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GULFCO MARINE MAINTENANCE
BASELINE ECOLOGICAL RISK ASSESSMENT

21d WHOLE-SEDIMENT TOXICITY TESTS
Neanthes arenaceodentata

URS Subcontract Number 236208.UB
Work Order Number 237933.US

PBS&J Log No. 10-1109

Prepared for:

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1. Introduction

PBS&J was subcontracted by URS Corporation (URS), in support of a URS prime contract with the Dow Chemical Company, to conduct whole-sediment bioassays of samples collected from the Gulfco Marine Maintenance NPL site, located in Brazoria County near Freeport, Texas. Data acquired through tests conducted by PBS&J will be used to support decisions required for a Baseline Ecological Risk Assessment.

The tests reported herein were added to the original work scope as a replacement for a 28-day earthworm survival and growth test of upland soils collected at the Gulfco Marine Maintenence site. The earthworm tests demonstrated massive mortality, believed to have been caused by the high salt content of the soils. The soils were hydrated with reconstituted seawater and tested as sediment.

2. Methods and Materials

The toxicity tests reported herein were conducted in accordance with protocols and internal standard operating procedures (SOP) as identified below.

Test Title	Protocol	PBS&J SOP
21-day *Neanthes arenaceodentata* Survival and Growth Test	ASTM 1611	4049

2.1 Laboratory Facilities

The toxicity tests were conducted at the PBS&J Environmental Toxicology Laboratory in Houston, Texas in temperature-controlled rooms maintained at 20±1°C. Cool-white fluorescent light fixtures positioned over benches in the testing areas provided a light intensity of 100-1000 lux (~10-100 ft-c); the photoperiod was 16L:8D hours.

2.2 Test Organism

Neanthes arenaceodentata, a polychaetous annelid, were obtained from cultures maintained at the California State University at Long Beach. Specimens were 2-3 weeks old at the beginning of the test.

2.3 Overlying Water

Reconstituted saltwater was prepared from a commercial aquarium sea-salt mix (HW Marinemix). Make-up water was provided by a high-capacity, water purification system (activated carbon, cation exchange, anion exchange, mixed-bed resin polishing); the City of Houston municipal water supply was the ultimate water source.

2.4 Soil Samples

The soil samples were collected over several days during August 13-17, by Benchmark Ecological Services, Inc. personnel. The samples were placed into 3.5-gal plastic buckets (sediments), packed (in wet ice) in insulated coolers, and transported on the same or following day to the PBS&J laboratory following standard chain-of custody procedures. The samples were in good condition upon arrival at the lab and showed no evidence of tampering during transit. The samples were stored until used in a darkened, walk-in cooler maintained at 1-6 °C.

2.5 Control Media

Subtidal sediment from the York River, Virginia (supplied by Chesapeake Cultures) was used as a control medium for the *Neanthes* tests. The control sediment was press-sieved through a 500 µM stainless steel screen to remove vegetative matter and macrofauna, then frozen to kill microfauna that could prey upon the test organisms.

2.6 Sample Preparation

For the tests reported herein, reconstituted seawater was added in small portions to about 1000 cc of soil in a polyethylene mixing bowl; the mixture was stirred and kneaded with a polyethylene spatula until it had reached a consistency similar to a typical marine/estuarine sediment.

2.7 Exposure Systems

The tests were conducted in 1 qt, glass canning jars. Sediment[1] was placed into each jar to a depth of about 2 cm (~175 cc volume) and each jar was filled with ~775 mL reconstituted seawater. The test containers were allowed to stand overnight to facilitate settling of fine particles disturbed during filling.

2.8 Experimental Design

The tests were static renewal exposures; the overlying water in each test jar was changed once each day. Five replicate treatments were established for each sediment; each test container received 5 polychaetes. Five milliliters of TetraMin/alfalfa suspension[2] was added to 3.3 L test water prior to daily renewal for each set of the polychaete test jars.

The test containers were aerated gently (~60 bubbles·min^{-1}) throughout the test and covered to minimize evaporative losses and concomitant increases in salinity. Temperature, dissolved oxygen, pH, salinity, and total ammonia nitrogen were measured in a small sample composited across the replicates for each test treatment.

The tests were terminated after 21 days. The sediment was wet-sieved (0.5-mm screen) to remove surviving adult organisms. Surviving polychaetes were counted, then dried overnight in a 60-degree oven for dry-weight measurements.

2.9 Reference Toxicant Tests

PBS&J conducts reference toxicant tests with vendor-supplied organisms on a per-lot basis or, if more than one lot of test organisms is received within in a one-month period, a least once during that month. Reference toxicant tests with the polychaete consisted of 96-hr (water-only) exposures to cadmium. The median lethal concentration (LC50) was determined by the Trimmed Spearman-Karber method.

2.10 Statistical Analyses

Statistical analysis was performed on survival and growth (dry-biomass and dry-weight) data to determine if results for the Gulfco sites were significantly different from the results of the control and/or reference sediment group(s). Statistical analyses were conducted at a 95% confidence level (α= 0.05), using CETIS™v1.8.0.4 (Tidepool Scientific Software, McKinleyville, CA).

Following distribution tests,[3] mean survival, mean biomass,[4] and mean dry-weght[5] were examined using the Student-Newman-Kuels test or Dunnett's Multiple Comparisons test.

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1 As used herein, "sediment" refers to the hydrated soil samples prepared as described in 2.6.

2 Two grams each, finely-ground TetraMin® flake food and alfalfa flower, per liter synthetic test water (4 mg/ml)/

3 Bartlett and Modified-Levene tests for variance equality; Shapiro-Wilk, Kilmogorov-Smirnov, D'Agostino, and Anderson-Darling tests for normal distribution.

4 Mean dry biomass as used herein is the difference between dry weight of the organisms (total weight - tare weight) divided by the number of organisms exposed to the test or control sediment.

5 Mean dry wreight as used herein is the difference between dry weight of the organisms (total weight - tare weight) divided by the number of surviving organisms (pan count) exposed to the test or control sediment.

3. Results

Sample chain-of-custody documents are provided in Appendix A. Original test records, including reference toxicant test results, are given in Appendix B. Statistical analyses are presented in Appendix C.

3.1 Overlying Water Quality Characteristics

The temperature of overlying waters during the polychaete test remained constant at 19±1°C. The salinity of the overlying waters ranged from 23 to 27‰ . Dissolved oxygen (DO) concentrations remained above 7.2 mg/L, or above ~94% saturation (based on the temperature and salinity of the test waters). Overlying water pH ranged between 7.6 and 8.2 during the tests, but varied day-to-day within test treatments. Total NH_3-N concentrations in the overlying waters ranged from <0.01 to 1.41 mg/L. The maximum NH_3-N value was observed on day 1 of the test in the composite sample obtained from the Control replicate jars.

3.2 *Neanthes arenaceodentata* ToxicityTests

A negative control group, consisting of five replicate treatments with 5 organisms per replicate, was employed in the polychaete tests.

Survival Endpoint: No mortality was observed in any of the control group replicates; thus, the minimum test acceptance criteria[6] were met. Survival of *Neanthes* exposed to the Gulfco sediments ranged from 60% (NAS-09) to 96% (NAS-03). The mean survival of worms exposed to sediments from stations NAS-08 and NAS-09 were statistically less than that of the control group.

Growth Endpoints: The mean dry-biomass (and mean dry-weight, as there were no mortalities) of the control group polychaetes was 2.058 mg (per organism). Mean dry-biomass of polychaetes exposed to the sediments ranged from 0.5512 mg (NAS-09) to 4.52 mg (NAS-04). Mean dry-weight metrics for the site sediments ranged from 0.9815 mg (NAS-09) to 5.423 mg (NAS-04). Mean dry-biomass and mean dry-weight values for the Gulfco sediments were not statistically less than[7] that of the control group mean values.

3.3 Reference Toxicant Results

PBS&J conducts a reference toxicant test using cadmium (administered as an aqueous solution of the chloride salt) with each lot of *Neanthes arenaceodentata* to document that the test lot is suitable for the intended use. Results of reference toxicant test conducted with specimens from the organisms used for the sediment tests reported herein are summarized below.

Taxon	96h LC50 (mg/L Cd)	95% Confidence Limits
Neanthes arenaceodentata	7.40	6.86-7.99

4. Summary

Survival of the polychaetes exposed to the control sediment exceeded the test acceptability criteria, indicating that the organisms were suitable for the intended use. As summarized below, three of the Gulfco sediments produced toxicity endpoint metrics which were statistically less than the corresponding negative-control group metrics; the NAS-01 and NAS-09 samples scored 2 or more such "toxicity hits."

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[6] A toxicity test is unacceptable if average survival in the negative control is below 90% or if survival is below 80% in an individual control test chamber.

[7] The mean dry-biomass and mean dry-weight values of organisms exposed tothe NAS-04 sediment were statistically greater than that of the control group organisms.

No Gulfco sediment exhibited a toxicity endpoint metric which was statistically less than the corresponding metric of any of the internal reference sites (NAS-07, NAS-08, and NAS-09).

Station ID	*Neanthes arenaceodentata*			"Toxicity Hits"
	Survival	Biomass	Dry-weight	
NAS-01		X	X	2
NAS-02				
NAS-03				
NAS-04				
NAS-05				
NAS-06				
NAS-07				
NAS-08	X			1
NAS-09	X	X	X	3

5. References

ASTM, 2000. Standard Test Method for Conducting Sediment Toxicity Tests with Polychaetous Annelids (ASTM E 1611-2000). American Society for Testing and Materials, Philadelphia, PA.

Appendix A

Sample Custody Forms

PBS&J

Environmental Toxicology Laboratory
888 West Sam Houston Parkway South
Suite 110
Houston, Texas 77042

Tel: (713) 977-1500
Fax: (713) 977-9233

Analysis Request and Chain of Custody Record
Please indicate type of test required

	C. dubia (Waterflea)	D. pulex (Waterflea)	P. promelas (Fathead minnow)	M. bahia (opossum shrimp)	M. beryllina (Inland silverside)	Eisenia fetida			
Client Name: URS									
Contact Name: David Lingle Tel: 713 914 6699	☐ 24 hr	☐ 24 hr	☐ 24 hr	☐ 24 hr	☐ 24 hr	☒ 28 day	☐	☐	☐
P.O. Number:	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐	☐	☐	☐
Project Name: Gulfco BERA	☐ 7 day	☐ 7 day	☐ 7 day	☐ 7 day	☐ 7 day	☐	☐	☐	☐
PBS&J Job No:	☐	☐	☐	☐	☐	☐	☐	☐	☐

Special Instructions/comments:

	Sample Location/ID& outfall	Sample Type (Effluent, receiving water, Sediment, etc.)	Sample Date (mm/dd/yy)		Sample Time (Military)		PBS&J Use Only			
							Containers Received		Temperature	
			From	To	From	To	Number	Tot. Vol.	°C	Init.
1	NAS01	Soil	8-13-10	—	1232	—				
2										
3										
4										
5										
6										
7										

Sampled by: Neil Henthorne (Print Name) [signature] (Signature)

Samples received in good condition ☐ Yes ☐ No

	Relinquished by:	Date:	Time:	Received by:	Date:	Time:
1	Brett Souter [signature]	8-13-10	1602	[signature]	8/13/10	1602
2						
3						
	PBS&J Use Only: Received at PBS&J Laboratory:				All PBS&J Std Terms and Conditions Apply	

PBS&J

Environmental Toxicology Laboratory
888 West Sam Houston Parkway South
Suite 110
Houston, Texas 77042

Tel: (713) 977-1500
Fax: (713) 977-9233

Analysis Request and Chain of Custody Record

Please indicate type of test required

	C. dubia (Waterflea)	D. pulex (Waterflea)	P. promelas (Fathead minnow)	M. bahia (opossum shrimp)	M. beryllina (Inland silverside)	Eisenia fetida			
Client Name: URS									
Contact Name: David Lingle Tel: 713-914-6699	☐ 24 hr	☐ 24 hr	☐ 24 hr	☐ 24 hr	☐ 24 hr	☒ 28 day	☐	☐	☐
P.O. Number:	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐	☐	☐	☐
Project Name: Gulfco BERA	☐ 7 day	☐ 7 day	☐ 7 day	☐ 7 day	☐ 7 day	☐	☐	☐	☐
PBS&J Job No:	☐	☐	☐	☐	☐	☐	☐	☐	☐

Special Instructions/comments:

	Sample Location/ID& outfall	Sample Type (Effluent, receiving water, Sediment, etc.)	Sample Date (mm/dd/yy) From	Sample Date (mm/dd/yy) To	Sample Time (Military) From	Sample Time (Military) To	PBS&J Use Only: Containers Received Number	Containers Received Tot. Vol.	Temperature °C	Temperature Init.
1	NAS02	Soil	8-16-10		1528		1	2 GAL		DWM
2	NAS03				1600		1			
3	NAS05				1618		1			
4	NAS04				1636		1			
5	NAS06				1700		1			
6										
7										

Sampled by: Neil Henthorne (Print Name) [signature] (Signature)

Samples received in good condition ☑ Yes ☐ No

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
1 [signature]	8-17-10	1230	Dennis Melody	8-17-10	1230
2					
3					
PBS&J Use Only: Received at PBS&J Laboratory:	8-17-10	1230	Dennis Melody	All PBS&J Std Terms and Conditions Apply	

PBS&J

Environmental Toxicology Laboratory
888 West Sam Houston Parkway South
Suite 110
Houston, Texas 77042

Tel: (713) 977-1500
Fax: (713) 977-9233

Analysis Request and Chain of Custody Record

Please indicate type of test required

	C. dubia (Waterflea)	D. pulex (Waterflea)	P. promelas (Fathead minnow)	M. bahia (opossum shrimp)	M. beryllina (Inland silverside)	Eisenia fetida			
Client Name: URS									
Contact Name: David Wingle Tel: 713 914-6699	☐ 24 hr	☐ 24 hr	☐ 24 hr	☐ 24 hr	☐ 24 hr	☒ 28day	☐	☐	☐
P.O. Number:	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐ 48 hr	☐	☐	☐	☐
Project Name: Gulfco BERA	☐ 7 day	☐ 7 day	☐ 7 day	☐ 7 day	☐ 7 day	☐	☐	☐	☐
PBS&J Job No:	☐	☐	☐	☐	☐	☐	☐	☐	☐

Special Instructions/comments:

	Sample Location/ID& outfall	Sample Type (Effluent, receiving water, Sediment, etc.)	Sample Date (mm/dd/yy) From	Sample Date (mm/dd/yy) To	Sample Time (Military) From	Sample Time (Military) To	PBS&J Use Only: Containers Received Number	Containers Received Tot. Vol.	Temperature °C	Temperature Init.
1	NAS07	Soil	8-17-10	/	0900		1	2 GAL		DWM
2	NAS08	|	|	/	0931		1	2 GAL		↓
3	NAS09	|	|	/	1002		1	2 GAL		↓
4										
5										
6										
7										

Sampled by: Neil Heathorne (Print Name) — Neil Heathorne (Signature)

Samples received in good condition ☑ Yes ☐ No

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
1 [signature]	8-17-10	1230	Dennis Melder	8-17-10	1230
2					
3					
PBS&J Use Only: Received at PBS&J Laboratory:	8-17-10	1230	Dennis Melder	All PBS&J Std Terms and Conditions Apply	

Appendix B

Toxicity Test Records

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Neanthes arenaceodentata 21d Test Condition Summary - ASTM E 1611; PBS&J SOP No. 4049			
Test Material:	Sediment	Test Type:	21d Bioaccumulation Static Renewal
Temperature:	20 ± 1 °C	Photoperiod:	16L:8D
Test Chamber:	1L glass beaker or wide mouth jar	No. Replicates:	5
Test Organism:	***Neanthes arenaceodentata***	Organism Source:	California State U. - Long Beach
Organism Batch No.:	10-00889	Date Received:	9/9/10
Age Class:	2-3 week old juveniles	No. Organisms/Rep:	5
Aeration:	Moderate, overnight before start of test and throughout duration of test; maintain ≥ 90% saturation of dissolved oxygen concentration	Control Sediment:	Natural sediment from which the test organisms are collected
Feeding Schedule:	feed once per day	Food Type:	1 mL TetraMarin®/Alfalfa suspension per test vessel
Water Type:	clean seawater, natural or reconstituted (28-36ppt)	Water Volume:	775 mL
Renewal Schedule:	24 h intervals, beginning on day 0 (minimum) or as specified	Sediment Volume:	~175 mL (2cm depth)

Comments:

***See attached documentation for chemistry analysis results.**

Water Changes/Feeding											
Day	0	1	2	3	4	5	6	7	8	9	10
Date	9/10/10	9/11/10	9/12/10	9/13/10	9/14/10	9/15/10	9/16/10	9/17/10	9/18/10	9/19/10	9/20/10
Time	~~1100~~ ①	1100	1000	0900	1000	0900	1030	1100	1030	1000	0900
Initials	Km/LB	DK	RB	SK	DK	SK	SK	DK	DK	DK	LB
Day	11	12	13	14	15	16	17	18	19	20	
Date	09/21/10	09/22/10	9/23/10	9/24/10	9/25/10	9/26/10	9/27/10	09/28/10	9/29/10	9/30/10	
Time	1430	1030	0830	1100	1100	0900	0930	1430	0900	1200	
Initials	Km	Km	LB	RB/SK	DK	DK	DK	Km	DC	LB	

① IE RB 9/10/10 ⟶ [1030]

Initial Review Completed By: R. B

Final Review Completed By: Jo Mondini

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Initiation Date:	9/10/10	Termination Date:	~~9~~ ①
Initiation Time:	1300	Termination Time:	1330
Initials:	RB / RB	Initials:	DK / SK / RB

***Neanthes arenaceodentata* - Survival**

Treatment	Rep	Day 0	Day 21 1st Count	Day 21 2nd Count	Treatment	Rep	Day 0	Day21 1st Count	Day21 2nd Count
CONT	A	5	5	5	NAS 04	A	5	3	3
	B	5	5	5		B	5	5	5
	C	5	5	5		C	5	~~5~~ ②	~~5~~ ②
	D	5	5	5		D	5	5	5
	E	5	5	5		E	5	4	4
NAS 01	A	5	3	3	NAS 05	A	5	4	4
	B	5	5	5		B	5	5	5
	C	5	2	2		C	5	2	2
	D	5	4	4		D	5	3	3
	E	5	5	5		E	5	5	5
NAS 02	A	5	5	5	NAS 06	A	5	~~5~~ ②	4
	B	5	4	4		B	5	5	5
	C	5	5	5		C	5	5	5
	D	5	4	4		D	5	4	4
	E	5	4	4		E	5	4	4
NAS 03	A	5	5	5	NAS 07	A	5	5	5
	B	5	4	4		B	5	5	5
	C	5	5	5		C	5	4	4
	D	5	5	5		D	5	5	5
	E	5	5	5		E	5	4	4
Tech Initials		RB	SK DK	RB	Tech Initials:		RB	SK DK	RB

① IE RB 10/1/10 → [10/1/10]
② IE RB 10/1/10 → [4]

Initial Review Completed By: R. B

Final Review Completed By: J Monclew

Client/Project Name:	URS - Gulfco BERA	Login #:	16 - 1109	Job #:	100016848

Neanthes arenaceodentata - Survival									
Treatment	Rep	Day 0	Day 21		Treatment	Rep	Day 0	Day21	
			1st Count	2nd Count				1st Count	2nd Count
NAS 08	A	5	3	3		A			
	B	5	~~3~~ ~~2~~ ②	2		B			
	C	5	4	4		C			
	D	5	3	3		D			
	E	5	4	4		E			
NAS 09	A	5	~~3~~ ②	2		A			
	B	5	4	4		B			
	C	5	3	3		C			
	D	5	2	2		D			
	E	5	4	4		E			
	A					A			
	B					B			
	C					C			
	D					D			
	E					E			
	A					A			
	B					B			
	C					C			
	D					D			
	E					E			
Tech Initials		RB	SK DK	RB	Tech Initials:				

~~① IE RB 9 ②~~
② IE RB 10/1/10 → [2]

Initial Review Completed By: R. B

Final Review Completed By: J. Mondin

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Daily Observations

Treatment / Site	Rep.	Day 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CONTROL	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 01	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 02	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 03	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 04	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 05	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Technician Initials:		DM	DK	DM	SK	DK	SK	SK	DK	DK	DK	CB	KM	KM	CB	SK

Key: E = Emergent
D = Dead
✓ = All organisms burrowed

Initial Review Completed By: R. B

Final Review Completed By: Jo Mondieu

Client/Project Name:	URS - Gulfco BERA	Login #:	10 - 1109	Job #:	100016848

Daily Observations

Treatment / Site	Rep.	Day 15	16	17	18	19	20	21
CONTROL	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 01	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 02	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 03	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 04	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 05	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
Technician Initials:		DK	DK	DK	KM	KO	LB	DK

Key: E = Emergent
D = Dead
✓ = All organisms burrowed

Initial Review Completed By: R. B.

Final Review Completed By: Jo Mondieu

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Daily Observations

Treatment / Site	Rep.	Day 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NAS 06	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 07	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 08	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAS 09	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	A															
	B															
	C															
	D															
	E															
	A															
	B															
	C															
	D															
	E															
Technician Initials:		RB	DL	RB	SK	DL	SK	SK	DL	DL	DK	LB	[illegible]	[illegible]	LB	SK

Key: E = Emergent
D = Dead
✓ = All organisms burrowed

Initial Review Completed By: R. B[illegible]

Final Review Completed By: Jo Mondier

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Daily Observations

Treatment / Site	Rep.	Day 15	16	17	18	19	20	21
NAS 06	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 07	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 08	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
NAS 09	A	✓	✓	✓	✓	✓	✓	✓
	B	✓	✓	✓	✓	✓	✓	✓
	C	✓	✓	✓	✓	✓	✓	✓
	D	✓	✓	✓	✓	✓	✓	✓
	E	✓	✓	✓	✓	✓	✓	✓
	A							
	B							
	C							
	D							
	E							
	A							
	B							
	C							
	D							
	E							
Technician Initials:		DK	DK	DK	KM	RM	LB	DK

Key: E = Emergent
D = Dead
✓ = All organisms burrowed

Initial Review Completed By: R. B.

Final Review Completed By: J. Mondieu

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Tissue Weight - *N. arenaceodentata*

Treatment/Site (%)	REP	Pan #	Tare Weight (g)	TOTAL WT (g)
Archive	A	1	.00924	.01169
	B	2	.00995	.01034
	C	3	.01027	~~.01080~~
	D	4	.01040	.01126
	E	5	.01060	.01105
Control	A	6	.00729	.02011
	B	7	.00870	.02005
	C *	8	.00765	.01703
	D	9	.00798	.01525
	E	10	.00805	.01869
NAS 01	A	11	.00771	.01252
	B *	12	.00775	.01065
	C	13	.00720	.00994
	D	14	.00778	.01020
	E	15	.00731	.01106
NAS 02	A	16	.00774	.02102
	B	17	.00710	.01615
	C	18	.00761	.01895
	D *	19	.00810	.01974
	E	20	.00787	.01563
NAS 03	A	21	.00795	.01754
	B	22	.00792	.01803
	C	23	.00805	.02484
	D	24	.00665	.02124
	E *	25	.00759	.02159
NAS 04	A	26	.00714	.02429
	B	27	.00691	.03081
	C	28	.00695	.02778
	D	29	.00683	.03425
	E	30	.00762	.03132
NAS 05	A	31	.00709	.02570
	B *	32	.00702	.01826
	C	33	.00747	.01393
	D	34	.00705	.01160
	E	35	.00721	.01630
NAS 06	A	36	.00672	.01180
	B	37	.00670	.01520
	C *	38	.00711	~~.01770~~ ②
	D	39	.00736	.01458
	E	40	.00693	.01932
NAS 07	A	41	.00691	.01547
	B	42	.00725	.01569
	C	43	.00741	.01721
	D	44	.00710	.01385
	E	45	.00658	.01135

DATE/TIME Drying Initiated: 10/01/10 / 1500

DATE/TIME Drying Terminated: 10/02/10 / 1530

BALANCE ID#: 791

INITIALS: DK / DK

CONT = Control CONC = Concentration REP = Replicate

Wt. = Weight ORG. = Organism

① IE DK 9/23/10 → [.01072]

② IE DK 10/2/10 → [.01511]

Initial Review Completed By: DK

Final Review Completed By: JoMondier

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Tissue Weight - *N. arenaceodentata*

Treatment/Site (%)	REP	Pan #	Tare Weight (g)	TOTAL WT (g)	Treatment/Site (%)	REP	Pan #	Tare Weight (g)	TOTAL WT (g)
NAS 08	A	46	.00679	.01064	QA/QC	A	8	.00763	.01701
	B	47	.00669	.00861		B	12	.00772	.01062
	C	48	.00676	.00952		C	19	.00811	.01975
	D	49	.00722	.01130		D	25	.00758	.02158
	E	50	.00694	.01153		E	32	.00704	.01823
NAS 09	A	51	.00677	.01091	QA/QC	A	38	.00708	.01510
	B	52	.00746	.01075		B			
	C	53	.00708	.00951		C			
	D	54	.00763	.00853		D			
	E	55	.00753	.01055		E			
	A					A			
	B					B			
	C					C			
	D					D			
	E					E			
	A								
	B								
	C								
	D								
	E								
	A								
	B								
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	E								
	A								
	B								
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	D								
	E								
	A								
	B								
	C								
	D								
	E								

DATE/TIME Drying Initiated 10-01-10 / 1500

DATE/TIME Drying Terminated 10-02-10 / 1530

BALANCE ID# 791

INITIALS DK / DK

CONT = Control CONC = Concentration REP = Replicate

Wt. = Weight ORG. = Organism

Initial Review Completed By: DK

Final Review Completed By: Jo Mondieu

Client/Project Name:	URS - Gulfco BERA	Login #:	10-1109	Job #:	100016848

Test Notes

Comments	Date	Time	Initials

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/7/10	URS - Gulfco BERA CONTROL - NEW Day -1	19 / 19	7.9	0930	HL/RB
9/10/10	URS - Gulfco BERA CONTROL - NEW Day 0	17 / 18	7.6	1000	HL/DIL
	URS - Gulfco BERA CONTROL Day 0	18 / 19	7.7		
	URS - Gulfco BERA NAS 01 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 02 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 03 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 04 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 05 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 06 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 07 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 08 Day 0	18 / 18	7.8		
	URS - Gulfco BERA NAS 09 Day 0	18 / 18	7.8		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/9/10	URS - Gulfco BERA CONTROL - NEW Day -1	25	7.9	NM	/RB
9/10/10	URS - Gulfco BERA CONTROL - NEW Day 0	25	7.5	NA	HL/DIL
	URS - Gulfco BERA CONTROL Day 0	25	7.5	1.15	
	URS - Gulfco BERA NAS 01 Day 0	26	7.6	<0.01	
	URS - Gulfco BERA NAS 02 Day 0	25	7.7	<0.01	
	URS - Gulfco BERA NAS 03 Day 0	26	7.7	<0.01	
	URS - Gulfco BERA NAS 04 Day 0	25	7.7	0.04	
	URS - Gulfco BERA NAS 05 Day 0	26	7.7	<0.01	
	URS - Gulfco BERA NAS 06 Day 0	26	7.7	0.02	
	URS - Gulfco BERA NAS 07 Day 0	26	7.7	<0.01	
	URS - Gulfco BERA NAS 08 Day 0	26	7.7	0.01	
	URS - Gulfco BERA NAS 09 Day 0	26	7.7	<0.01	

Comments: ①IE HL 9/10/10 → [1b]

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/11/10	URS - Gulfco BERA CONTROL - NEW Day 1	18 / 18	7.8	1200	VIC
	URS - Gulfco BERA CONTROL Day 1	18 / 18	7.9		
	URS - Gulfco BERA NAS 01 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 02 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 03 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 04 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 05 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 06 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 07 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 08 Day 1	18 / 18	8.0		
	URS - Gulfco BERA NAS 09 Day 1	18 / 18	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/11/10	URS - Gulfco BERA CONTROL - NEW Day 1	26	7.3	NA	DK
	URS - Gulfco BERA CONTROL Day 1	27	7.4	1.41	
	URS - Gulfco BERA NAS 01 Day 1	27	7.4	0.07	
	URS - Gulfco BERA NAS 02 Day 1	27	7.3	0.03	
	URS - Gulfco BERA NAS 03 Day 1	27	7.3	<0.01	
	URS - Gulfco BERA NAS 04 Day 1	27	7.3	<0.01	
	URS - Gulfco BERA NAS 05 Day 1	27	7.2	0.04	
	URS - Gulfco BERA NAS 06 Day 1	27	7.3	0.01	
	URS - Gulfco BERA NAS 07 Day 1	27	7.3	<0.01	
	URS - Gulfco BERA NAS 08 Day 1	27	7.3	<0.01	
	URS - Gulfco BERA NAS 09 Day 1	27	7.3	0.05	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/12/10	URS - Gulfco BERA CONTROL - NEW Day 2	19 / 19	8.1	0930	fB
	URS - Gulfco BERA CONTROL Day 2	19 / 19	7.8		
	URS - Gulfco BERA NAS 01 Day 2	19 / 19	7.9		
	URS - Gulfco BERA NAS 02 Day 2	19 / 19	7.9		
	URS - Gulfco BERA NAS 03 Day 2	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 2	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 2	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 2	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 2	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 2	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 2	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/12/10	URS - Gulfco BERA CONTROL - NEW Day 2	25	8.1	1.87	RB/DK
	URS - Gulfco BERA CONTROL Day 2	25	7.3	<0.01	
	URS - Gulfco BERA NAS 01 Day 2	27	7.3	<0.01	
	URS - Gulfco BERA NAS 02 Day 2	26	7.3	<0.01	
	URS - Gulfco BERA NAS 03 Day 2	26	7.4	0.03	
	URS - Gulfco BERA NAS 04 Day 2	26	7.5	0.27	
	URS - Gulfco BERA NAS 05 Day 2	27	7.5	<0.01	
	URS - Gulfco BERA NAS 06 Day 2	26	7.6	<0.01	
	URS - Gulfco BERA NAS 07 Day 2	26	7.6	<0.01	
	URS - Gulfco BERA NAS 08 Day 2	26	7.7	<0.01	
	URS - Gulfco BERA NAS 09 Day 2	26	7.7	<0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/13/10	URS - Gulfco BERA CONTROL - NEW Day 3	19 / 19	7.9	1000	HL
	URS - Gulfco BERA CONTROL Day 3	19 / 19	7.9		
	URS - Gulfco BERA NAS 01 Day 3	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 3	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 3	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 3	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 3	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 3	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 3	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 3	19 / 19	7.9		
	URS - Gulfco BERA NAS 09 Day 3	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/13/10	URS - Gulfco BERA CONTROL - NEW Day 3	25	7.6	0.87	HL
	URS - Gulfco BERA CONTROL Day 3	28	7.6	<0.01	
	URS - Gulfco BERA NAS 01 Day 3	26	7.7	<0.01	
	URS - Gulfco BERA NAS 02 Day 3	26	7.7	<0.01	
	URS - Gulfco BERA NAS 03 Day 3	26	7.7	0.39	
	URS - Gulfco BERA NAS 04 Day 3	26	7.7	0.46	
	URS - Gulfco BERA NAS 05 Day 3	25	7.7	0.34	
	URS - Gulfco BERA NAS 06 Day 3	26	7.7	<0.01	
	URS - Gulfco BERA NAS 07 Day 3	26	7.8	0.29	
	URS - Gulfco BERA NAS 08 Day 3	26	7.7	0.81	
	URS - Gulfco BERA NAS 09 Day 3	26	7.7	0.34	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/14/10	URS - Gulfco BERA CONTROL - NEW Day ~~5~~ 1	19 / 19	7.9	0930	HL
	URS - Gulfco BERA CONTROL Day ~~5~~ 1	19 / 19	7.7		
	URS - Gulfco BERA NAS 01 Day ~~5~~ 1	19 / 19	7.8		
	URS - Gulfco BERA NAS 02 Day ~~5~~ 1	19 / 19	7.8		
	URS - Gulfco BERA NAS 03 Day ~~5~~ 1	19 / 19	7.9		
	URS - Gulfco BERA NAS 04 Day ~~5~~ 1	19 / 19	7.9		
	URS - Gulfco BERA NAS 05 Day ~~5~~ 1	19 / 19	7.9		
	URS - Gulfco BERA NAS 06 Day ~~5~~ 1	19 / 19	7.9		
	URS - Gulfco BERA NAS 07 Day ~~5~~ 1	19 / 19	7.9		
	URS - Gulfco BERA NAS 08 Day ~~5~~ 1	19 / 19	7.7		
	URS - Gulfco BERA NAS 09 Day ~~5~~ 1	19 / 19	7.8		

Comments: 1 IE HL 9/14/10 → [Y]

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/14/10	URS - Gulfco BERA CONTROL - NEW Day 4	25	7.7	<0.01	HL
	URS - Gulfco BERA CONTROL Day 4	25	7.7	<0.01	
	URS - Gulfco BERA NAS 01 Day 4	27	7.7	0.03	
	URS - Gulfco BERA NAS 02 Day 4	25	7.7	<0.01	
	URS - Gulfco BERA NAS 03 Day 4	26	7.8	0.11	
	URS - Gulfco BERA NAS 04 Day 4	25	7.8	0.10	
	URS - Gulfco BERA NAS 05 Day 4	26	7.9	0.14	
	URS - Gulfco BERA NAS 06 Day 4	26	7.9	<0.01	
	URS - Gulfco BERA NAS 07 Day 4	26	7.9	<0.01	
	URS - Gulfco BERA NAS 08 Day 4	26	7.9	<0.01	
	URS - Gulfco BERA NAS 09 Day 4	26	7.9	0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/15/10	URS - Gulfco BERA CONTROL - NEW Day 5	19 / 19	8.0	0930	HL
	URS - Gulfco BERA CONTROL Day 5	19 / 19	7.7		
	URS - Gulfco BERA NAS 01 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 02 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 03 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 04 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 05 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 06 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 07 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 08 Day 5	19 / 19	7.9		
	URS - Gulfco BERA NAS 09 Day 5	19 / 19	7.9		

Comments:

6a

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/15/10	URS - Gulfco BERA CONTROL - NEW Day 5	25	7.8	0.61	HL
	URS - Gulfco BERA CONTROL Day 5	24	7.9	0.17	
	URS - Gulfco BERA NAS 01 Day 5	25	7.9	0.28	
	URS - Gulfco BERA NAS 02 Day 5	25	7.9	0.34	
	URS - Gulfco BERA NAS 03 Day 5	25	7.9	<0.01	
	URS - Gulfco BERA NAS 04 Day 5	26	7.9	<0.01	
	URS - Gulfco BERA NAS 05 Day 5	26	7.9	<0.01	
	URS - Gulfco BERA NAS 06 Day 5	25	7.9	0.30	
	URS - Gulfco BERA NAS 07 Day 5	25	7.9	<0.01	
	URS - Gulfco BERA NAS 08 Day 5	25	7.9	<0.01	
	URS - Gulfco BERA NAS 09 Day 5	26	7.9	0.19	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/16/10	URS - Gulfco BERA CONTROL - NEW Day 6	19 / 19	7.9	1030	HL
	URS - Gulfco BERA CONTROL Day 6	19 / 19	7.9		
	URS - Gulfco BERA NAS 01 Day 6	19 / 19	7.9		
	URS - Gulfco BERA NAS 02 Day 6	19 / 19	7.9		
	URS - Gulfco BERA NAS 03 Day 6	19 / 19	7.9		
	URS - Gulfco BERA NAS 04 Day 6	19 / 19	7.9		
	URS - Gulfco BERA NAS 05 Day 6	19 / 19	7.9		
	URS - Gulfco BERA NAS 06 Day 6	19 / 19	7.9		
	URS - Gulfco BERA NAS 07 Day 6	19 / 19	7.8		
	URS - Gulfco BERA NAS 08 Day 6	19 / 19	7.8		
	URS - Gulfco BERA NAS 09 Day 6	19 / 19	7.8		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/16/10	URS - Gulfco BERA CONTROL - NEW Day 6	25	7.6	0.08 ①	HL
	URS - Gulfco BERA CONTROL Day 6	25	7.6	<0.01	
	URS - Gulfco BERA NAS 01 Day 6	26	7.6	0.15	
	URS - Gulfco BERA NAS 02 Day 6	25	7.6	0.22	
	URS - Gulfco BERA NAS 03 Day 6	26	7.7	<0.01	
	URS - Gulfco BERA NAS 04 Day 6	26	7.7	<0.01	
	URS - Gulfco BERA NAS 05 Day 6	26	7.7	0.21	
	URS - Gulfco BERA NAS 06 Day 6	26	7.7	<0.01	
	URS - Gulfco BERA NAS 07 Day 6	26	7.7	0.09	
	URS - Gulfco BERA NAS 08 Day 6	26	7.8	0.08	
	URS - Gulfco BERA NAS 09 Day 6	26	7.8	<0.01	

Comments: ① IE HL 9/16/10 → [NA, 0.08, <0.01, 0.15, 0.22]

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/17/10	URS - Gulfco BERA CONTROL - NEW Day 7	19 / 19	8.1	0930	HL
	URS - Gulfco BERA CONTROL Day 7	19 / 19	8.0		
	URS - Gulfco BERA NAS 01 Day 7	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 7	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 7	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 7	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 7	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 7	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 7	19 / 19	7.9		
	URS - Gulfco BERA NAS 08 Day 7	19 / 19	7.9		
	URS - Gulfco BERA NAS 09 Day 7	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/17/10	URS - Gulfco BERA CONTROL - NEW Day 7	25	7.4	<0.01	HL
	URS - Gulfco BERA CONTROL Day 7	25	7.5	<0.01	
	URS - Gulfco BERA NAS 01 Day 7	25	7.5	<0.01	
	URS - Gulfco BERA NAS 02 Day 7	25	7.4	0.09	
	URS - Gulfco BERA NAS 03 Day 7	26	7.4	<0.01	
	URS - Gulfco BERA NAS 04 Day 7	26	7.4	0.25	
	URS - Gulfco BERA NAS 05 Day 7	26	7.5	<0.01	
	URS - Gulfco BERA NAS 06 Day 7	26	7.5	<0.01	
	URS - Gulfco BERA NAS 07 Day 7	26	7.5	0.05	
	URS - Gulfco BERA NAS 08 Day 7	26	7.5	<0.01	
	URS - Gulfco BERA NAS 09 Day 7	26	7.5	0.16	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/18/10	URS - Gulfco BERA CONTROL - NEW Day 8	19 / 19	8.0	1200	SK DK BP
	URS - Gulfco BERA CONTROL Day 8	19 / 19	7.9		
	URS - Gulfco BERA NAS 01 Day 8	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 8	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 8	19 / 19	7.9		
	URS - Gulfco BERA NAS 04 Day 8	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 8	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 8	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 8	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 8	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 8	19 / 19	7.9		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/18/10	URS - Gulfco BERA CONTROL - NEW Day 8	24	7.6	NA	DK SK BP
	URS - Gulfco BERA CONTROL Day 8	24	7.6	0.15	
	URS - Gulfco BERA NAS 01 Day 8	25	7.6	0.34	
	URS - Gulfco BERA NAS 02 Day 8	25	7.6	0.31	
	URS - Gulfco BERA NAS 03 Day 8	25	7.7	0.49	
	URS - Gulfco BERA NAS 04 Day 8	25	7.7	0.65	
	URS - Gulfco BERA NAS 05 Day 8	25	7.7	0.43	
	URS - Gulfco BERA NAS 06 Day 8	25	7.8	0.39	
	URS - Gulfco BERA NAS 07 Day 8	25	7.8	0.36	
	URS - Gulfco BERA NAS 08 Day 8	25	7.8	0.32	
	URS - Gulfco BERA NAS 09 Day 8	25	7.8	0.40	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/19/10	URS - Gulfco BERA CONTROL - NEW Day 9	19 / 19	8.0	1200	DK
	URS - Gulfco BERA CONTROL Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 01 Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 9	19 / 19	7.9		
	URS - Gulfco BERA NAS 03 Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 9	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 9	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/19/10	URS - Gulfco BERA CONTROL - NEW Day 9	25	7.8	NA	DIL
	URS - Gulfco BERA CONTROL Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 01 Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 02 Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 03 Day 9	25	7.7	<0.01	
	URS - Gulfco BERA NAS 04 Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 05 Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 06 Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 07 Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 08 Day 9	25	7.8	<0.01	
	URS - Gulfco BERA NAS 09 Day 9	25	7.8	<0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/20/10	URS - Gulfco BERA CONTROL - NEW Day 10	19 / 19	8.1	0930	HL
	URS - Gulfco BERA CONTROL Day 10	19 / 19	8.1		
	URS - Gulfco BERA NAS 01 Day 10	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 10	19 / 19	8.1		
	URS - Gulfco BERA NAS 03 Day 10	19 / 19	8.1		
	URS - Gulfco BERA NAS 04 Day 10	19 / 19	8.1		
	URS - Gulfco BERA NAS 05 Day 10	19 / 19	8.1		
	URS - Gulfco BERA NAS 06 Day 10	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 10	19 / 19	8.1		
	URS - Gulfco BERA NAS 08 Day 10	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 10	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/20/10	URS - Gulfco BERA CONTROL - NEW Day 10	24	7.7	NA	HL
	URS - Gulfco BERA CONTROL Day 10	25	7.6	0.17	
	URS - Gulfco BERA NAS 01 Day 10	26	7.6	0.65	
	URS - Gulfco BERA NAS 02 Day 10	24	7.7	0.33	
	URS - Gulfco BERA NAS 03 Day 10	23	7.7	0.53	
	URS - Gulfco BERA NAS 04 Day 10	25	7.7	0.47	
	URS - Gulfco BERA NAS 05 Day 10	25	7.7	0.60	
	URS - Gulfco BERA NAS 06 Day 10	25	7.8	<0.01	
	URS - Gulfco BERA NAS 07 Day 10	25	7.9	<0.01	
	URS - Gulfco BERA NAS 08 Day 10	25	7.8	0.43	
	URS - Gulfco BERA NAS 09 Day 10	25	7.7	0.60	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/21/10	URS - Gulfco BERA CONTROL - NEW Day 11	20 / 20	8.1	1000	HL
	URS - Gulfco BERA CONTROL Day 11	20 / 20	7.9		
	URS - Gulfco BERA NAS 01 Day 11	20 / 20	7.9		
	URS - Gulfco BERA NAS 02 Day 11	20 / 20	7.9		
	URS - Gulfco BERA NAS 03 Day 11	20 / 20	7.9		
	URS - Gulfco BERA NAS 04 Day 11	20 / 20	7.9		
	URS - Gulfco BERA NAS 05 Day 11	20 / 20	7.9		
	URS - Gulfco BERA NAS 06 Day 11	20 / 20	8.0		
	URS - Gulfco BERA NAS 07 Day 11	20 / 20	7.9		
	URS - Gulfco BERA NAS 08 Day 11	20 / 20	8.0		
	URS - Gulfco BERA NAS 09 Day 11	20 / 20	7.9		

Comments: ① IE HL 9/16/10 → [12a]

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/21/10	URS - Gulfco BERA CONTROL - NEW Day 11	25	7.7	~~<0.01~~ 0	HL
	URS - Gulfco BERA CONTROL Day 11	25	7.8	<0.01	
	URS - Gulfco BERA NAS 01 Day 11	25	7.8	<0.01	
	URS - Gulfco BERA NAS 02 Day 11	25	7.8	<0.01	
	URS - Gulfco BERA NAS 03 Day 11	25	7.8	<0.01	
	URS - Gulfco BERA NAS 04 Day 11	25	7.9	0.07	
	URS - Gulfco BERA NAS 05 Day 11	25	7.9	0.01	
	URS - Gulfco BERA NAS 06 Day 11	25	7.8	<0.01	
	URS - Gulfco BERA NAS 07 Day 11	25	7.8	<0.01	
	URS - Gulfco BERA NAS 08 Day 11	25	7.9	<0.01	
	URS - Gulfco BERA NAS 09 Day 11	26	7.9	<0.01	

Comments: DIE HL 9/21/10 → [NA]

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/22/10	URS - Gulfco BERA CONTROL - NEW Day 12	19 / 19	8.1	0930	HL
	URS - Gulfco BERA CONTROL Day 12	19 / 19	8.0		
	URS - Gulfco BERA NAS 01 Day 12	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 12	19 / 19	8.1		
	URS - Gulfco BERA NAS 03 Day 12	19 / 19	8.1		
	URS - Gulfco BERA NAS 04 Day 12	19 / 19	8.1		
	URS - Gulfco BERA NAS 05 Day 12	19 / 19	8.1		
	URS - Gulfco BERA NAS 06 Day 12	19 / 19	8.1		
	URS - Gulfco BERA NAS 07 Day 12	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 12	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 12	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/22/10	URS - Gulfco BERA CONTROL - NEW Day 21	24	7.6	<0.01	HL
	URS - Gulfco BERA CONTROL Day 21	25	7.6	0.04	
	URS - Gulfco BERA NAS 01 Day 21	24	7.6	<0.01	
	URS - Gulfco BERA NAS 02 Day 21	24	7.7	0.06	
	URS - Gulfco BERA NAS 03 Day 21	25	7.7	0.09	
	URS - Gulfco BERA NAS 04 Day 21	25	7.7	<0.01	
	URS - Gulfco BERA NAS 05 Day 21	25	7.7	0.02	
	URS - Gulfco BERA NAS 06 Day 21	25	7.6	<0.01	
	URS - Gulfco BERA NAS 07 Day 21	25	7.6	<0.01	
	URS - Gulfco BERA NAS 08 Day 21	25	7.6	<0.01	
	URS - Gulfco BERA NAS 09 Day 21	25	7.6	0.02	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/23/10	URS - Gulfco BERA CONTROL - NEW Day 13	19 / 19	8.0	1000	HL
	URS - Gulfco BERA CONTROL Day 13	19 / 19	7.9		
	URS - Gulfco BERA NAS 01 Day 13	19 / 19	7.9		
	URS - Gulfco BERA NAS 02 Day 13	19 / 19	7.9		
	URS - Gulfco BERA NAS 03 Day 13	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 13	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 13	19 / 19	7.9		
	URS - Gulfco BERA NAS 06 Day 13	19 / 19	7.9		
	URS - Gulfco BERA NAS 07 Day 13	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 13	19 / 19	7.9		
	URS - Gulfco BERA NAS 09 Day 13	19 / 19	8.1		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/23/10	URS - Gulfco BERA CONTROL - NEW Day 13	24	7.6	NA	HC
	URS - Gulfco BERA CONTROL Day 13	24	7.4	0.05	
	URS - Gulfco BERA NAS 01 Day 13	24	7.4	0.76	
	URS - Gulfco BERA NAS 02 Day 13	24	7.4	0.02	
	URS - Gulfco BERA NAS 03 Day 13	24	7.5	0.69	
	URS - Gulfco BERA NAS 04 Day 13	25	7.5	0.64	
	URS - Gulfco BERA NAS 05 Day 13	24	7.5	<0.01	
	URS - Gulfco BERA NAS 06 Day 13	24	7.5	<0.01	
	URS - Gulfco BERA NAS 07 Day 13	24	7.5	<0.01	
	URS - Gulfco BERA NAS 08 Day 13	24	7.5	0.07	
	URS - Gulfco BERA NAS 09 Day 13	25	7.5	0.27	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/24/10	URS - Gulfco BERA CONTROL - NEW Day 14	19 / 19	7.9	0930	HL
	URS - Gulfco BERA CONTROL Day 14	19 / 19	7.8		
	URS - Gulfco BERA NAS 01 Day 14	19 / 19	7.9		
	URS - Gulfco BERA NAS 02 Day 14	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 14	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 14	19 / 19	7.9		
	URS - Gulfco BERA NAS 05 Day 14	19 / 19	7.9		
	URS - Gulfco BERA NAS 06 Day 14	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 14	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 14	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 14	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/24/10	URS - Gulfco BERA CONTROL - NEW Day 14	~~23~~ ①	7.8	NA	HL
	URS - Gulfco BERA CONTROL Day 14	24	7.8	<0.01	
	URS - Gulfco BERA NAS 01 Day 14	24	7.7	0.15	
	URS - Gulfco BERA NAS 02 Day 14	24	7.7	0.04	
	URS - Gulfco BERA NAS 03 Day 14	24	7.7	0.11	
	URS - Gulfco BERA NAS 04 Day 14	24	7.7	0.16	
	URS - Gulfco BERA NAS 05 Day 14	24	7.7	0.15	
	URS - Gulfco BERA NAS 06 Day 14	24	7.7	<0.01	
	URS - Gulfco BERA NAS 07 Day 14	24	7.7	<0.01	
	URS - Gulfco BERA NAS 08 Day 14	25	7.7	0.01	
	URS - Gulfco BERA NAS 09 Day 14	25	7.7	<0.01	

Comments: ① IE HL 9/24/10 → [25]

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/25/10	URS - Gulfco BERA CONTROL - NEW Day 15	19 / 19	8.0	1230	DK
	URS - Gulfco BERA CONTROL Day 15	19 / 19	8.0		
	URS - Gulfco BERA NAS 01 Day 15	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 15	19 / 19	7.9		
	URS - Gulfco BERA NAS 03 Day 15	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 15	19 / 19	7.9		
	URS - Gulfco BERA NAS 05 Day 15	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 15	19 / 19	7.8		
	URS - Gulfco BERA NAS 07 Day 15	19 / 19	7.9		
	URS - Gulfco BERA NAS 08 Day 15	19 / 19	7.9		
	URS - Gulfco BERA NAS 09 Day 15	19 / 19	8.1		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/25/10	URS - Gulfco BERA CONTROL - NEW Day 15	25	7.7	NA	DK
	URS - Gulfco BERA CONTROL Day 15	26	7.7	<0.01	
	URS - Gulfco BERA NAS 01 Day 15	26	7.7	0.08	
	URS - Gulfco BERA NAS 02 Day 15	26	7.8	<0.01	
	URS - Gulfco BERA NAS 03 Day 15	26	7.8	0.04	
	URS - Gulfco BERA NAS 04 Day 15	26	7.7	0.09	
	URS - Gulfco BERA NAS 05 Day 15	26	7.7	<0.01	
	URS - Gulfco BERA NAS 06 Day 15	26	7.4	<0.01	
	URS - Gulfco BERA NAS 07 Day 15	26	7.7	<0.01	
	URS - Gulfco BERA NAS 08 Day 15	26	7.8	<0.01	
	URS - Gulfco BERA NAS 09 Day 15	26	7.7	<0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/26/10	URS - Gulfco BERA CONTROL - NEW Day 16	19 / 19	8.0	1300	DK
	URS - Gulfco BERA CONTROL Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 01 Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 16	19 / 19	7.9		
	URS - Gulfco BERA NAS 06 Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 16	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 16	19 / 19	8.1		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/26/10	URS - Gulfco BERA CONTROL - NEW Day 16	24	8.1	NA	DK LS
	URS - Gulfco BERA CONTROL Day 16	24	8.1	<0.01	
	URS - Gulfco BERA NAS 01 Day 16	24	8.1	0.12	
	URS - Gulfco BERA NAS 02 Day 16	24	8.1	<0.01	
	URS - Gulfco BERA NAS 03 Day 16	24	8.2	<0.01	
	URS - Gulfco BERA NAS 04 Day 16	24	8.2	0.08	
	URS - Gulfco BERA NAS 05 Day 16	24	8.2	<0.01	
	URS - Gulfco BERA NAS 06 Day 16	24	8.1	<0.01	
	URS - Gulfco BERA NAS 07 Day 16	24	8.0	<0.01	
	URS - Gulfco BERA NAS 08 Day 16	24	8.1	<0.01	
	URS - Gulfco BERA NAS 09 Day 16	24	8.1	<0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/27/10	URS - Gulfco BERA CONTROL - NEW Day 17	19 / 19	8.2	1000	HL
	URS - Gulfco BERA CONTROL Day 17	19 / 19	8.2		
	URS - Gulfco BERA NAS 01 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 02 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 03 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 04 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 05 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 06 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 07 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 08 Day 17	19 / 19	8.1		
	URS - Gulfco BERA NAS 09 Day 17	19 / 19	8.2		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/27/10	URS - Gulfco BERA CONTROL - NEW Day 17	24	7.7	NA	HL
	URS - Gulfco BERA CONTROL Day 17	24	7.7	0.22	
	URS - Gulfco BERA NAS 01 Day 17	24	7.7	0.78	
	URS - Gulfco BERA NAS 02 Day 17	24	7.7	0.19	
	URS - Gulfco BERA NAS 03 Day 17	24	7.8	0.48	
	URS - Gulfco BERA NAS 04 Day 17	24	7.8	0.57	
	URS - Gulfco BERA NAS 05 Day 17	24	7.8	0.69	
	URS - Gulfco BERA NAS 06 Day 17	24	7.8	0.22	
	URS - Gulfco BERA NAS 07 Day 17	24	7.8	0.33	
	URS - Gulfco BERA NAS 08 Day 17	24	7.8	0.18	
	URS - Gulfco BERA NAS 09 Day 17	25	7.8	0.25	

Comments:

18b

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/28/10	URS - Gulfco BERA CONTROL - NEW Day 18	19 / 19	7.9	1030	HL
	URS - Gulfco BERA CONTROL Day 18	19 / 19	7.9		
	URS - Gulfco BERA NAS 01 Day 18	19 / 19	7.9		
	URS - Gulfco BERA NAS 02 Day 18	19 / 19	7.9		
	URS - Gulfco BERA NAS 03 Day 18	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 18	19 / 19	7.9		
	URS - Gulfco BERA NAS 05 Day 18	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 18	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 18	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 18	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 18	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/28/10	URS - Gulfco BERA CONTROL - NEW Day 18	24	7.6	NA	HL
	URS - Gulfco BERA CONTROL Day 18	25	7.7	<0.01	
	URS - Gulfco BERA NAS 01 Day 18	25	7.7	0.02	
	URS - Gulfco BERA NAS 02 Day 18	25	7.7	<0.01	
	URS - Gulfco BERA NAS 03 Day 18	25	7.8	<0.01	
	URS - Gulfco BERA NAS 04 Day 18	25	7.8	0.03	
	URS - Gulfco BERA NAS 05 Day 18	24	7.8	<0.01	
	URS - Gulfco BERA NAS 06 Day 18	25	7.8	<0.01	
	URS - Gulfco BERA NAS 07 Day 18	25	7.8	<0.01	
	URS - Gulfco BERA NAS 08 Day 18	25	7.8	<0.01	
	URS - Gulfco BERA NAS 09 Day 18	25	7.8	0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/29/10	URS - Gulfco BERA CONTROL - NEW Day 19	19 / 19	8.1	1000	HC
	URS - Gulfco BERA CONTROL Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 01 Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 19	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 19	19 / 19	8.1		
	URS - Gulfco BERA NAS 09 Day 19	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/29/10	URS - Gulfco BERA CONTROL - NEW Day 19	24	7.4	NA	HL
	URS - Gulfco BERA CONTROL Day 19	25	7.3	<0.01	
	URS - Gulfco BERA NAS 01 Day 19	24	7.3	<0.01	
	URS - Gulfco BERA NAS 02 Day 19	25	7.3	<0.01	
	URS - Gulfco BERA NAS 03 Day 19	25	7.3	<0.01	
	URS - Gulfco BERA NAS 04 Day 19	25	7.3	<0.01	
	URS - Gulfco BERA NAS 05 Day 19	25	7.3	<0.01	
	URS - Gulfco BERA NAS 06 Day 19	25	7.4	<0.01	
	URS - Gulfco BERA NAS 07 Day 19	25	7.5	<0.01	
	URS - Gulfco BERA NAS 08 Day 19	25	7.5	<0.01	
	URS - Gulfco BERA NAS 09 Day 19	25	7.5	<0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
9/30/10	URS - Gulfco BERA CONTROL - NEW Day 20	19 / 19	7.9	0930	HL
	URS - Gulfco BERA CONTROL Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 01 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 04 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 05 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 06 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 20	19 / 19	8.0		
	URS - Gulfco BERA NAS 09 Day 20	19 / 19	8.0		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
9/30/10	URS - Gulfco BERA CONTROL - NEW Day 20	24	8.0	NA	HL
	URS - Gulfco BERA CONTROL Day 20	24	8.0	<0.01	
	URS - Gulfco BERA NAS 01 Day 20	24	8.0	0.01	
	URS - Gulfco BERA NAS 02 Day 20	24	8.0	<0.01	
	URS - Gulfco BERA NAS 03 Day 20	24	8.0	<0.01	
	URS - Gulfco BERA NAS 04 Day 20	24	8.0	<0.01	
	URS - Gulfco BERA NAS 05 Day 20	25	8.1	<0.01	
	URS - Gulfco BERA NAS 06 Day 20	25	8.1	<0.01	
	URS - Gulfco BERA NAS 07 Day 20	24	8.0	<0.01	
	URS - Gulfco BERA NAS 08 Day 20	25	8.0	<0.01	
	URS - Gulfco BERA NAS 09 Day 20	25	8.0	<0.01	

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Temp. °C (actual/corrected)	pH	Time	Init.
10/1/10	URS - Gulfco BERA CONTROL Day 21	19 / 19	8.0	0900	HL
	URS - Gulfco BERA NAS 01 Day 21	19 / 19	8.0		
	URS - Gulfco BERA NAS 02 Day 21	19 / 19	8.0		
	URS - Gulfco BERA NAS 03 Day 21	19 / 19	8.1		
	URS - Gulfco BERA NAS 04 Day 21	19 / 19	8.1		
	URS - Gulfco BERA NAS 05 Day 21	19 / 19	8.1		
	URS - Gulfco BERA NAS 06 Day 21	19 / 19	8.0		
	URS - Gulfco BERA NAS 07 Day 21	19 / 19	8.0		
	URS - Gulfco BERA NAS 08 Day 21	19 / 19	8.1		
	URS - Gulfco BERA NAS 09 Day 21	19 / 19	8.1		

Comments:

WET CHEMISTRY LOG- Special Projects - 21d N. arenaceodentata

Date	Client/ Sample No./Sample Date	Sal. ‰	D.O. mg/L	NH_3N ppm*	Init.
10/1/10	URS - Gulfco BERA CONTROL Day 21	25	7.7	<0.01	HL
	URS - Gulfco BERA NAS 01 Day 21	24	7.7	<0.01	
	URS - Gulfco BERA NAS 02 Day 21	25	7.7	<0.01	
	URS - Gulfco BERA NAS 03 Day 21	25	7.7	<0.01	
	URS - Gulfco BERA NAS 04 Day 21	25	7.7	<0.01	
	URS - Gulfco BERA NAS 05 Day 21	25	7.8	<0.01	
	URS - Gulfco BERA NAS 06 Day 21	25	7.8	<0.01	
	URS - Gulfco BERA NAS 07 Day 21	25	7.8	<0.01	
	URS - Gulfco BERA NAS 08 Day 21	25	7.8	<0.01	
	URS - Gulfco BERA NAS 09 Day 21	25	7.8	<0.01	

Comments:

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 9/10/10 TEST NUMBER: 9/10/10 DURATION: 96 H
TOXICANT : CdCl2
SPECIES: Neanthes arenaceodenta

RAW DATA: ---	Concentration (mg/l)	Number Exposed	Mortalities
	.00	9	1
	4.80	9	0
	6.30	9	1
	8.40	9	8
	11.20	9	9
	15.00	9	9
	20.00	9	9

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 7.40
95% LOWER CONFIDENCE: 6.86
95% UPPER CONFIDENCE: 7.99

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

Client	PBS&J STOX - CdCl2	Login No.		PBS&J Job No.	470001.00 0400

96 h Acute *Neanthes arenaceodentata* Toxicity Test Condition Summary Test Method ASTM E 1611			
Test Organism:	*Neanthes arenaceodentata*	Age Class:	2-3 wk old juveniles
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	20 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 ml plastic cup	Cleaning:	None
No. of Replicates:	3	No. organisms per Replicate:	3 (minimum)
Test Solution Volume	30 mL (minimum)	Dilution Water:	LAB-W (20 ppt)
Renewal of test solution:	None	Aeration:	None
Feeding:	NA	Food Type:	N/A
Acceptability Criteria	≥ 90% survival in control	Sampling Holding Time	N/A

Test Organism Batch #	10-00889	DOB	~~NA~~ ①
Source	California State U. Long Beach	Age (days) / Size	NA

Test Concentrations (mg/L):	Control, 4.8, 6.3, 8.4, 11.2, 15.0, 20.0	Critical Dilution	NA

STOX Solution 1 Date/Time/Initials:	9/10/10	1230	HJ	STOX Solution 3 Date/Time/Initials:	NA		
STOX Solution 2 Date/Time/Initials:	NA			STOX Solution 4 Date/Time/Initials:	NA		

Hour	Date	Time	Initials	Day	Date	Time	Initials
0 h Initiation	9/10/10	1530	HL/RB	72 h Counts	9/13/10	1530	RB
24 h Counts	9/11/10	1530	DL	96 h Termination	9/14/10	1430	SK
48 h Counts	9/12/10	1500	DL		NA	NA	NA

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments: ① IE RB 9/10/10 → [2-3 wks]

Susan Gregory
Final Review Signature

HJ / HJ
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

Client	PBS&J STOX - CdCl2	Login No:		PBS&J Job No.	470001.00 0400

Acute Toxicity Test with *Neanthes arenaceodentata*

Conc. (mg/L)	Rep.	No. of Surviving Organisms					Conc. (mg/L)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	3	3	3	3	2	11.2	A	3	2	0	0	0
	B	3	3	3	3	3		B	3	2	1	0	0
	C	3	3	3	3	3		C	3	2	1	0	0
	D							D					
	E							E					
4.8	A	3	3	3	3	3	15.0	A	3	0	0	0	0
	B	3	3	3	3	3		B	3	0	0	0	0
	C	3	3	3	3	3		C	3	0	0	0	0
	D							D					
	E							E					
6.3	A	3	3	3	3	2	20.0	A	3	0	0	0	0
	B	3	3	3	3	3		B	3	0	0	0	0
	C	3	3	3	3	3		C	3	0	0	0	0
	D							D					
	E							E					
8.4	A	3	3	3	2	0		A					
	B	3	2	2	1	0		B					
	C	3	3	3	1	1		C					
	D							D					
	E							E					

Comments:

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

HT / HS
Initial Review

Client	PBS&J STOX - CdCl2	Login No.		PBS&J Job No.	470001.00 0400

Water Quality Parameters -*Neanthes arenaceodentata*

Conc. (mg/L)	pH	
	0 hr	96 hr
Rep	A	E
Cont.	7.9	7.8
4.8	7.9	7.8
6.3	8.0	7.8
8.4	8.0	7.8
11.2	8.0	7.8
15.0	8.0	7.8
20.0	8.0	7.8
Meter No.	765	765
Time	1230	1430
Initials	HJ SK	BR SK

Conc. (mg/L)	Dissolved Oxygen (mg/L)	
	0 hr	96 hr
Rep	A	E
Cont.	8.0	7.3
4.8	8.0	7.3
6.3	8.1	7.3
8.4	8.2	7.3
11.2	8.3	7.3
15.0	8.3	7.4
20.0	8.4	7.4
Meter No.	735	735
Time	1230	1430
Initials	HJ SK	BR SK

Comments:

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

HJ / HJ
Initial Review

Client	PBS&J STOX - CdCl2	Login No.		PBS&J Job No.	470001.00 0400

Water Quality Parameters -*Neanthes arenaceodentata*

Conc. (mg/L)	Temperature °C	
	0 hr	96 hr
Rep	A	E
Cont.	20/21	21 / 22
4.8	20/21	21 / 22
6.3	20/21	21 / 22
8.4	20/21	21 / 22
11.2	20/21	21 / 22
15.0	20/21	21 / 22
20.0	20/21	21 / 22
Therm. No.	T-81	T-81
Time	1230	1430
Initials	HJ SK	SK

Conc. (mg/L)	Salinity (‰)	
	0 hr	96 hr
Cont.	24	24
4.8	25	25
6.3	25	25
8.4	24	24
11.2	23	23
15.0	22	22
20.0	21	21
Meter No.	755	755
Time	1230	1430
Initials	HJ RB	SK

Comments:

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

HJ / HJ
Initial Review

Appendix C

Statistical Analyses

CETIS Analytical Report

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	05-1830-7015	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:03	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Batch ID:	13-0329-4912	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	10 Sep-10 13:00	**Protocol:**	ASTM E1611-00 (2000)	**Diluent:**	Laboratory Seawater
Ending Date:		**Species:**	Neanthes arenaceodentata	**Brine:**	HW-Marinemix
Duration:	N/A	**Source:**	Cal State Univ. Long Beach	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
64B810E3	16-8978-4547	08 Sep-10	09 Sep-10	61h	URS Corp	100016848
2F8DB23	00-4986-3459	13 Aug-10 12:32	13 Aug-10 16:02	28d 0h		
35ED0318	09-0472-5272	16 Aug-10 15:28	17 Aug-10 12:30	24d 22h		
634EFACF	16-6612-0399	16 Aug-10 16:00	17 Aug-10 12:30	24d 21h		
28602B1E	06-7739-1134	16 Aug-10 16:36	17 Aug-10 12:30	24d 20h		
1CD8C95F	04-8396-9375	16 Aug-10 16:18	17 Aug-10 12:30	24d 21h		
31E0E5B3	08-3682-2451	16 Aug-10 17:00	17 Aug-10 12:30	24d 20h		
64BB680B	16-9000-3467	17 Aug-10 09:00	17 Aug-10 12:30	24d 4h		
196479DF	04-2601-5199	17 Aug-10 09:31	17 Aug-10 12:30	24d 3h		
141B370A	03-3732-7882	17 Aug-10 10:02	17 Aug-10 12:30	24d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
64B810E3	Control Sediment	Gulfco Marine - BERA	York River, VA		
2F8DB23	Test Sediment	Gulfco Marine - BERA	NAS-01		
35ED0318	Test Sediment	Gulfco Marine - BERA	NAS-02		
634EFACF	Test Sediment	Gulfco Marine - BERA	NAS-03		
28602B1E	Test Sediment	Gulfco Marine - BERA	NAS-04		
1CD8C95F	Test Sediment	Gulfco Marine - BERA	NAS-05		
31E0E5B3	Test Sediment	Gulfco Marine - BERA	NAS-06		
64BB680B	Test Sediment	Gulfco Marine - BERA	NAS-07		
196479DF	Test Sediment	Gulfco Marine - BERA	NAS-08		
141B370A	Test Sediment	Gulfco Marine - BERA	NAS-09		

Batch Note: Test was 21d duration, per work-scope agreement.

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					24.6%

Dunnett's Multiple Comparison Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
64B810E3		2F8DB23	2.317	2.506	8	0.2938	0.0744	Non-Significant Effect
		35ED0318	1.219	2.506	8	0.2938	0.4202	Non-Significant Effect
		634EFACF	0.4063	2.506	8	0.2938	0.7827	Non-Significant Effect
		28602B1E	1.596	2.506	8	0.2938	0.2605	Non-Significant Effect
		1CD8C95F	2.317	2.506	8	0.2938	0.0744	Non-Significant Effect
		31E0E5B3	1.219	2.506	8	0.2938	0.4202	Non-Significant Effect
		64BB680B	0.8125	2.506	8	0.2938	0.6123	Non-Significant Effect
		196479DF	3.506	2.506	8	0.2938	0.0042	Significant Effect
		141B370A	3.85	2.506	8	0.2938	0.0016	Significant Effect

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	05-1830-7015	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:03	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.9939352	0.1104372	9	3.214	0.0051	Significant Effect
Error	1.374281	0.03435702	40			
Total	2.368216	0.1447943	49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2.788	3.067	0.0167	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9719	0.9367	0.2760	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.08322	0.1453	0.4953	Normal Distribution
Distribution	D'Agostino Skewness	0.9149	2.576	0.3602	Normal Distribution
Distribution	D'Agostino Kurtosis	0.4794	2.576	0.6316	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	1.067	9.21	0.5866	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.3312	3.878	0.5245	Normal Distribution

Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	1	1	1	1	1	0	0	0.0%	0.0%
2F8DB23	5	0.76	0.6608	0.8592	0.4	1	0.1166	0.2608	34.31%	24.0%
35ED0318	5	0.88	0.8383	0.9217	0.8	1	0.04899	0.1095	12.45%	12.0%
634EFACF	5	0.96	0.926	0.994	0.8	1	0.04	0.08944	9.32%	4.0%
28602B1E	5	0.84	0.7764	0.9036	0.6	1	0.07483	0.1673	19.92%	16.0%
1CD8C95F	5	0.76	0.6608	0.8592	0.4	1	0.1166	0.2608	34.31%	24.0%
31E0E5B3	5	0.88	0.8383	0.9217	0.8	1	0.04899	0.1095	12.45%	12.0%
64BB680B	5	0.92	0.8783	0.9617	0.8	1	0.04899	0.1095	11.91%	8.0%
196479DF	5	0.64	0.5764	0.7036	0.4	0.8	0.07483	0.1673	26.15%	36.0%
141B370A	5	0.6	0.5239	0.6761	0.4	0.8	0.08944	0.2	33.33%	40.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
2F8DB23	5	1.074	0.9636	1.184	0.6847	1.345	0.1294	0.2895	26.96%	20.19%
35ED0318	5	1.202	1.153	1.252	1.107	1.345	0.05833	0.1304	10.85%	10.62%
634EFACF	5	1.298	1.257	1.338	1.107	1.345	0.04763	0.1065	8.21%	3.54%
28602B1E	5	1.158	1.085	1.232	0.8861	1.345	0.08639	0.1932	16.68%	13.91%
1CD8C95F	5	1.074	0.9636	1.184	0.6847	1.345	0.1294	0.2895	26.96%	20.19%
31E0E5B3	5	1.202	1.153	1.252	1.107	1.345	0.05833	0.1304	10.85%	10.62%
64BB680B	5	1.25	1.2	1.3	1.107	1.345	0.05833	0.1304	10.43%	7.08%
196479DF	5	0.9342	0.8665	1.002	0.6847	1.107	0.07959	0.178	19.05%	30.55%
141B370A	5	0.894	0.8136	0.9743	0.6847	1.107	0.09448	0.2113	23.63%	33.55%

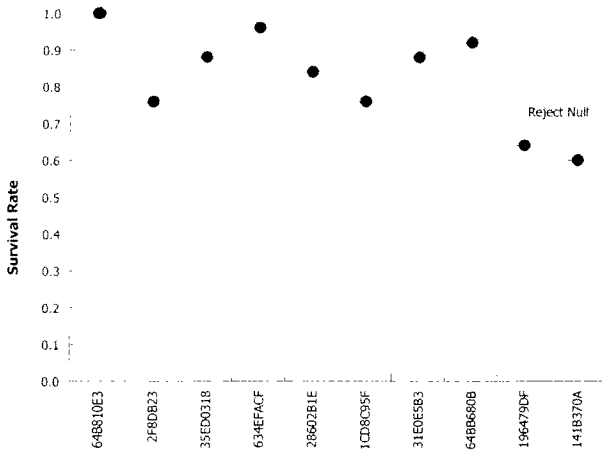
Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

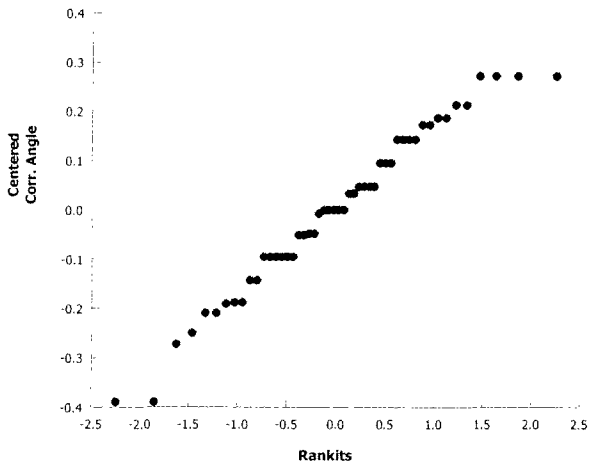
Analysis ID:	05-1830-7015	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:03	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Survival Rate Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
64B810E3	1	1	1	1	1
2F8DB23	0.6	1	0.4	0.8	1
35ED0318	1	0.8	1	0.8	0.8
634EFACF	1	0.8	1	1	1
28602B1E	0.6	1	0.8	1	0.8
1CD8C95F	0.8	1	0.4	0.6	1
31E0E5B3	0.8	1	1	0.8	0.8
64BB680B	1	1	0.8	1	0.8
196479DF	0.6	0.4	0.8	0.6	0.8
141B370A	0.4	0.8	0.6	0.4	0.8

Graphics





Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	01-7680-5971	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:03	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Batch ID:	13-0329-4912	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	10 Sep-10 13:00	**Protocol:**	ASTM E1611-00 (2000)	**Diluent:**	Laboratory Seawater
Ending Date:		**Species:**	Neanthes arenaceodentata	**Brine:**	HW-Marinemix
Duration:	N/A	**Source:**	Cal State Univ. Long Beach	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
64B810E3	16-8978-4547	08 Sep-10	09 Sep-10	61h	URS Corp	100016848
2F8DB23	00-4986-3459	13 Aug-10 12:32	13 Aug-10 16:02	28d 0h		
35ED0318	09-0472-5272	16 Aug-10 15:28	17 Aug-10 12:30	24d 22h		
634EFACF	16-6612-0399	16 Aug-10 16:00	17 Aug-10 12:30	24d 21h		
28602B1E	06-7739-1134	16 Aug-10 16:36	17 Aug-10 12:30	24d 20h		
1CD8C95F	04-8396-9375	16 Aug-10 16:18	17 Aug-10 12:30	24d 21h		
31E0E5B3	08-3682-2451	16 Aug-10 17:00	17 Aug-10 12:30	24d 20h		
64BB680B	16-9000-3467	17 Aug-10 09:00	17 Aug-10 12:30	24d 4h		
196479DF	04-2601-5199	17 Aug-10 09:31	17 Aug-10 12:30	24d 3h		
141B370A	03-3732-7882	17 Aug-10 10:02	17 Aug-10 12:30	24d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
64B810E3	Control Sediment	Gulfco Marine - BERA	York River, VA		
2F8DB23	Test Sediment	Gulfco Marine - BERA	NAS-01		
35ED0318	Test Sediment	Gulfco Marine - BERA	NAS-02		
634EFACF	Test Sediment	Gulfco Marine - BERA	NAS-03		
28602B1E	Test Sediment	Gulfco Marine - BERA	NAS-04		
1CD8C95F	Test Sediment	Gulfco Marine - BERA	NAS-05		
31E0E5B3	Test Sediment	Gulfco Marine - BERA	NAS-06		
64BB680B	Test Sediment	Gulfco Marine - BERA	NAS-07		
196479DF	Test Sediment	Gulfco Marine - BERA	NAS-08		
141B370A	Test Sediment	Gulfco Marine - BERA	NAS-09		

Batch Note: Test was 21d duration, per work-scope agreement.

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					47.7%

Dunnett's Multiple Comparison Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
64B810E3		2F8DB23	2.748	2.506	8	0.9821	0.0291	Significant Effect
		35ED0318	-0.8904	2.506	8	0.9821	0.9910	Non-Significant Effect
		634EFACF	-1.648	2.506	8	0.9821	0.9994	Non-Significant Effect
		28602B1E	-8.586	2.506	8	0.9821	1.0000	Non-Significant Effect
		1CD8C95F	-1.62	2.506	8	0.9821	0.9994	Non-Significant Effect
		31E0E5B3	0.4183	2.506	8	0.9821	0.7783	Non-Significant Effect
		64BB680B	0.9695	2.506	8	0.9821	0.5382	Non-Significant Effect
		196479DF	2.476	2.506	8	0.9821	0.0534	Non-Significant Effect
		141B370A	2.748	2.506	8	0.9821	0.0290	Significant Effect

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	01-7680-5971	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:03	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	77.57763	8.619737	9	22.46	<0.0001	Significant Effect
Error	15.35432	0.3838581	40			
Total	92.93195	9.003594	49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	13.57	21.67	0.1385	Equal Variances
Variances	Mod Levene Equality of Variance	1.183	3.067	0.3408	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9511	0.9367	0.0377	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1105	0.1453	0.1264	Normal Distribution
Distribution	D'Agostino Skewness	2.68	2.576	0.0074	Non-normal Distribution
Distribution	D'Agostino Kurtosis	2.312	2.576	0.0208	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	12.52	9.21	0.0019	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	0.6844	3.878	0.0739	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	2.058	1.899	2.218	1.454	2.564	0.1876	0.4195	20.38%	0.0%
2F8DB23	5	0.9817	0.8018	1.162	0.58	1.603	0.2114	0.4728	48.16%	52.31%
35ED0318	5	2.407	2.263	2.551	1.94	2.91	0.1693	0.3786	15.73%	-16.95%
634EFACF	5	2.704	2.502	2.907	1.918	3.358	0.2379	0.5319	19.67%	-31.38%
28602B1E	5	5.423	5.252	5.593	4.78	5.925	0.2002	0.4477	8.26%	-163.4%
1CD8C95F	5	2.693	2.209	3.177	1.517	4.653	0.569	1.272	47.25%	-30.83%
31E0E5B3	5	1.894	1.628	2.161	1.27	3.097	0.3138	0.7017	37.04%	7.96%
64BB680B	5	1.679	1.494	1.863	1.193	2.45	0.2169	0.4849	28.89%	18.46%
196479DF	5	1.088	0.9857	1.191	0.69	1.36	0.1205	0.2695	24.76%	47.14%
141B370A	5	0.9815	0.7429	1.22	0.45	2.07	0.2805	0.6272	63.9%	52.32%

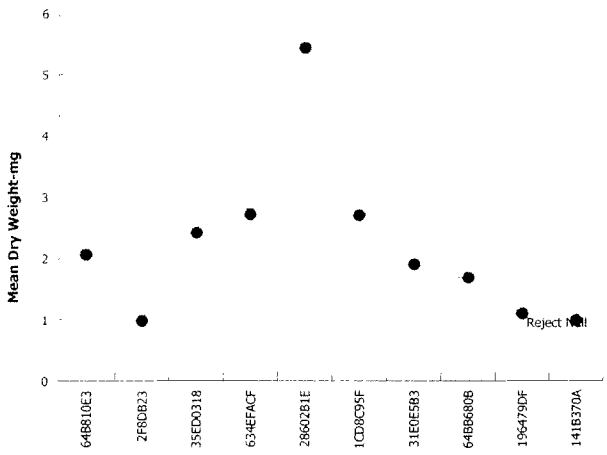
Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

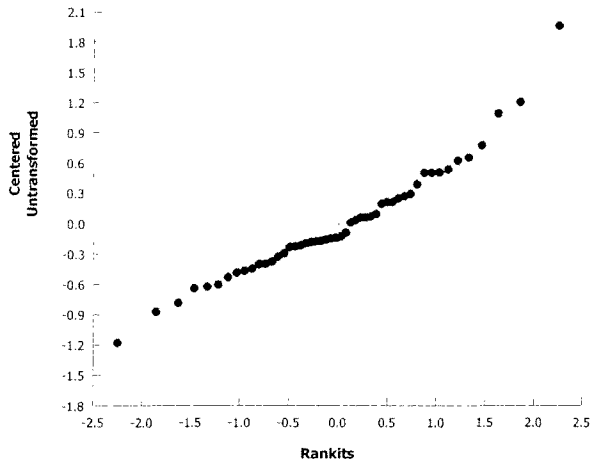
Analysis ID:	01-7680-5971	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:03	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
64B810E3	2.564	2.27	1.876	1.454	2.128
2F8DB23	1.603	0.58	1.37	0.605	0.75
35ED0318	2.656	2.262	2.268	2.91	1.94
634EFACF	1.918	2.528	3.358	2.918	2.8
28602B1E	5.717	4.78	5.208	5.484	5.925
1CD8C95F	4.653	2.248	3.23	1.517	1.818
31E0E5B3	1.27	1.7	1.6	1.805	3.097
64BB680B	1.712	1.688	2.45	1.35	1.193
196479DF	1.283	0.96	0.69	1.36	1.147
141B370A	2.07	0.8225	0.81	0.45	0.755

Graphics





Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	07-9275-2912	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:02	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Batch ID:	13-0329-4912	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	10 Sep-10 13:00	**Protocol:**	ASTM E1611-00 (2000)	**Diluent:**	Laboratory Seawater
Ending Date:		**Species:**	Neanthes arenaceodentata	**Brine:**	HW-Marinemix
Duration:	N/A	**Source:**	Cal State Univ. Long Beach	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
64B810E3	16-8978-4547	08 Sep-10	09 Sep-10	61h	URS Corp	100016848
2F8DB23	00-4986-3459	13 Aug-10 12:32	13 Aug-10 16:02	28d 0h		
35ED0318	09-0472-5272	16 Aug-10 15:28	17 Aug-10 12:30	24d 22h		
634EFACF	16-6612-0399	16 Aug-10 16:00	17 Aug-10 12:30	24d 21h		
28602B1E	06-7739-1134	16 Aug-10 16:36	17 Aug-10 12:30	24d 20h		
1CD8C95F	04-8396-9375	16 Aug-10 16:18	17 Aug-10 12:30	24d 21h		
31E0E5B3	08-3682-2451	16 Aug-10 17:00	17 Aug-10 12:30	24d 20h		
64BB680B	16-9000-3467	17 Aug-10 09:00	17 Aug-10 12:30	24d 4h		
196479DF	04-2601-5199	17 Aug-10 09:31	17 Aug-10 12:30	24d 3h		
141B370A	03-3732-7882	17 Aug-10 10:02	17 Aug-10 12:30	24d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
64B810E3	Control Sediment	Gulfco Marine - BERA	York River, VA		
2F8DB23	Test Sediment	Gulfco Marine - BERA	NAS-01		
35ED0318	Test Sediment	Gulfco Marine - BERA	NAS-02		
634EFACF	Test Sediment	Gulfco Marine - BERA	NAS-03		
28602B1E	Test Sediment	Gulfco Marine - BERA	NAS-04		
1CD8C95F	Test Sediment	Gulfco Marine - BERA	NAS-05		
31E0E5B3	Test Sediment	Gulfco Marine - BERA	NAS-06		
64BB680B	Test Sediment	Gulfco Marine - BERA	NAS-07		
196479DF	Test Sediment	Gulfco Marine - BERA	NAS-08		
141B370A	Test Sediment	Gulfco Marine - BERA	NAS-09		

Batch Note: Test was 21d duration, per work-scope agreement.

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					42.9%

Dunnett's Multiple Comparison Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
64B810E3		2F8DB23	3.956	2.506	8	0.8829	0.0012	Significant Effect
		35ED0318	-0.1828	2.506	8	0.8829	0.9340	Non-Significant Effect
		634EFACF	-1.547	2.506	8	0.8829	0.9991	Non-Significant Effect
		28602B1E	-6.988	2.506	8	0.8829	1.0000	Non-Significant Effect
		1CD8C95F	0.1715	2.506	8	0.8829	0.8577	Non-Significant Effect
		31E0E5B3	1.166	2.506	8	0.8829	0.4447	Non-Significant Effect
		64BB680B	1.492	2.506	8	0.8829	0.3009	Non-Significant Effect
		196479DF	3.89	2.506	8	0.8829	0.0014	Significant Effect
		141B370A	4.279	2.506	8	0.8829	0.0005	Significant Effect

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	07-9275-2912	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:02	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	62.09045	6.898939	9	22.24	<0.0001	Significant Effect
Error	12.40873	0.3102184	40			
Total	74.49918	7.209157	49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	19.59	21.67	0.0206	Equal Variances
Variances	Mod Levene Equality of Variance	1.847	3.067	0.1003	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9545	0.9367	0.0523	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1258	0.1453	0.0464	Normal Distribution
Distribution	D'Agostino Skewness	1.535	2.576	0.1247	Normal Distribution
Distribution	D'Agostino Kurtosis	2.253	2.576	0.0243	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	7.431	9.21	0.0243	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.7207	3.878	0.0599	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	2.058	1.899	2.218	1.454	2.564	0.1876	0.4195	20.38%	0.0%
2F8DB23	5	0.6648	0.5914	0.7382	0.484	0.962	0.08634	0.1931	29.04%	67.7%
35ED0318	5	2.123	1.956	2.29	1.552	2.656	0.1964	0.4391	20.68%	-3.13%
634EFACF	5	2.603	2.369	2.837	1.918	3.358	0.2752	0.6154	23.64%	-26.47%
28602B1E	5	4.52	4.228	4.812	3.43	5.484	0.3434	0.7679	16.99%	-119.6%
1CD8C95F	5	1.998	1.584	2.412	0.91	3.722	0.4873	1.09	54.54%	2.93%
31E0E5B3	5	1.648	1.445	1.85	1.016	2.478	0.2382	0.5327	32.33%	19.96%
64BB680B	5	1.533	1.385	1.681	0.954	1.96	0.1742	0.3896	25.42%	25.53%
196479DF	5	0.688	0.6058	0.7702	0.384	0.918	0.09667	0.2162	31.42%	66.58%
141B370A	5	0.5512	0.4594	0.643	0.18	0.828	0.1079	0.2413	43.77%	73.22%

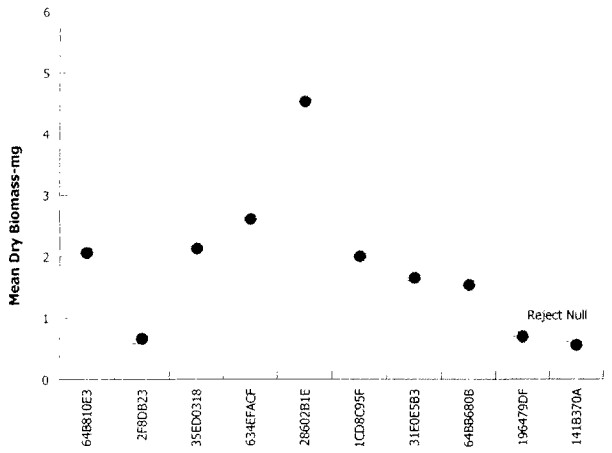
Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

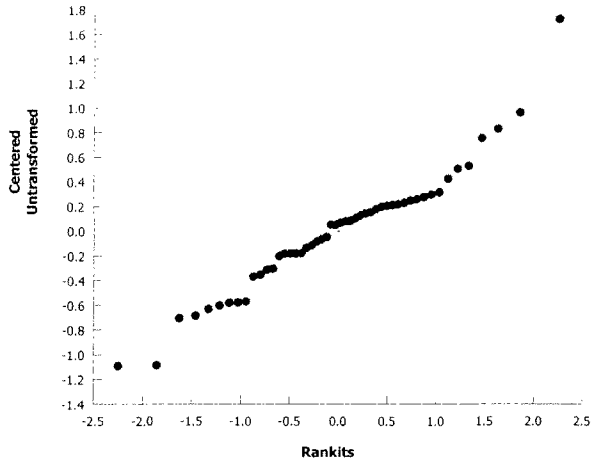
Analysis ID:	07-9275-2912	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 15:02	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
64B810E3	2.564	2.27	1.876	1.454	2.128
2F8DB23	0.962	0.58	0.548	0.484	0.75
35ED0318	2.656	1.81	2.268	2.328	1.552
634EFACF	1.918	2.022	3.358	2.918	2.8
28602B1E	3.43	4.78	4.166	5.484	4.74
1CD8C95F	3.722	2.248	1.292	0.91	1.818
31E0E5B3	1.016	1.7	1.6	1.444	2.478
64BB680B	1.712	1.688	1.96	1.35	0.954
196479DF	0.77	0.384	0.552	0.816	0.918
141B370A	0.828	0.658	0.486	0.18	0.604

Graphics





Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	20-8204-7622	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 13:29	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Batch ID:	13-0329-4912	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	10 Sep-10 13:00	**Protocol:**	ASTM E1611-00 (2000)	**Diluent:**	Laboratory Seawater
Ending Date:		**Species:**	Neanthes arenaceodentata	**Brine:**	HW-Marinemix
Duration:	N/A	**Source:**	Cal State Univ. Long Beach	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
64B810E3	16-8978-4547	08 Sep-10	09 Sep-10	61h	URS Corp	100016848
2F8DB23	00-4986-3459	13 Aug-10 12:32	13 Aug-10 16:02	28d 0h		
35ED0318	09-0472-5272	16 Aug-10 15:28	17 Aug-10 12:30	24d 22h		
634EFACF	16-6612-0399	16 Aug-10 16:00	17 Aug-10 12:30	24d 21h		
28602B1E	06-7739-1134	16 Aug-10 16:36	17 Aug-10 12:30	24d 20h		
1CD8C95F	04-8396-9375	16 Aug-10 16:18	17 Aug-10 12:30	24d 21h		
31E0E5B3	08-3682-2451	16 Aug-10 17:00	17 Aug-10 12:30	24d 20h		
64BB680B	16-9000-3467	17 Aug-10 09:00	17 Aug-10 12:30	24d 4h		
196479DF	04-2601-5199	17 Aug-10 09:31	17 Aug-10 12:30	24d 3h		
141B370A	03-3732-7882	17 Aug-10 10:02	17 Aug-10 12:30	24d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
64B810E3	Control Sediment	Gulfco Marine - BERA	York River, VA		
2F8DB23	Test Sediment	Gulfco Marine - BERA	NAS-01		
35ED0318	Test Sediment	Gulfco Marine - BERA	NAS-02		
634EFACF	Test Sediment	Gulfco Marine - BERA	NAS-03		
28602B1E	Test Sediment	Gulfco Marine - BERA	NAS-04		
1CD8C95F	Test Sediment	Gulfco Marine - BERA	NAS-05		
31E0E5B3	Test Sediment	Gulfco Marine - BERA	NAS-06		
64BB680B	Test Sediment	Gulfco Marine - BERA	NAS-07		
196479DF	Test Sediment	Gulfco Marine - BERA	NAS-08		
141B370A	Test Sediment	Gulfco Marine - BERA	NAS-09		

Batch Note: Test was 21d duration, per work-scope agreement.

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	20-8204-7622	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 13:29	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	D<>0	Not Run					46.3%

Student-Newman-Keuls Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
64B810E3		2F8DB23	3.886	4.04	8	1.119	0.0644	Non-Significant Effect
		35ED0318	1.259	2.859	8	0.7922	0.3787	Non-Significant Effect
		634EFACF	2.331	3.792	8	1.051	0.3641	Non-Significant Effect
		28602B1E	12.14	4.04	8	1.119	0.0001	Significant Effect
		1CD8C95F	2.29	3.443	8	0.954	0.2494	Non-Significant Effect
		31E0E5B3	0.5915	2.859	8	0.7922	0.6781	Non-Significant Effect
		64BB680B	1.371	3.443	8	0.954	0.6002	Non-Significant Effect
		196479DF	3.502	3.792	8	1.051	0.0794	Non-Significant Effect
		141B370A	3.887	4.232	8	1.173	0.0879	Non-Significant Effect
2F8DB23		35ED0318	5.145	4.232	8	1.173	0.0095	Significant Effect
		634EFACF	6.217	4.521	8	1.253	0.0020	Significant Effect
		28602B1E	16.03	4.635	8	1.284	0.0001	Significant Effect
		1CD8C95F	6.177	4.389	8	1.216	0.0017	Significant Effect
		31E0E5B3	3.295	3.792	8	1.051	0.1084	Non-Significant Effect
		64BB680B	2.515	3.443	8	0.954	0.1899	Non-Significant Effect
		196479DF	0.3844	2.859	8	0.7922	0.7873	Non-Significant Effect
		141B370A	0.0006016	2.859	8	0.7922	0.9997	Non-Significant Effect
35ED0318		634EFACF	1.072	3.443	8	0.954	0.7307	Non-Significant Effect
		28602B1E	10.88	3.792	8	1.051	0.0002	Significant Effect
		1CD8C95F	1.031	2.859	8	0.7922	0.4703	Non-Significant Effect
		31E0E5B3	1.851	3.443	8	0.954	0.3988	Non-Significant Effect
		64BB680B	2.63	3.792	8	1.051	0.2615	Non-Significant Effect
		196479DF	4.761	4.04	8	1.119	0.0139	Significant Effect
		141B370A	5.146	4.389	8	1.216	0.0127	Significant Effect
634EFACF		28602B1E	9.811	2.859	8	0.7922	0.0001	Significant Effect
		1CD8C95F	0.04066	2.859	8	0.7922	0.9773	Non-Significant Effect
		31E0E5B3	2.923	4.04	8	1.119	0.2545	Non-Significant Effect
		64BB680B	3.702	4.232	8	1.173	0.1165	Non-Significant Effect
		196479DF	5.833	4.389	8	1.216	0.0033	Significant Effect
		141B370A	6.218	4.635	8	1.284	0.0024	Significant Effect
28602B1E		1CD8C95F	9.851	3.443	8	0.954	0.0001	Significant Effect
		31E0E5B3	12.73	4.232	8	1.173	0.0001	Significant Effect
		64BB680B	13.51	4.389	8	1.216	0.0001	Significant Effect
		196479DF	15.64	4.521	8	1.253	0.0001	Significant Effect
		141B370A	16.03	4.735	8	1.312	0.0002	Significant Effect
1CD8C95F		31E0E5B3	2.882	3.792	8	1.051	0.1916	Non-Significant Effect
		64BB680B	3.662	4.04	8	1.119	0.0918	Non-Significant Effect
		196479DF	5.792	4.232	8	1.173	0.0027	Significant Effect
		141B370A	6.177	4.521	8	1.253	0.0021	Significant Effect
31E0E5B3		64BB680B	0.7796	2.859	8	0.7922	0.5847	Non-Significant Effect
		196479DF	2.91	3.443	8	0.954	0.1119	Non-Significant Effect
		141B370A	3.295	4.04	8	1.119	0.1568	Non-Significant Effect
64BB680B		196479DF	2.131	2.859	8	0.7922	0.1399	Non-Significant Effect
		141B370A	2.516	3.792	8	1.051	0.2984	Non-Significant Effect
196479DF		141B370A	0.385	3.443	8	0.954	0.9601	Non-Significant Effect

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	20-8204-7622	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 13:29	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend	15	-6		0.2269	Non-significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	77.57763	8.619737	9	22.46	<0.0001	Significant Effect
Error	15.35432	0.3838581	40			
Total	92.93195	9.003594	49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	13.57	21.67	0.1385	Equal Variances
Variances	Mod Levene Equality of Variance	1.183	3.067	0.3408	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9511	0.9367	0.0377	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1105	0.1453	0.1264	Normal Distribution
Distribution	D'Agostino Skewness	2.68	2.576	0.0074	Non-normal Distribution
Distribution	D'Agostino Kurtosis	2.312	2.576	0.0208	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	12.52	9.21	0.0019	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	0.6844	3.878	0.0739	Normal Distribution

Mean Dry Weight-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	2.058	1.899	2.218	1.454	2.564	0.1876	0.4195	20.38%	0.0%
2F8DB23	5	0.9817	0.8018	1.162	0.58	1.603	0.2114	0.4728	48.16%	52.31%
35ED0318	5	2.407	2.263	2.551	1.94	2.91	0.1693	0.3786	15.73%	-16.95%
634EFACF	5	2.704	2.502	2.907	1.918	3.358	0.2379	0.5319	19.67%	-31.38%
28602B1E	5	5.423	5.252	5.593	4.78	5.925	0.2002	0.4477	8.26%	-163.4%
1CD8C95F	5	2.693	2.209	3.177	1.517	4.653	0.569	1.272	47.25%	-30.83%
31E0E5B3	5	1.894	1.628	2.161	1.27	3.097	0.3138	0.7017	37.04%	7.96%
64BB680B	5	1.679	1.494	1.863	1.193	2.45	0.2169	0.4849	28.89%	18.46%
196479DF	5	1.088	0.9857	1.191	0.69	1.36	0.1205	0.2695	24.76%	47.14%
141B370A	5	0.9815	0.7429	1.22	0.45	2.07	0.2805	0.6272	63.9%	52.32%

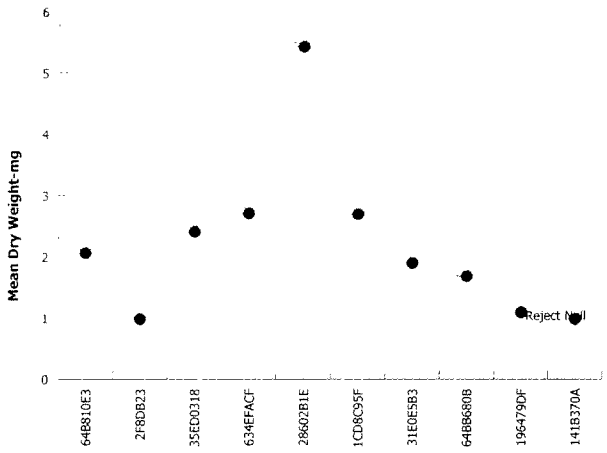
Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

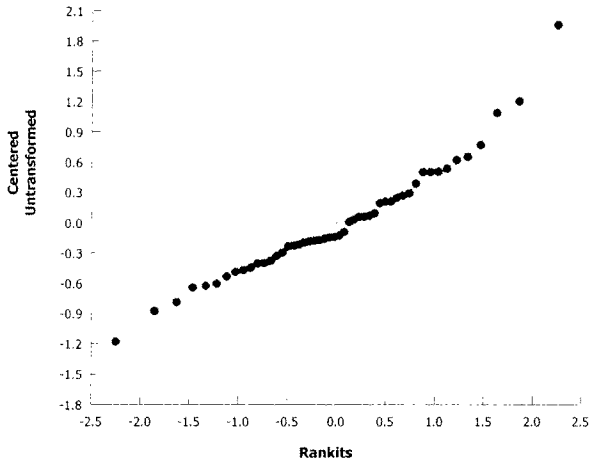
Analysis ID:	20-8204-7622	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	04 Oct-10 13:29	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
64B810E3	2.564	2.27	1.876	1.454	2.128
2F8DB23	1.603	0.58	1.37	0.605	0.75
35ED0318	2.656	2.262	2.268	2.91	1.94
634EFACF	1.918	2.528	3.358	2.918	2.8
28602B1E	5.717	4.78	5.208	5.484	5.925
1CD8C95F	4.653	2.248	3.23	1.517	1.818
31E0E5B3	1.27	1.7	1.6	1.805	3.097
64BB680B	1.712	1.688	2.45	1.35	1.193
196479DF	1.283	0.96	0.69	1.36	1.147
141B370A	2.07	0.8225	0.81	0.45	0.755

Graphics





Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	14-9818-7789	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	03 Oct-10 13:46	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Batch ID:	13-0329-4912	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	10 Sep-10 13:00	**Protocol:**	ASTM E1611-00 (2000)	**Diluent:**	Laboratory Seawater
Ending Date:		**Species:**	Neanthes arenaceodentata	**Brine:**	HW-Marinemix
Duration:	N/A	**Source:**	Cal State Univ. Long Beach	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
64B810E3	16-8978-4547	08 Sep-10	09 Sep-10	61h	URS Corp	100016848
2F8DB23	00-4986-3459	13 Aug-10 12:32	13 Aug-10 16:02	28d 0h		
35ED0318	09-0472-5272	16 Aug-10 15:28	17 Aug-10 12:30	24d 22h		
634EFACF	16-6612-0399	16 Aug-10 16:00	17 Aug-10 12:30	24d 21h		
28602B1E	06-7739-1134	16 Aug-10 16:36	17 Aug-10 12:30	24d 20h		
1CD8C95F	04-8396-9375	16 Aug-10 16:18	17 Aug-10 12:30	24d 21h		
31E0E5B3	08-3682-2451	16 Aug-10 17:00	17 Aug-10 12:30	24d 20h		
64BB680B	16-9000-3467	17 Aug-10 09:00	17 Aug-10 12:30	24d 4h		
196479DF	04-2601-5199	17 Aug-10 09:31	17 Aug-10 12:30	24d 3h		
141B370A	03-3732-7882	17 Aug-10 10:02	17 Aug-10 12:30	24d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
64B810E3	Control Sediment	Gulfco Marine - BERA	York River, VA		
2F8DB23	Test Sediment	Gulfco Marine - BERA	NAS-01		
35ED0318	Test Sediment	Gulfco Marine - BERA	NAS-02		
634EFACF	Test Sediment	Gulfco Marine - BERA	NAS-03		
28602B1E	Test Sediment	Gulfco Marine - BERA	NAS-04		
1CD8C95F	Test Sediment	Gulfco Marine - BERA	NAS-05		
31E0E5B3	Test Sediment	Gulfco Marine - BERA	NAS-06		
64BB680B	Test Sediment	Gulfco Marine - BERA	NAS-07		
196479DF	Test Sediment	Gulfco Marine - BERA	NAS-08		
141B370A	Test Sediment	Gulfco Marine - BERA	NAS-09		

Batch Note: Test was 21d duration, per work-scope agreement.

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	14-9818-7789	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	03 Oct-10 13:46	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	D<>0	Not Run					41.7%

Student-Newman-Keuls Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
64B810E3		2F8DB23	5.595	4.232	8	1.054	0.0039	Significant Effect
		35ED0318	0.2585	2.859	8	0.7122	0.8560	Non-Significant Effect
		634EFACF	2.187	3.443	8	0.8577	0.2806	Non-Significant Effect
		28602B1E	9.883	3.792	8	0.9445	0.0002	Significant Effect
		1CD8C95F	0.2425	2.859	8	0.7122	0.8648	Non-Significant Effect
		31E0E5B3	1.649	3.443	8	0.8577	0.4800	Non-Significant Effect
		64BB680B	2.11	3.792	8	0.9445	0.4517	Non-Significant Effect
		196479DF	5.502	4.04	8	1.006	0.0033	Significant Effect
		141B370A	6.051	4.389	8	1.093	0.0021	Significant Effect
2F8DB23		35ED0318	5.853	4.389	8	1.093	0.0032	Significant Effect
		634EFACF	7.782	4.521	8	1.126	0.0002	Significant Effect
		28602B1E	15.48	4.635	8	1.155	0.0001	Significant Effect
		1CD8C95F	5.352	4.04	8	1.006	0.0045	Significant Effect
		31E0E5B3	3.946	3.792	8	0.9445	0.0387	Significant Effect
		64BB680B	3.485	3.443	8	0.8577	0.0468	Significant Effect
		196479DF	0.09314	2.859	8	0.7122	0.9479	Non-Significant Effect
		141B370A	0.4561	2.859	8	0.7122	0.7489	Non-Significant Effect
35ED0318		634EFACF	1.929	2.859	8	0.7122	0.1804	Non-Significant Effect
		28602B1E	9.624	3.443	8	0.8577	0.0001	Significant Effect
		1CD8C95F	0.501	3.443	8	0.8577	0.9334	Non-Significant Effect
		31E0E5B3	1.908	3.792	8	0.9445	0.5381	Non-Significant Effect
		64BB680B	2.369	4.04	8	1.006	0.4605	Non-Significant Effect
		196479DF	5.76	4.232	8	1.054	0.0028	Significant Effect
		141B370A	6.309	4.521	8	1.126	0.0016	Significant Effect
634EFACF		28602B1E	7.695	2.859	8	0.7122	0.0001	Significant Effect
		1CD8C95F	2.43	3.792	8	0.9445	0.3281	Non-Significant Effect
		31E0E5B3	3.836	4.04	8	1.006	0.0698	Non-Significant Effect
		64BB680B	4.297	4.232	8	1.054	0.0448	Significant Effect
		196479DF	7.689	4.389	8	1.093	0.0002	Significant Effect
		141B370A	8.238	4.635	8	1.155	0.0002	Significant Effect
28602B1E		1CD8C95F	10.13	4.04	8	1.006	0.0001	Significant Effect
		31E0E5B3	11.53	4.232	8	1.054	0.0001	Significant Effect
		64BB680B	11.99	4.389	8	1.093	0.0001	Significant Effect
		196479DF	15.38	4.521	8	1.126	0.0001	Significant Effect
		141B370A	15.93	4.735	8	1.179	0.0002	Significant Effect
1CD8C95F		31E0E5B3	1.407	2.859	8	0.7122	0.3260	Non-Significant Effect
		64BB680B	1.868	3.443	8	0.8577	0.3924	Non-Significant Effect
		196479DF	5.259	3.792	8	0.9445	0.0034	Significant Effect
		141B370A	5.808	4.232	8	1.054	0.0026	Significant Effect
31E0E5B3		64BB680B	0.4609	2.859	8	0.7122	0.7463	Non-Significant Effect
		196479DF	3.852	3.443	8	0.8577	0.0254	Significant Effect
		141B370A	4.402	4.04	8	1.006	0.0268	Significant Effect
64BB680B		196479DF	3.392	2.859	8	0.7122	0.0213	Significant Effect
		141B370A	3.941	3.792	8	0.9445	0.0390	Significant Effect
196479DF		141B370A	0.5492	3.443	8	0.8577	0.9205	Non-Significant Effect

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	14-9818-7789	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	03 Oct-10 13:46	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	62.09045	6.898939	9	22.24	<0.0001	Significant Effect
Error	12.40873	0.3102184	40			
Total	74.49918	7.209157	49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	19.59	21.67	0.0206	Equal Variances
Variances	Mod Levene Equality of Variance	1.847	3.067	0.1003	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9545	0.9367	0.0523	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1258	0.1453	0.0464	Normal Distribution
Distribution	D'Agostino Skewness	1.535	2.576	0.1247	Normal Distribution
Distribution	D'Agostino Kurtosis	2.253	2.576	0.0243	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	7.431	9.21	0.0243	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.7207	3.878	0.0599	Normal Distribution

Mean Dry Biomass-mg Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	2.058	1.899	2.218	1.454	2.564	0.1876	0.4195	20.38%	0.0%
2F8DB23	5	0.6648	0.5914	0.7382	0.484	0.962	0.08634	0.1931	29.04%	67.7%
35ED0318	5	2.123	1.956	2.29	1.552	2.656	0.1964	0.4391	20.68%	-3.13%
634EFACF	5	2.603	2.369	2.837	1.918	3.358	0.2752	0.6154	23.64%	-26.47%
28602B1E	5	4.52	4.228	4.812	3.43	5.484	0.3434	0.7679	16.99%	-119.6%
1CD8C95F	5	1.998	1.584	2.412	0.91	3.722	0.4873	1.09	54.54%	2.93%
31E0E5B3	5	1.648	1.445	1.85	1.016	2.478	0.2382	0.5327	32.33%	19.96%
64BB680B	5	1.533	1.385	1.681	0.954	1.96	0.1742	0.3896	25.42%	25.53%
196479DF	5	0.688	0.6058	0.7702	0.384	0.918	0.09667	0.2162	31.42%	66.58%
141B370A	5	0.5512	0.4594	0.643	0.18	0.828	0.1079	0.2413	43.77%	73.22%

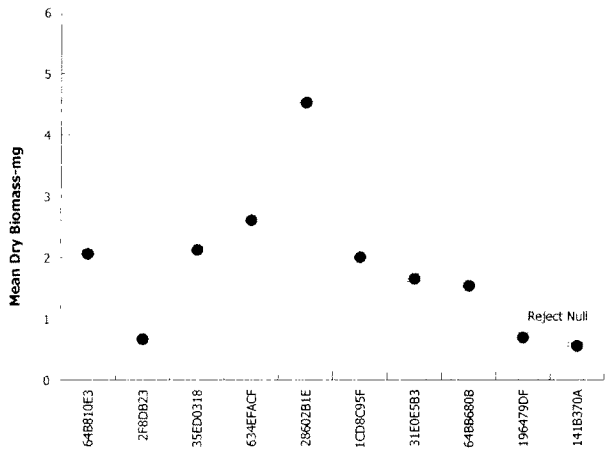
Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

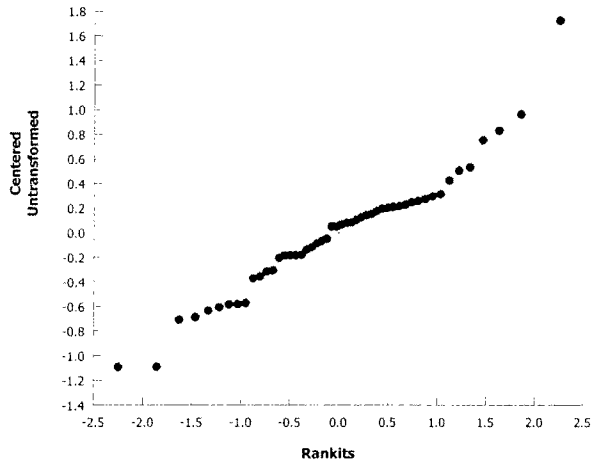
Analysis ID:	14-9818-7789	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.0
Analyzed:	03 Oct-10 13:46	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Mean Dry Biomass-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
64B810E3	2.564	2.27	1.876	1.454	2.128
2F8DB23	0.962	0.58	0.548	0.484	0.75
35ED0318	2.656	1.81	2.268	2.328	1.552
634EFACF	1.918	2.022	3.358	2.918	2.8
28602B1E	3.43	4.78	4.166	5.484	4.74
1CD8C95F	3.722	2.248	1.292	0.91	1.818
31E0E5B3	1.016	1.7	1.6	1.444	2.478
64BB680B	1.712	1.688	1.96	1.35	0.954
196479DF	0.77	0.384	0.552	0.816	0.918
141B370A	0.828	0.658	0.486	0.18	0.604

Graphics





Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	18-1476-5183	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	01 Oct-10 17:50	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Batch ID:	13-0329-4912	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	10 Sep-10 13:00	**Protocol:**	ASTM E1611-00 (2000)	**Diluent:**	Laboratory Seawater
Ending Date:		**Species:**	Neanthes arenaceodentata	**Brine:**	HW-Marinemix
Duration:	N/A	**Source:**	Cal State Univ. Long Beach	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
64B810E3	16-8978-4547	08 Sep-10	09 Sep-10	61h	URS Corp	100016848
2F8DB23	00-4986-3459	13 Aug-10 12:32	13 Aug-10 16:02	28d 0h		
35ED0318	09-0472-5272	16 Aug-10 15:28	17 Aug-10 12:30	24d 22h		
634EFACF	16-6612-0399	16 Aug-10 16:00	17 Aug-10 12:30	24d 21h		
28602B1E	06-7739-1134	16 Aug-10 16:36	17 Aug-10 12:30	24d 20h		
1CD8C95F	04-8396-9375	16 Aug-10 16:18	17 Aug-10 12:30	24d 21h		
31E0E5B3	08-3682-2451	16 Aug-10 17:00	17 Aug-10 12:30	24d 20h		
64BB680B	16-9000-3467	17 Aug-10 09:00	17 Aug-10 12:30	24d 4h		
196479DF	04-2601-5199	17 Aug-10 09:31	17 Aug-10 12:30	24d 3h		
141B370A	03-3732-7882	17 Aug-10 10:02	17 Aug-10 12:30	24d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
64B810E3	Control Sediment	Gulfco Marine - BERA	York River, VA		
2F8DB23	Test Sediment	Gulfco Marine - BERA	NAS-01		
35ED0318	Test Sediment	Gulfco Marine - BERA	NAS-02		
634EFACF	Test Sediment	Gulfco Marine - BERA	NAS-03		
28602B1E	Test Sediment	Gulfco Marine - BERA	NAS-04		
1CD8C95F	Test Sediment	Gulfco Marine - BERA	NAS-05		
31E0E5B3	Test Sediment	Gulfco Marine - BERA	NAS-06		
64BB680B	Test Sediment	Gulfco Marine - BERA	NAS-07		
196479DF	Test Sediment	Gulfco Marine - BERA	NAS-08		
141B370A	Test Sediment	Gulfco Marine - BERA	NAS-09		

Batch Note: Test was 21d duration, per work-scope agreement.

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID: 18-1476-5183 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.8.0
Analyzed: 01 Oct-10 17:50 **Analysis:** Parametric-All Pairwise **Official Results:** Yes

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	D<>0	Not Run					19.9%

Student-Newman-Keuls Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
64B810E3		2F8DB23	3.276	4.389	8	0.3638	0.2616	Non-Significant Effect
		35ED0318	1.724	3.792	8	0.3143	0.6188	Non-Significant Effect
		634EFACF	0.5746	2.859	8	0.237	0.6868	Non-Significant Effect
		28602B1E	2.257	4.232	8	0.3508	0.6060	Non-Significant Effect
		1CD8C95F	3.276	4.389	8	0.3638	0.2616	Non-Significant Effect
		31E0E5B3	1.724	3.792	8	0.3143	0.6188	Non-Significant Effect
		64BB680B	1.149	3.443	8	0.2854	0.6976	Non-Significant Effect
		196479DF	4.959	4.635	8	0.3842	0.0282	Significant Effect
		141B370A	5.445	4.735	8	0.3925	0.0136	Significant Effect
2F8DB23		35ED0318	1.553	3.792	8	0.3143	0.6930	Non-Significant Effect
		634EFACF	2.702	4.232	8	0.3508	0.4111	Non-Significant Effect
		28602B1E	1.019	2.859	8	0.237	0.4754	Non-Significant Effect
		1CD8C95F	0		8		>0.05	Non-Significant Effect
		31E0E5B3	1.553	3.792	8	0.3143	0.6930	Non-Significant Effect
		64BB680B	2.127	4.04	8	0.3349	0.5660	Non-Significant Effect
		196479DF	1.682	2.859	8	0.237	0.2413	Non-Significant Effect
		141B370A	2.168	3.443	8	0.2854	0.2866	Non-Significant Effect
35ED0318		634EFACF	1.149	3.443	8	0.2854	0.6976	Non-Significant Effect
		28602B1E	0.5334	2.859	8	0.237	0.7082	Non-Significant Effect
		1CD8C95F	1.553	3.792	8	0.3143	0.6930	Non-Significant Effect
		31E0E5B3	0		8		>0.05	Non-Significant Effect
		64BB680B	0.5746	2.859	8	0.237	0.6868	Non-Significant Effect
		196479DF	3.235	4.04	8	0.3349	0.1703	Non-Significant Effect
		141B370A	3.721	4.232	8	0.3508	0.1133	Non-Significant Effect
634EFACF		28602B1E	1.682	4.04	8	0.3349	0.7572	Non-Significant Effect
		1CD8C95F	2.702	4.232	8	0.3508	0.4111	Non-Significant Effect
		31E0E5B3	1.149	3.443	8	0.2854	0.6976	Non-Significant Effect
		64BB680B	0.5746	2.859	8	0.237	0.6868	Non-Significant Effect
		196479DF	4.384	4.521	8	0.3748	0.0631	Non-Significant Effect
		141B370A	4.87	4.635	8	0.3842	0.0331	Significant Effect
28602B1E		1CD8C95F	1.019	2.859	8	0.237	0.4754	Non-Significant Effect
		31E0E5B3	0.5334	2.859	8	0.237	0.7082	Non-Significant Effect
		64BB680B	1.108	3.792	8	0.3143	0.8616	Non-Significant Effect
		196479DF	2.702	3.792	8	0.3143	0.2401	Non-Significant Effect
		141B370A	3.188	4.04	8	0.3349	0.1815	Non-Significant Effect
1CD8C95F		31E0E5B3	1.553	3.792	8	0.3143	0.6930	Non-Significant Effect
		64BB680B	2.127	4.04	8	0.3349	0.5660	Non-Significant Effect
		196479DF	1.682	2.859	8	0.237	0.2413	Non-Significant Effect
		141B370A	2.168	3.443	8	0.2854	0.2866	Non-Significant Effect
31E0E5B3		64BB680B	0.5746	2.859	8	0.237	0.6868	Non-Significant Effect
		196479DF	3.235	4.04	8	0.3349	0.1703	Non-Significant Effect
		141B370A	3.721	4.232	8	0.3508	0.1133	Non-Significant Effect
64BB680B		196479DF	3.81	4.389	8	0.3638	0.1264	Non-Significant Effect
		141B370A	4.295	4.521	8	0.3748	0.0730	Non-Significant Effect
196479DF		141B370A	0.4858	2.859	8	0.237	0.7331	Non-Significant Effect

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	18-1476-5183	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	01 Oct-10 17:50	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.9939352	0.1104372	9	3.214	0.0051	Significant Effect
Error	1.374281	0.03435702	40			
Total	2.368216	0.1447943	49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2.788	3.067	0.0167	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9719	0.9367	0.2760	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.08322	0.1453	0.4953	Normal Distribution
Distribution	D'Agostino Skewness	0.9149	2.576	0.3602	Normal Distribution
Distribution	D'Agostino Kurtosis	0.4794	2.576	0.6316	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	1.067	9.21	0.5866	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.3312	3.878	0.5245	Normal Distribution

Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	1	1	1	1	1	0	0	0.0%	0.0%
2F8DB23	5	0.76	0.6608	0.8592	0.4	1	0.1166	0.2608	34.31%	24.0%
35ED0318	5	0.88	0.8383	0.9217	0.8	1	0.04899	0.1095	12.45%	12.0%
634EFACF	5	0.96	0.926	0.994	0.8	1	0.04	0.08944	9.32%	4.0%
28602B1E	5	0.84	0.7764	0.9036	0.6	1	0.07483	0.1673	19.92%	16.0%
1CD8C95F	5	0.76	0.6608	0.8592	0.4	1	0.1166	0.2608	34.31%	24.0%
31E0E5B3	5	0.88	0.8383	0.9217	0.8	1	0.04899	0.1095	12.45%	12.0%
64BB680B	5	0.92	0.8783	0.9617	0.8	1	0.04899	0.1095	11.91%	8.0%
196479DF	5	0.64	0.5764	0.7036	0.4	0.8	0.07483	0.1673	26.15%	36.0%
141B370A	5	0.6	0.5239	0.6761	0.4	0.8	0.08944	0.2	33.33%	40.0%

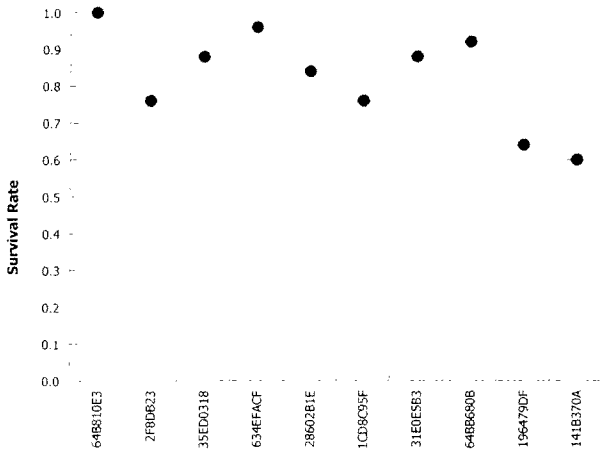
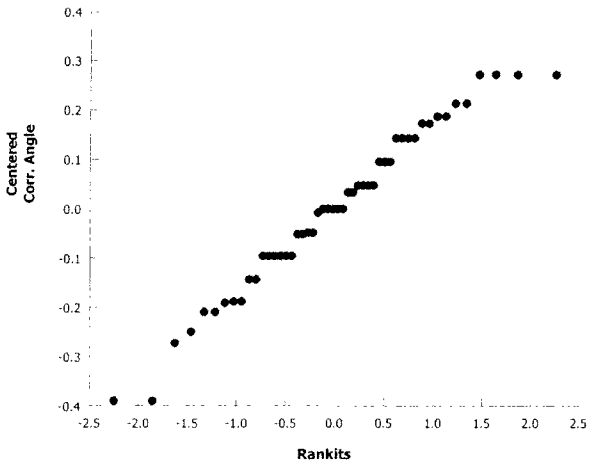
Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
64B810E3	5	1.345	1.345	1.345	1.345	1.345	0	0	0.0%	0.0%
2F8DB23	5	1.074	0.9636	1.184	0.6847	1.345	0.1294	0.2895	26.96%	20.19%
35ED0318	5	1.202	1.153	1.252	1.107	1.345	0.05833	0.1304	10.85%	10.62%
634EFACF	5	1.298	1.257	1.338	1.107	1.345	0.04763	0.1065	8.21%	3.54%
28602B1E	5	1.158	1.085	1.232	0.8861	1.345	0.08639	0.1932	16.68%	13.91%
1CD8C95F	5	1.074	0.9636	1.184	0.6847	1.345	0.1294	0.2895	26.96%	20.19%
31E0E5B3	5	1.202	1.153	1.252	1.107	1.345	0.05833	0.1304	10.85%	10.62%
64BB680B	5	1.25	1.2	1.3	1.107	1.345	0.05833	0.1304	10.43%	7.08%
196479DF	5	0.9342	0.8665	1.002	0.6847	1.107	0.07959	0.178	19.05%	30.55%
141B370A	5	0.894	0.8136	0.9743	0.6847	1.107	0.09448	0.2113	23.63%	33.55%

Neanthes 20-d Survival and Growth Sediment Test — **PBS&J Environmental Toxicology Laboratory**

Analysis ID:	18-1476-5183	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	01 Oct-10 17:50	**Analysis:**	Parametric-All Pairwise	**Official Results:**	Yes

Survival Rate Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
64B810E3	1	1	1	1	1
2F8DB23	0.6	1	0.4	0.8	1
35ED0318	1	0.8	1	0.8	0.8
634EFACF	1	0.8	1	1	1
28602B1E	0.6	1	0.8	1	0.8
1CD8C95F	0.8	1	0.4	0.6	1
31E0E5B3	0.8	1	1	0.8	0.8
64BB680B	1	1	0.8	1	0.8
196479DF	0.6	0.4	0.8	0.6	0.8
141B370A	0.4	0.8	0.6	0.4	0.8

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