02144	0.1155	3.98%	27.5%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	20-3632-1340	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					2.43%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-003	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	8.405	8.405	1	1681	0.0000	Significant Effect
Error	0.03	0.005	6			
Total	8.434999	8.41	7			

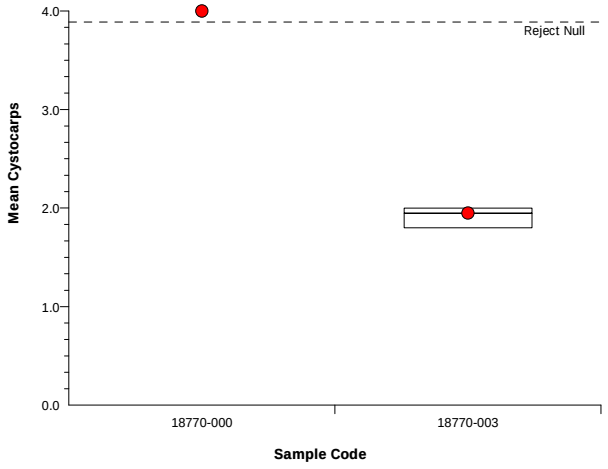
ANOVA Assumptions

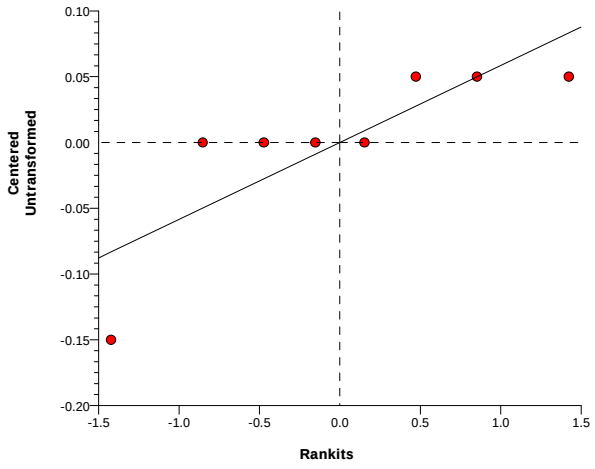
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	1	13.75	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7065		0.0027	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-003	4	1.95	1.912	1.988	1.8	2	0.01857	0.1	5.13%	51.25%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	21-0469-8663	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					3.97%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-002	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	20.48	20.48	1	1536	0.0000	Significant Effect
Error	0.08	0.0133333	6			
Total	20.56	20.49333	7			

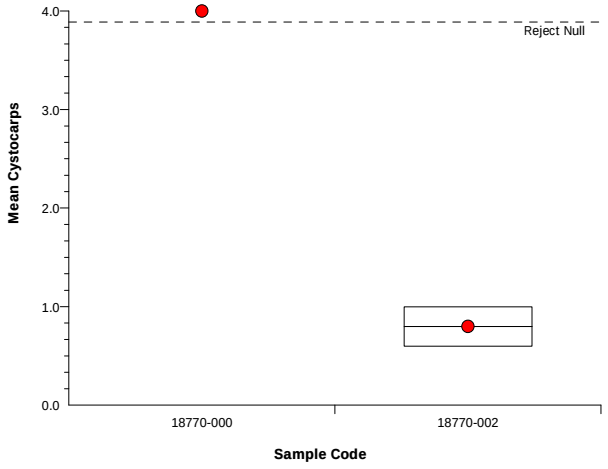
ANOVA Assumptions

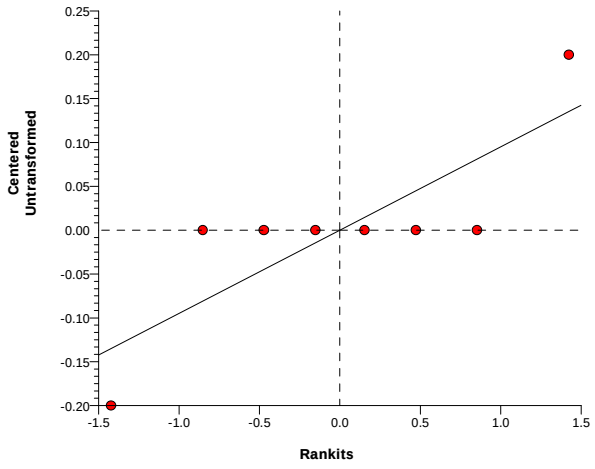
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7322		0.0052	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-002	4	0.8	0.7379	0.8621	0.6	1	0.03032	0.1633	20.41%	80.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	10-2051-9019	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					0.0%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-001	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	32	32	1	65540	0.0000	Significant Effect
Error	0	0	6			
Total	32	32	7			

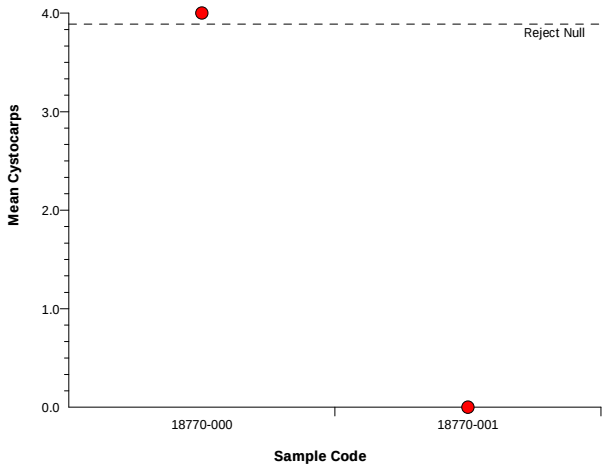
ANOVA Assumptions

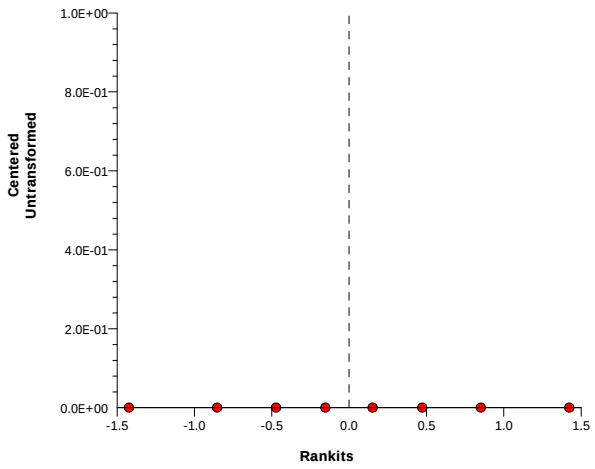
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	65540	13.75	0.0000	Unequal Variances

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-001	4	0	0	0	0	0	0	0		100.0%

Graphics





Champia parvula Red Macroalga Sexual Reproduction Test Branch Tip Viability Endpoint **EnviroSystems, Inc.**

Analysis No:	21-2050-8151	**Endpoint:**	~~Mean Cystocarps~~ Plant Viability	**CETIS Version:**	CETISv1.6.4
Analyzed:	27 Jul-09 11:00	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Test Run No:	15-5181-9457	**Test Type:**	Champia	**Analyst:**	
Start Date:	24 Jul-09 15:25	**Protocol:**	EPA/600/4-91/003 (1994)	**Diluent:**	Not Applicable
Ending Date:	26 Jul-09 17:45	**Species:**	Champia parvula	**Brine:**	Not Applicable
Duration:	50h	**Source:**		**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run					3.97%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
18770-000		18770-005	10		0	0.0143	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.28	1.28	1	96	0.0001	Significant Effect
Error	0.08	0.0133333	6			
Total	1.36	1.293333	7			

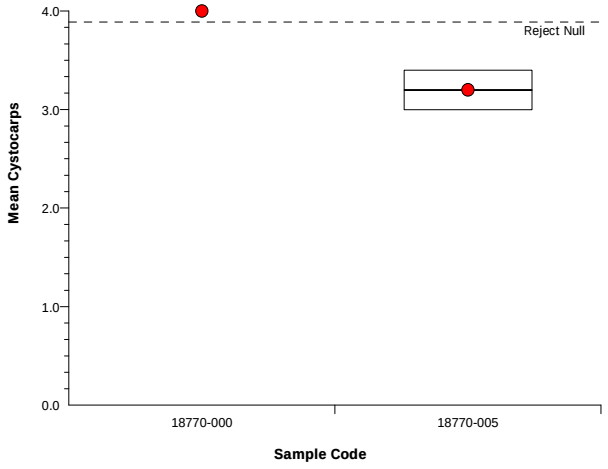
ANOVA Assumptions

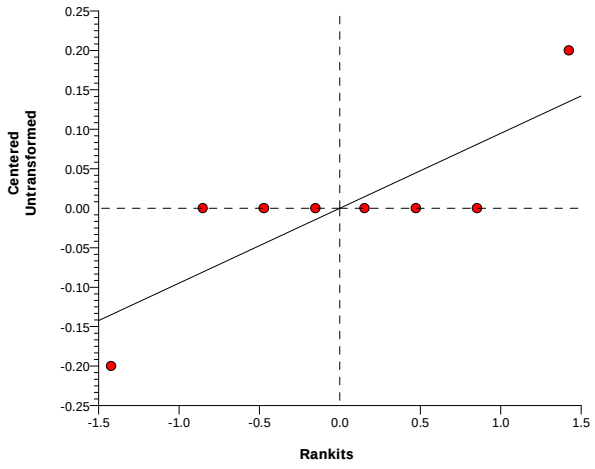
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Varianc	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7322		0.0052	Non-normal Distribution

Mean ~~Cystocarps Summary~~ Branch Viability Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
18770-000	4	4	4	4	4	4	0	0	0.0%	0.0%
18770-005	4	3.2	3.138	3.262	3	3.4	0.03032	0.1633	5.1%	20.0%

Graphics





SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 18770 ~~18622~~	LOCATION: New Bedford Harbor					
CHEMISTRY	Lab Salt Control	-001 ~~Reference Site~~ 200 NTU	-002 ~~200 NTU~~ 150 NTU	-003 ~~150 NTU~~ 100 NTU	-004 ~~100 NTU~~ 50 NTU	-005 ~~50 NTU~~ Ref
AMMONIA	18708-021	~~18622~~-006 (2) 18770-006	007	008	009	010
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004	-005
SALINITY (ppt)	25.0	23.2	19	17.4	21.5	27.4
pH (SU)	7.97	7.27	7.37	7.40	7.54	7.71
TRC (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
DO (mg/L)	7.2	7.0	6.9	6.9	6.8	6.2
S/C (µmhos/cm)	38360					
WQ STATION USED	1					
INITIALS	LRO					
A. bahia SALINITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004	-005
SAMPLE (mLs)		4000	4000	4000	4000	4000
SEA SALT (g)		9	28	35	16	—
DATE:	7/23/09					
TIME:	1400					
INITIALS:	SJ					

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004
-005	-005

DILUTIONS

STUDY: 18720	CLIENT: Woods Hole Group	
SPECIES: *A. bahia*		
	Sample: New Bedford Harbor	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
Lab	0	800
Reference Water 005	800	↓
50 NTU 004	↓	↓
100 NTU 003	↓	↓
150 NTU 002	↓	↓
200 NTU 001	↓	↓
INITIALS:	SJ	
TIME:	1500	
DATE:	7/24/09	

RECORD OF METERS USED

STUDY: 18770		CLIENT: Woods Hole Group	
A.bahia			
Exposure (Hours)			
	0	24	48
Water Quality Station #	2	2	
Initials / Date	SJ 7/28/09	SJ 7/24	

Water Quality Station #1		Water Quality Station #2		**COMMENTS**
DO meter #		DO meter #	23	
DO probe #		DO probe #	20	
pH meter #		pH meter #	470	
pH probe #		pH probe #	85	
S/C meter #		S/C meter #	YSI30D	
S/C probe #		S/C probe #	↓	
Salinity meter #		Salinity meter #		

Report No: 18770 SDG:
Project: NBH Monitoring

Sample ID: DS-TOX-001-072209
Matrix: Water
Sampled: 07/22/09 0826

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-006	0.15	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-002-072209
Matrix: Water
Sampled: 07/22/09 0952

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-007	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-003-072209
Matrix: Water
Sampled: 07/22/09 0951

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-008	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-004-072209
Matrix: Water
Sampled: 07/22/09 0951

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-009	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Sample ID: DS-TOX-005-072209
Matrix: Water
Sampled: 07/23/09 0949

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18770-010	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Notes:

ND = Not Detected

Report No: 18708 SDG:
Project: Laboratory Seawater

Sample ID: Lab Salt 07/23/09
Matrix: Water
Sampled: 07/23/09

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Ammonia-N	18708-027	ND	0.1	mg/L as N	07/27/09	07/27/09	MES/SM 4500-NH3 G

Notes:

ND = Not Detected

EnviroSystems, Inc. P.O. Box 778 Hampton, NH 03842-0778 603-926-3345 fax 603-926-3521 www.envirosystems.com

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	~~18622~~ 18770 E3 SS 7/23/09		
SDG No:			
Project:	New Bedford Harbor Monitoring		
Delivered via:	Client		
Date and Time Received:	07/23/09 1747	Date and TIme Logged into Lab:	01/23/09 0820
Recieved By:	SJ	Logged into Lab by:	SJ
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	Yes	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	2	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:		Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
DS-TOX-001-072209	18770 ~~18622~~-001	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-002-072209	18770 ~~18622~~-002	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-003-072209	18770 ~~18622~~-003	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-004-072209	18770 ~~18622~~-004	W	AB48AD, AP01CR, CP48AD;	20 L	4C	
DS-TOX-005-072209	18770 ~~18622~~-005	W	AB48AD, AP01CR, CP48AD;	20 L	4C	

Notes and qualifications:

ESI

EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 3/18622 EMS 7/23/09 18770

CHAIN OF CUSTODY DOCUMENTATION

Client: Woods Hole Group	Contact: Dave Walsh	Project Name: NBH monitoring	Page 1 of 1
Report to: Dave Walsh	Address: 81 Technology Park	Project Number: TO-0010	
Invoice to: Cathy Morey	Address: E. Falmouth, MA	Project Manager: Dave Walsh	
Voice: 508-540-8080	Fax: 508-540-1001	email: dwalsh@whgrp.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.) (5GAL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
001	DS-TOX-001-072209	7/22	0826	KGM	G	20L	P	N/A	W	N	toxicity ~~[illegible]~~ (acute)
002	DS-TOX-002-072209	7/22	0952	KGM	C	20L	P	N/A	W	N	acute toxicity
003	DS-TOX-003-072209	7/22	0951	KGM	C	20L	P	N/A	W	N	acute toxicity
004	DS-TOX-004-072209	7/22	0951	KGM	C	20L	P	N/A	W	N	acute toxicity
005	DS-TOX-005-072209	7/22	0949	KGM	G	20L	P	N/A	W	N	acute toxicity

Relinquished By: Kaitlyn McCartney Date: 7/22/09 Time: 1355
Received By: Martin Potter Date: 07/22/09 Time: 1355

Relinquished By: Martin Potter Date: 07/22/09 Time: 1747
Received at Lab By: [signature] Date: 7/22/09 Time: 1747

Comments:

COC Doc No: 3765

Sample Delivery Group No: Page of