

## **Technical Appendix F**

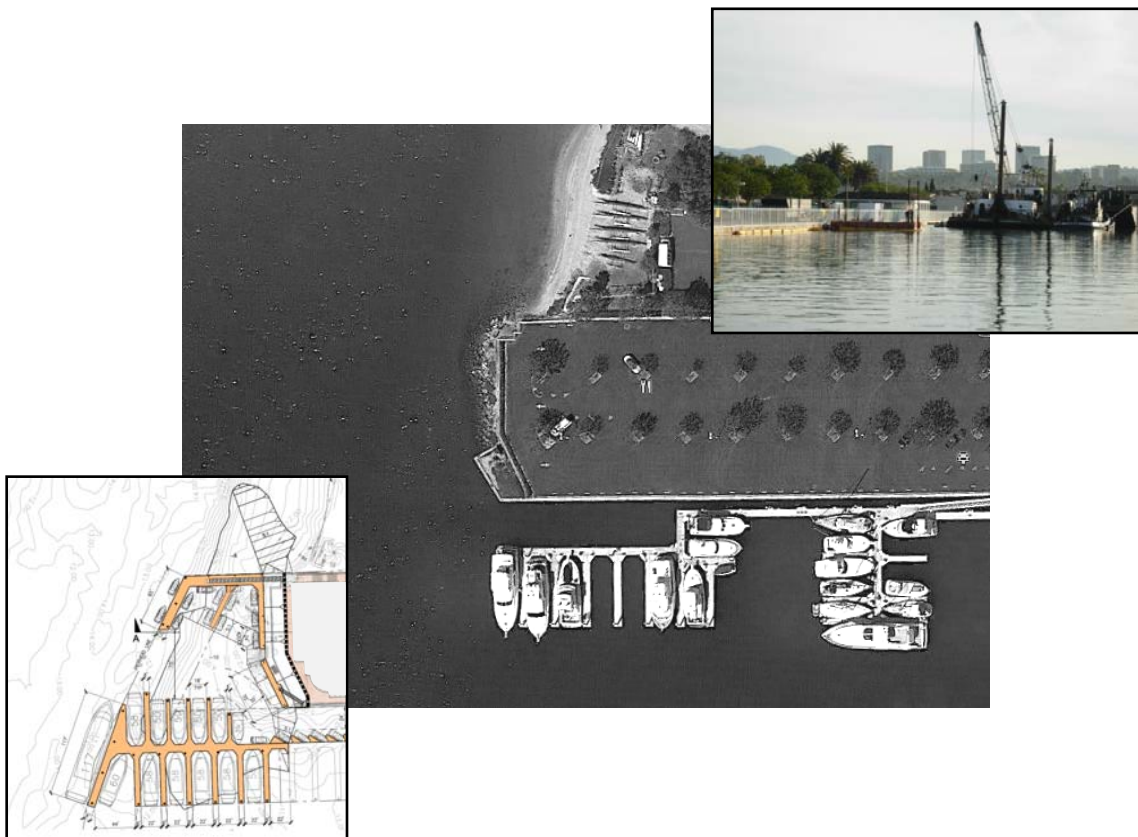
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**Balboa Marina West Expansion Project Dredged Material Evaluation Sampling and  
Analysis Report  
NewFields, LLC  
February 7, 2014**

**Balboa Marina West Expansion Project  
Dredged Material Evaluation**

**Sampling and Analysis Report**

**Final  
February 7, 2014**



 **NewFields**

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## Executive Summary

The City of Newport Beach and the Irvine Company are proposing to modify the western portion of the existing Balboa Marina to allow for public pedestrian access, public boat slips, as well as increasing the number of private slips at the marina. The proposed design would require dredging of approximately 9,900 cubic yards of sediment, as well as the removal of 1,300 cubic yards of upland soils (material from above the MHHW mark [+5.43' MLLW]). Upland soils will be disposed of as construction fill and were not included in this evaluation.

The area was evaluated as two composites, with Area A representing the nearshore area below +1 ft. MLLW and a small portion of the intertidal north of the existing parking lot. The Area B composite represented the current upland parking lot, as well as a small portion of intertidal sediment at the base of the current rip-rap. Sediment in cores collected from the Area A stations, as well as Stations B-1 and B-3 were comprised of wet, grey silty-sand overlying coarsesand with shellhash. Sediment and soils underlying the parking lot were dry brown and grayish brown sands, with some evidence of shell hash in wet coarse sand in the deeper portions of cores. The coarse sands in the upper elevations of the Station B-2 cores had a petroleum odor and some black colorations between +3 to +4 MLLW. No evidence of petroleum was found in the deeper portions of the Station B-2 cores or in any of the other stations sampled. Sediments from both areas were generally dominated by sand, with 79% and 94% sand and gravel in the Area A and B composites respectively.

Chemical analysis was conducted on the Area A and B composites, the LA-3 Reference sediment, and subsamples from Stations B-1 and B-3. Chemical concentrations in all samples were generally similar to or below those of the LA-3 Reference or the effects-range low (ERM); concentrations for each of the target analytes were below their respective effects-range median (ERM). Mercury concentrations were 0.17 mg/kg and <0.03 mg/kg (undetected) in the Area A and B composites, respectively; the ERL for mercury is 0.15 mg/kg. Organotins, pyrethroids, and chlorinated pesticides (except DDx) were undetected. Total DDx concentrations in the Area A and B composites were 20 and 6.5 µg/kg, whereas the total DDx in the LA-3 Reference was 18 µg/kg. The ERM for total DDx is 46.1 µg/kg.

No acute or sublethal biologically significant toxicity was observed in the water-column tests. For the Area A composite, no statistically significant mortality was observed in the amphipod and polychaete worm tests. No toxicity was observed in the polychaete test with the Area B composite, however, 100% mortality was observed in the amphipod test with *Ampelisca abdita*. This observation was confirmed with subsequent tests with the amphipod *Eohaustorius estuarius*, indicating that it was not an effect associated with the coarse grain size of the Area B composite. The Area B composite had a petroleum-like odor which may have been associated with the field observations associated with the B-2 sample.

The water column tests with fish, mysids, and larval bivalves had LC<sub>50</sub>/EC<sub>50</sub> concentrations of >100%, indicating that the dredged material is not predicted to be acutely toxic to water column organisms. Survival and normal development in each of the 100% SPP treatments were

not significantly different than those of the control, meeting the LPC requirements in the Ocean and Inland Testing Manual (OTM/ITM).

There was no statistically significant uptake of mercury in worm tissues relative to the reference or background tissues. While there was statistically significant uptake of mercury in clam tissues, concentrations were  $\leq 1.3$  times those of the reference tissues and all values were well within FDA guidance values and below critical body residue concentrations (ERED and TTL) that have been developed as protective levels for adverse effects for the test organisms or for protection of food web amplification

Using the OTM/ITM suitability criteria, sediments from the stations included in the Area A composite would be considered to be suitable for ocean disposal. The soils and sediment found beneath the parking lot area did not meet the suitability criteria due to acute toxicity in the amphipod test. The intertidal sediment represented by Station B-3 was very similar to the marine sediments found in the nearby Area A stations and were dissimilar to the soils and buried sediments found in beneath the parking lot area. The COPC concentrations in the Station B-3 sediment were below the ERL values and those found in the LA-3 Reference sediment. Based on discussions with the DMMT, those marine sediments beyond the current rip-rap line and cement revetment would be considered suitable for ocean disposal (Figure 7). This represents an estimated 4,000 CY, with an estimated 1,230 CY per foot of overdredge.

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## 1. INTRODUCTION

The City of Newport Beach (the City) and the Irvine Company are proposing to modify the western portion of the existing Balboa Marina to allow for public pedestrian access, public boat slips, as well as increasing the number of private slips at the marina (Figure 1 and 2). The proposed design would require dredging of approximately 9,900 cubic yards of sediment (Table 1), as well as the removal of 1,300 cubic yards of upland soils (material from above the MHHW mark [+5.43' MLLW]). Upland soils will be disposed of as construction fill. The primary disposal options under consideration for material below the mean high water mark are 1) nearshore replenishment under the unconfined aquatic disposal alternative as governed by the U.S. Army Corps of Engineers (USACE)/U.S. Environmental Protection Agency (USEPA) guidelines set forth in the Inland Testing Manual (ITM; USACE/USEPA 1998), and 2) ocean disposal at disposal site LA-3 based on guidance provided by the Ocean Testing Manual (OTM; USACE/USEPA 1991). The objective of this sampling and analysis program (SAP) is to characterize the dredged materials to determine environmental suitability for beach replenishment or ocean disposal.

### Background and Review of Previous Characterizations

Newport Bay is a coastal embayment located within the City of Newport Beach, California. The Newport Bay area supports a variety of land uses including navigation, marine industry, private and public marinas, recreational activities, and residential uses. Upper and lower Newport Bay are estuarine and nearshore marine environments, supporting both residential and migratory fish and bird species as well as a variety of native plant species. In addition, San Diego Creek flows into upper reaches of Newport Bay, providing aquatic and terrestrial habitat.

The Balboa Marina is located in Lower Newport Bay, immediately south of the Pacific Coast Highway and north of the channel that separates Linda Isle from the Pacific Coast Highway (Figure 1). The marina was originally constructed in 1964 and was renovated in 2008. As part of the renovation, approximately 36,000 CY of accumulated sediments were evaluated for dredged material placement. The dredged material qualified for ocean placement under the Ocean Testing Manual and was placed at the LA-3 Ocean Dredged Material Disposal Site (ODMDS) in 2008. As part of the 2008 marina renovation, the *Reuben E. Lee* riverboat restaurant at the western end of the marina was removed. The current project would occupy the area previously occupied by the *Reuben E. Lee* and would provide a new point of public access to the harbor, a public dock with 12 public boat slips and add up to 24 private slips to the existing Balboa Marina.

Table 1. Project volumes (cubic yards; CY) of proposed dredged material for Balboa Marina West sediment evaluation. (Note: 1,300 CY of upland fill material not included in this table).

Project Area	Project Depth (ft. MLLW)	Estimated Volume to Project Depth	Paid Overdredge Volume (1 ft. OD)	Unpaid Overdredge Volume (1 ft. OD)
Balboa Marina West Area A	-6 to -10	3,000 CY	1,125 CY	1,125 CY
Balboa Marina West Area B	0 to -6	4,100 CY	275 CY	275 CY



Figure 1. Lower Newport Bay and the Balboa Marina West Project Area



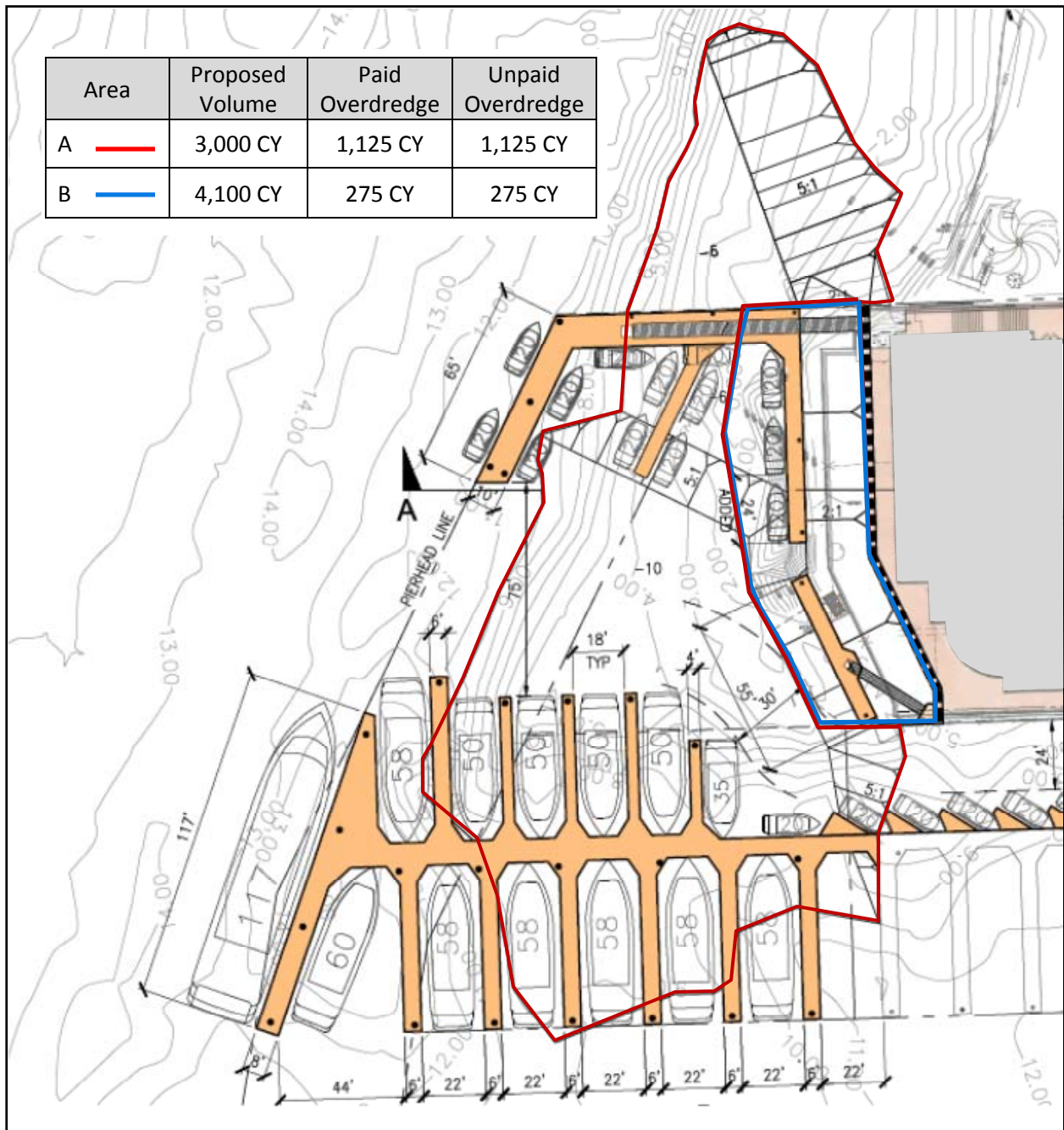


Figure 2. Project plan, proposed dredging footprint and current bathymetry of site.

## Review of Previous Sediment Characterizations

Sediment from the vicinity of Balboa Marina has recently been evaluated during three previous investigations: by the Southern California Coastal Water Research Project as part of the Southern California Bight Program in 2003 (Bight '03), by NewFields (formerly Weston Solutions, Inc.) as part of the renewal of the Regional General Permit 54 (RGP-54) for Newport Bay in 2005, and by NewFields in support of the Balboa Marina Renovation in 2007.

Bight '03 and RGP-54: Samples collected were analyzed for physical and chemical parameters, as well as potential biological effects. Sample 4097 collected for the Bight '03 program was a surface grab, collecting only the upper 2 cm of sediment. Samples collected for the RGP-54 sediment evaluation were cores collected to -11 ft. MLLW. The core collected from Station 2-1 was 2 ft. in length. The Bight '03 sediment was dominated by clay and silt, with greater than >90% silt/clay. Sediment collected from the Station 2-1 core was 46% silt/clay. The reported TOC content was also quite different, with 2.5% in the Bight '03 sample and 0.87% in Station 2-1 sample. The Bight '03 sediment collected in the surface grab was consistent with the surface material that was observed in the cores collected during the RGP-54 survey.

Chemical analysis of sediment from the Bight '03 and RGP-54 surveys included metals, polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), chlorinated pesticides, and organotins. PAHs, PCBs, and organotins were either undetected or detected at very low concentrations. Total PAHs were 182 µg/kg and 68.4 µg/kg for Stations 4097 and 2-1, respectively and were well below the ER-L values. Chemical concentrations for metals and chlorinated pesticides are shown in Table 2. Metals concentrations were below ER-M concentrations; mercury was 0.09 mg/kg and 0.31 mg/kg for samples 4097 and 2-1, respectively. All three butyltins were undetected in the sediments samples. Except for DDTs and chlordane, chlorinated pesticides were also generally low or undetected in sediments. DDTs ranged from 1.12 µg/kg 2'4'-DDT to 70 µg/kg 4'4'-DDE in the Bight '03 sediments. The latter exceeded the ER-M for 4'4'-DDE (27 µg/kg). Aroclors were not detected in the sediments; however 22 of the 40 PCB congeners analyzed were detected. The detected concentrations of PCBs were all low, resulting in <½ of the total PCB ER-L (ΣPCB detected values). Tissues from the RGP-54 Area 2 composite bioaccumulation tests were analyzed for mercury, organotins, and chlorinated pesticides. With the exception of 4,4'-DDE (<11 ppb), none of the chemical analytes were detected in clam tissues. In the polychaete worm tissues, tissue residues were found only for 4,4'-DDD (<8.5 ppb) and 4,4'-DDE (<47 ppb).

During the Bight '03 survey, sediment from Station 4097 was evaluated for toxicity using the amphipod, *Eohaustorius estuarius*. Survival was 66% in test sediment. During the RGP-54 survey, a composite representing the Linda Isle area that included sediment from Station 2-1 was evaluated for solid-phase toxicity using the mysid (*Americamysis bahia*) and the amphipods (*E. estuarius* and *A. abdita*) and in the suspended-particulate phase (SPP) using *A. bahia*, the fish, *Menidia beryllina*, and larval bivalves (*Mytilus* sp.). Bioaccumulation was also evaluated using a clam (*Macoma nasuta*) and polychaete worm (*Nereis virens*). Little or no toxicity was observed in the solid-phase test with mysids or in the suspended-particulate phase tests. Survival in the amphipod test with *E. estuarius* was 66%. Survival in tests with *A. abdita* was 86%.

Table 2. Sediment Data from Balboa Marina (Bight 2003, NewFields/Weston 2005).

Analyte	RPG-54 2005	Bight 2003	ER-L	ER-M
	Station 2-1	Station 4097		
<b>Sediment Grain Size</b>				
Gravel	0.02	0.00	N/A	N/A
Sand	54	9.76	N/A	N/A
Silt	17.7	83.1	N/A	N/A
Clay	28.2	7.14	N/A	N/A
TOC %	0.87	2.49	N/A	N/A
<b>Metals (mg/kg dry wt)</b>				
Arsenic	7.52	9.14	8.2	70
Cadmium	0.80	1.67	1.2	9.6
Chromium	26	40.5	81	370
Copper	21	71.5	34	270
Lead	11	24.5	46.7	218
Mercury	0.31	0.09	0.15	0.71
Nickel	16.2	26.5	20.9	51.6
Selenium	0.36	2.17	N/A	N/A
Silver	0.30U	0.27	1	7
Zinc	65	178	150	410
<b>Pesticides (µg/kg)</b>				
Aldrin	0.97 U	NM	N/A	N/A
Alpha-BHC	0.97 U	NM	N/A	N/A
Beta-BHC	0.97 U	NM	N/A	N/A
Gamma-BHC	0.97 U	NM	N/A	N/A
Delta-BHC	0.97 U	NM	N/A	N/A
Chlordane	0.97 U	2.81	0.5	6
2,4' – DDD	1.9 U	4.33	2	20
2,4' – DDE	1.9 U	1.92	2.2	27
2,4' – DDT	1.9 U	1.12	1	7
4,4' – DDD	1.9 U	14.4	2	20
4,4' – DDE	3.1	70.0	2.2	27
4,4' – DDT	1.9 U	3.27	1	7
Dieldrin	1.9 U	NM	0.02	8
Enosulfan I	0.97 U	NM	N/A	N/A
Endosulfan II	1.9 U	NM	N/A	N/A
Endosulfan sulfate	1.9 U	NM	N/A	N/A
Endrin	1.9 U	NM	N/A	N/A
Endrin aldehyde	1.9 U	NM	N/A	N/A
Heptachlor	0.97 U	NM	N/A	N/A
Heptachlor epoxide	0.97 U	NM	N/A	N/A
Methoxychlor	9.7 U	NM	N/A	N/A
Toxaphene	97 U	NM	N/A	N/A

U: Detected at or below given concentration; NM: not measured; N/A: not applicable.

***Balboa Marina Dock Replacement Project:*** Sediments from four composite areas were evaluated in 2007 in support of the Balboa Marina Dock Replacement project (Figure 3). The western marina composite (WM-COMP) included stations adjacent to the Balboa Marina West project area. The key sediment characteristics for the four project composites are summarized in Table 3. Sediments from the Balboa Marina were dominated by fines, with over 80% silts and clays for each of the composites. Metals concentrations were below ERM levels; mercury concentrations ranged from 0.20 to 0.29 mg/L for the composite areas. Concentrations of organotins and PAHs were below ERM concentrations; however, DDD, DDE and PCBs were observed in test sediments. No adverse or acute or chronic effects were observed in the toxicity tests. Elevated concentrations of DDE and DDD in the tissues of the clams and worms indicated some uptake into tissues. However, using site-specific multipliers for the DDT analogs, the estimated steady-state  $\Sigma$ DDT tissue residues ranged from 46.3 to 69.7  $\mu\text{g}/\text{kg}$  ww in clams and from 156 to 237  $\mu\text{g}/\text{kg}$  ww in worms, which were below the human-health derived national criteria of 280  $\mu\text{g}/\text{kg}$  (USEPA 2000) and the proposed material was considered to be suitable for ocean disposal.

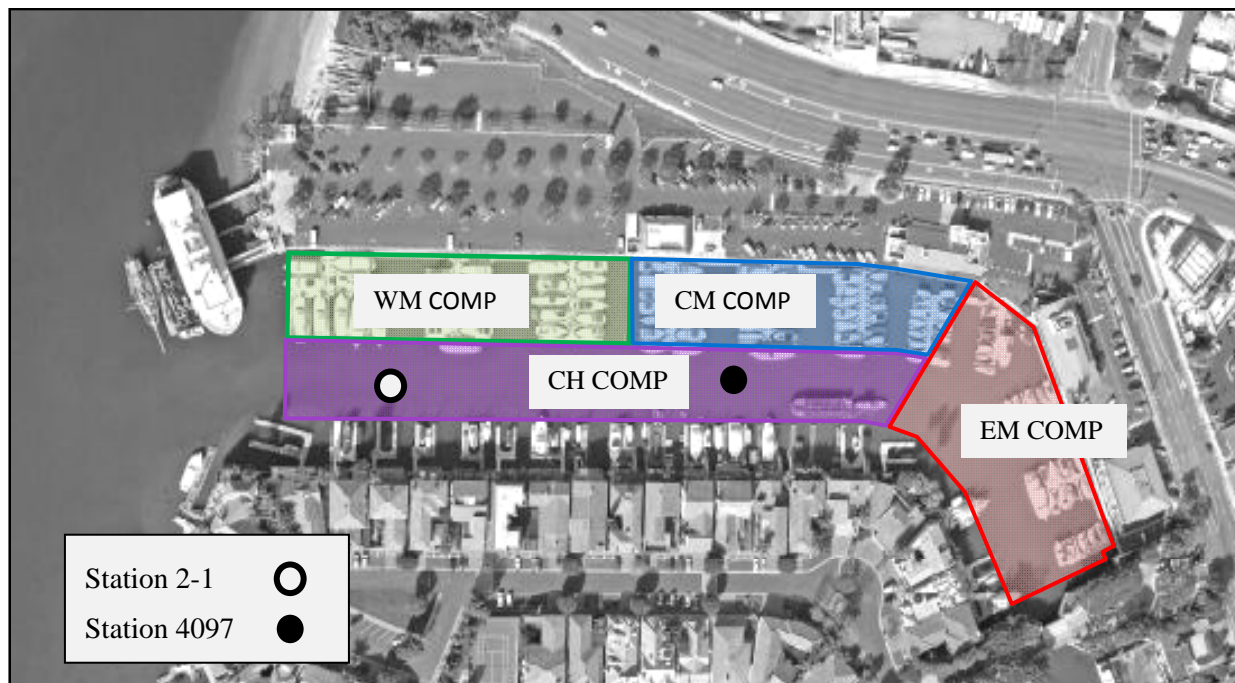


Figure 3. Composite areas for 2007 Balboa Marina Dock Replacement project. Stations for the RGP-54 study (2-1) and Bight '03 (4097) projects also noted. Note the *Reuben E Lee Riverboat* restaurant at the western end of the marina.

Table 3. Summary of Key Sediment Characteristics, Balboa Marina, May 2007

Measurement	Control	LA-3 Reference	CH-Comp	WM- Comp	CM- Comp	EM-Comp
<b>Sediment Chemistry</b>						
Fines (%)		61.4	87.5	85.8	88.4	84.1
TOC (%)		1.64	0.95	1.18	1.40	1.04
<b>Inorganics (mg/kg)</b>						
Arsenic (As)		<10	10	10	10	10
Cadmium (Cd)		0.7	1.7	1.8	1.5	1.4
Chromium (Cr)		51	47	47	51	46
Copper (Cu)		29.7	60.1	67.6	95.7	89.9
Lead (Pb)		13	33	36	37	37
Mercury (Hg)		<0.09	0.23	0.29	0.24	0.20
Nickel (Ni)		24	28	27	29	26
Selenium (Se)		<1	<0.9	<1	<1	<1
Silver (Ag)		<0.7	<0.6	<0.6	<0.6	<0.6
Zinc (Zn)		91	165	172	206	199
<b>Organics (µg/kg)</b>						
TBT (µg/kg)		<3.8	15	6.3	14	11
Total PAHs (µg/kg)		83	312	402	405	318
Chlorinated Pesticides		ND	ND	ND	ND	ND
Total DDT (µg/kg)		18.6	124	117	55.3	84
Total PCBs (µg/kg)		ND	53	198	110	55
<b>Benthic and Water Column Toxicity Evaluations (Percentage Survival or Normal Development)</b>						
10-d Amphipod Benthic <i>Ampelisca abdita</i>	96	94	90	88	87	92
10-d Mysid Benthic <i>Americamysis bahia</i>	94	90	88	88	82	90
96-h Fish Water column <i>M. beryllina</i> (LC50)	96	NA	>100%	>100%	>100%	>100%
96-h Mysid Water column <i>A. bahia</i> (LC50)	98	NA	>100%	>100%	>100%	>100%
96-h Fish Water column <i>Mytilus edulis</i> (LC50)	94	NA	>100%	>100%	>100%	>100%
<b>Bioaccumulation (µg/kg wet wt)</b>						
<i>M. nasuta</i>						
Lipids (% ww)		0.407	0.380	0.395	0.399	0.447
Σ DDT		3.92	30.4	27.1	20.8	24.5
Σ PCBs		0	0	8.81	7.68	4.00
<i>N. caecoides</i>						
Lipids (% ww)		1.13	1.12	1.16	1.17	1.09
Σ DDT		6.6	103	105	70.1	77.4
Σ PCBs		0	10.9	52.3	10.2	7.9

NA: Not applicable; ND: Not detected

## 2. METHODS

The objective of this sampling and analysis program (SAP) was to characterize the proposed dredged materials from areas within Balboa Marina West project footprint. Dredged material from this project is proposed for placement at the USEPA-designated LA-3 Ocean Dredged Material Disposal Site (LA-3 ODMDS) based upon criteria outlined in the OTM (USEPA AND USACE 1991). If possible, beneficial reuse will be considered based on guidance provided in the ITM (USACE/USEPA 1998).

### 2.1 Sampling Strategy

Sediment cores were collected from two composite areas to project depth plus 2 feet of overdredge. Composite A included areas that are currently near or below 0 ft. MLLW with project depths of -6 ft. MLLW to -10 ft. MLLW. Composite B included areas that are currently above 0 ft. MLLW, with project depths of 0 ft. MLLW to -6 ft. MLLW. Sample locations were placed to create composites that are representative of the relative proportions in the proposed dredge material. Sample locations are presented in Figures 4 and 5 and in Table 4. Station B-1 which is in the nearshore area to the north of the marina parking area was included in the Area A composite as it was more similar to the marine sediment in Area A as opposed to the fill from Area B. This is discussed further in the results section.

Cores in the marine portions of the site were collected using a vibracore sampler. Soils and sediments from the upland portions of the site were collected using an direct-push corer. Material above the MHHW mark (+5.4 ft. MLLW) was not included in the sample composites. Cores from each station were homogenized, with a subsample archived for future analysis. A second subsample from each core was submitted for conventional analysis (grain size and total organic carbon). All remaining sediment from each station was then combined with the other area subsamples to create an area composite. An Area A and Area B composites were submitted for chemical and biological analyses. A “z-layer” sample was collected from each station. The z-layer represents the sediment that would remain after dredging and was comprised of the bottom 6” of the sediment core, beyond the overdredge depth. The z-layer samples were archived for potential future analysis depending upon the characterization of the project sediments.

Chemical analysis of the test and reference material included metals, organotins, pesticides, PCB congeners, PAHs, and pyrethroids. Conventional analyses included total sulfides, ammonia, percent solids, total organic carbon (TOC), and sediment grain size. The benthic tests were conducted with the amphipod, *Ampelisca abdita* and the polychaete, *Neanthes areanaceodontata* with both the test composites and the reference sediment. Water-column bioassays were conducted with mysids, fish, and larval bivalves or echinoderms. Bioaccumulation tests with a bivalve and polychaete worm were conducted with the test composite A and the reference sediment. Tissue chemistry was limited to mercury based on the sediment chemistry and consultation with representatives of the USACE-LA and USEPA.

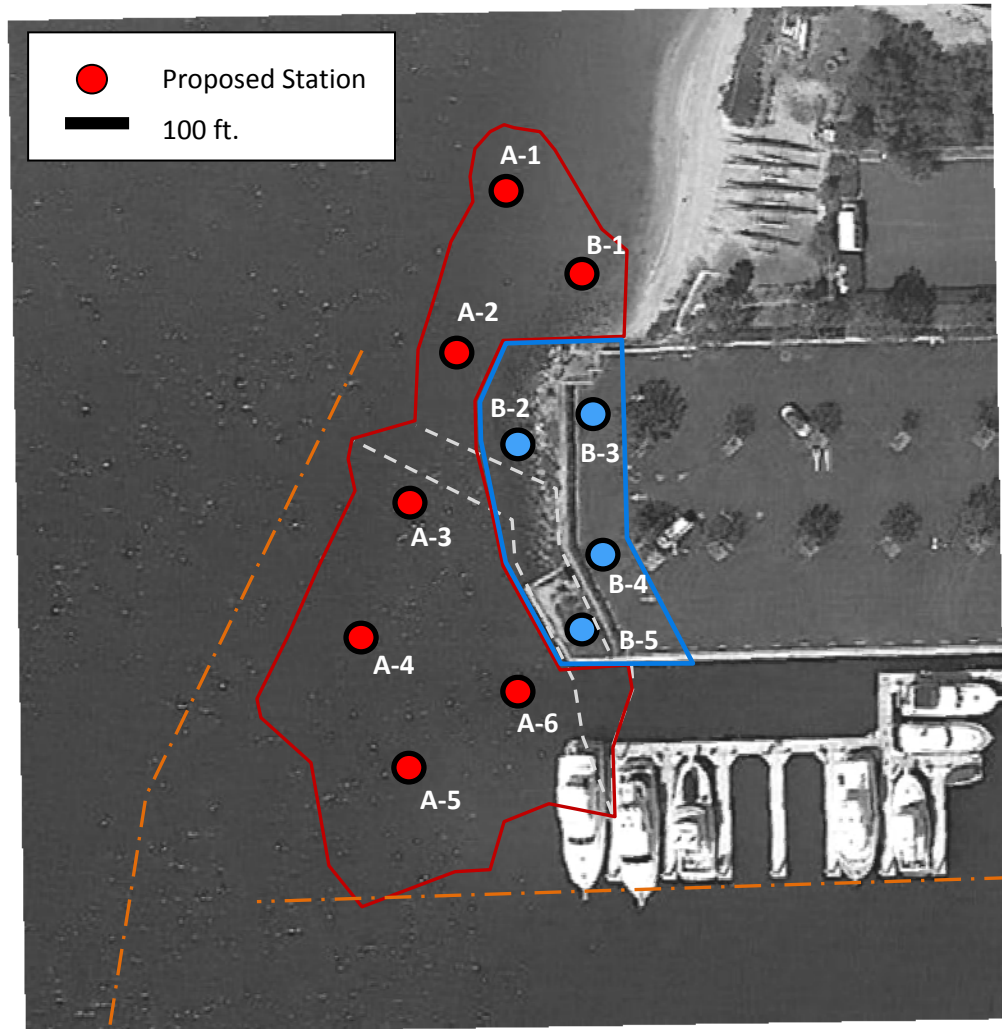


Figure 4. Station Locations for the Balboa Marina West project.

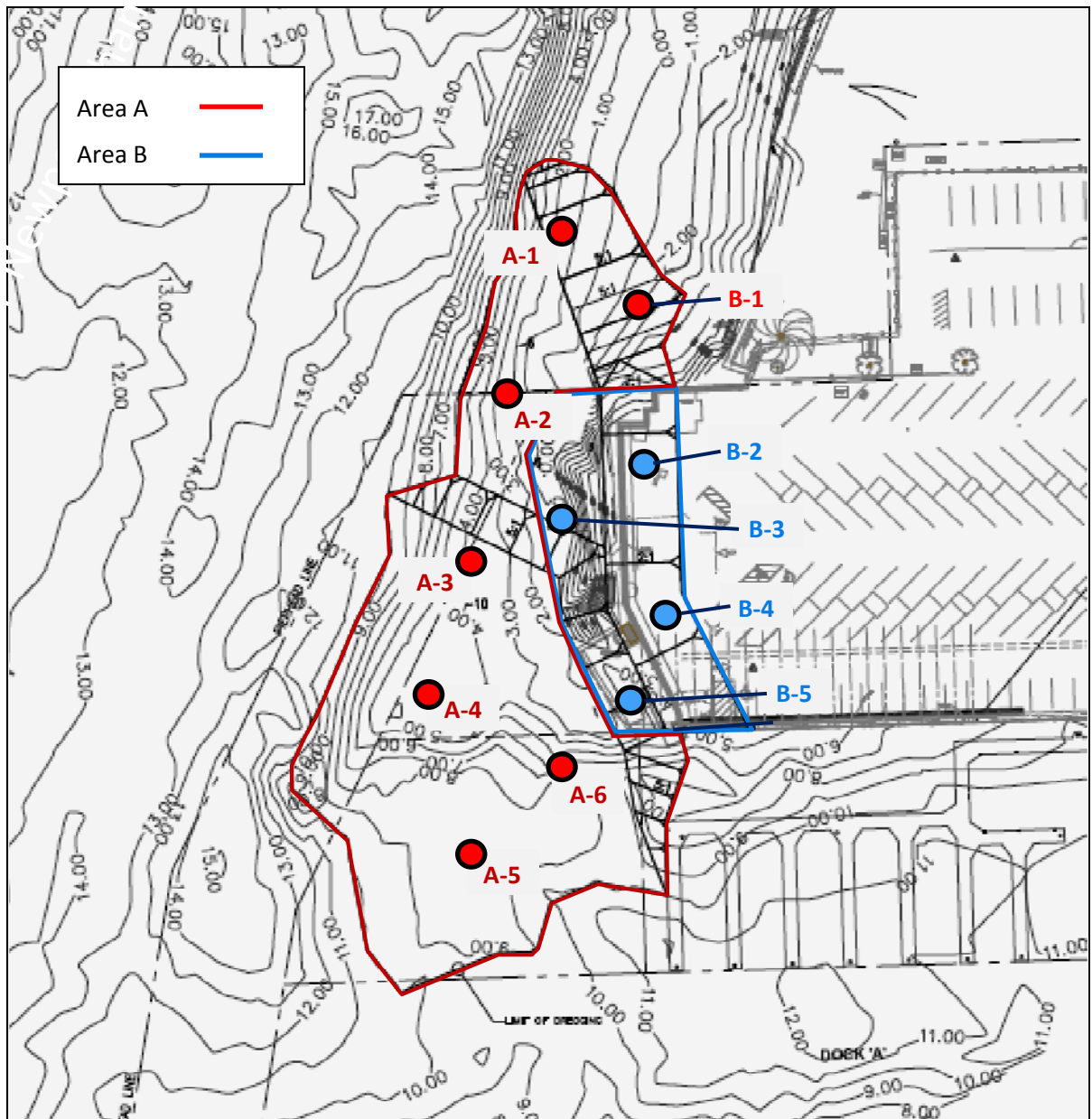


Figure 5. Project Area Bathymetry and Station Locations



Table 4. Proposed Station Numbers and Target Locations with Approximate Coordinates

Study Area	Station	Approximate Station Coordinates		Depth (ft MLLW)	Proposed Depth (ft. MLLW)	Proposed Core Length
		Latitude (°N)	Longitude (°W)			
Area A	A-1	33° 36.971'	117° 54.268'	-1.5	-6 (+2 OD) + "z"	6.5
	A-2	33° 36.966'	117° 54.270'	-2.0	-6 (+2 OD) + "z"	6.0
	A-3	33° 36.954	117° 54.273'	-4.0	-10 (+2 OD) + "z"	8.0
	A-4	33° 36.944'	117° 54.278'	-5.0	-10 (+2 OD) + "z"	7.0
	A-5	33° 36.933'	117° 54.272'	-8.0	-10 (+2 OD) + "z"	4.0
	A-6	33° 36.940'	117° 54.265'	-6.0	-10 (+2 OD) + "z"	6.0
	B-1	33° 36.971'	117° 54.260'	+2.0	-6 (+2 OD) + "z"	10.0
Area B	B-2	33° 36.961'	117° 54.259'	+5.4 <sup>a</sup>	-2 (+2 OD) + "z"	9.4
	B-3	33° 36.957'	117° 54.266'	+1.0	-2 (+2 OD) + "z"	5.0
	B-4	33° 36.950'	117° 54.258'	+5.4 <sup>a</sup>	-6 (+2 OD) + "z"	13.4
	B-5	33° 36.945'	117° 54.260'	+5.4 <sup>a</sup>	-8 (+2 OD) + "z"	15.4

a: material above MHHW will not be included in the analytical composite or samples.

## 2.2 Field Collection Program for Sediment Cores

Sampling was conducted July 10-19, 2013. Cores in the marine areas were collected aboard a 27' research vessel owned and operated by Tierra Data Incorporated of Escondido, California. Sampling locations were determined using a WAAS enabled GPS assisted by triangulation with visual landmarks and water depth. Final station locations were recorded in the field using positions from the on board DGPS. Sediment was collected to project depth plus 2 ft. of overdredge using an electric vibracorer equipped with pre-cleaned 4-inch diameter aluminum tube and a stainless steel cutter head/catcher assembly. If refusal was encountered prior to attaining proposed depth, the vessel was moved and another attempt was made.

Once on board the sampling vessel, each core was characterized for length and geotechnical characteristics. A representative core from each sample location was photographed. The geologic description of each core included the texture, odor, color, length, approximate grain size distribution, and any evident stratification of the sediment.

Upland cores were collected using a truck-mounted drill in direct-push mode with lexan core liners. Direct-push cores were collected in 4-ft sections, with some compaction observed in the coarser upper level soils.

Sediment from each station was placed into clean, food-grade-quality plastic bags, labeled (project name, station, date, sampler ID, analysis, and preservative where applicable), logged into a field chain-of-custody (COC) form, and placed into a cooler. Cores remained on ice and in the dark until they were shipped via overnight delivery service to the NewFields laboratory in Port Gamble, Washington for processing.

Sample processing and composting was performed at NewFields Port Gamble laboratory. Station samples were stored in the dark in a 4 degrees Celsius (°C) cold room until they were processed. Sediment from each station was homogenized in a clean stainless-steel bowl using a stainless-steel spoon and then subsampled into a certified clean glass jar for station archive. The remaining sediment was placed into a clean, Teflon-coated cement mixer. All sediment representing a given area composite was homogenized and then subsampled for chemical analysis, biological testing and archive. Samples for physical and chemical analysis were placed into certified clean glass jars with Teflon-lined lids and shipped to the analytical laboratories. Sub-samples for archive were placed in certified clean glass jars with Teflon-lined lids and frozen at -20°C for possible future chemical analysis in the event that further delineation of chemical contamination is required. A summary of analytical laboratories and contact information is provided in Table 5.

Table 5. Analytical Laboratories, Points of Contact, and Shipping Information

Laboratory	Analyses Performed	Point of Contact	Shipping Information
NewFields, Northwest	Archival sediment; Water Column and Benthic Tests	Mr. William Gardiner (360) 297-6080	NewFields Northwest 4729 NE View Drive Port Gamble Washinton 98364
NewFields, Northwest	Bioaccumulation testing	Mr. William Gardiner	NewFields Northwest 4729 NE View Drive Port Gamble Washinton 98364
Analytical Resources Inc	Sediment and bioaccumulation tissue chemistry	Ms. Sue Dunninghoo (206) 695-6200	Analytical Resources, Inc. 4611 S.134 <sup>th</sup> Pl, Suite 100 Tukwila, WA 98168
PHYSIS Environmental Labs, Inc.	Sediment pyrethroids	Misty Mercier (714) 335-5918	PHYSIS Environmental Labs, Inc. 1904 E. Wright Circle, Anaheim CA 92806

In addition to the project sediment, a reference sediment sample was collected from the USACE-USEPA approved reference sediment sampling location for disposal sites. Reference sediment was collected using a stainless-steel dredge bucket. Control sediment was provided with the bioassay test organisms where appropriate (i.e., water column tests did not use a control sediment). A sample of site water (approximately 40 L) was collected from the Newport Bay area and used in preparation of the 100 percent elutriate concentrations for the water column tests.

The reference samples provide a point of comparison for material proposed for disposal at ocean disposal sites. Reference stations for LA-3 were established at the following EPA designated locations:

Station	Latitude (N)	Longitude (W)	Depth
LA-3	33° 31.70'	117° 51.30'	~450 m

## 2.3 Physical and Chemical Analyses

Physical and chemical parameters that were measured in this testing program were selected to provide data on potential chemicals of concern in the dredged material from the site, in accordance with the OTM (USEPA/USACE 1991), ITM (USEPA/USACE 1998), and regional guidance. Test composites and reference sediment were analyzed for all of the analytes listed in Table 6. All analytical methods used to obtain contaminant concentrations follow EPA or Standard Methods (SM; APHA/AWWA 1998).

### *Physical Analyses*

Tests were performed to determine the physical characteristics of the sediment for potential beach nourishment, to predict the behavior of sediment after disposal, and to compare reference and test sediment. Physical-chemical analyses of the sediment included grain size, specific gravity, total organic carbon (TOC), and total solids. Grain size was analyzed to determine the general size classes that make up the sediment (e.g., gravel, sand, silt, and clay). Grain size was conducted using the gravimetric procedure described in Plumb (1981). The TOC, made up of volatile and nonvolatile organic compounds, was determined as recommended in the OTM (USEPA/USACE 1991) or equivalent (modified SW846). This procedure involved dissolving inorganic carbon (carbonates and bicarbonates) with hydrochloric acid or sulfuric acid prior to TOC analysis (Plumb 1981). Total solids were also measured to convert concentrations of the chemical parameters from a wet-weight to a dry-weight basis. Percent solids were determined by USEPA Method 160.3 (USEPA 2001).

### *Sediment Chemistry*

The following analyses were performed as recommended by the OTM (USEPA/USACE 1991). The analysis for priority pollutant metals was conducted using an inductively coupled plasma emissions spectrometer equipped with a mass detector (ICP-MS), in accordance with USEPA 6020. Mercury analysis was conducted using cold vapor atomic absorption (CVAA) according to EPA 7471A (USEPA 1994). Ammonia and dissolved sulfides analysis was conducted in conjunction with toxicity testing and follow SM4500-NH3F and N (APHA/AWWA 1998). Total sulfides were analyzed following PSEP (1986).

Semivolatile organics (SVOC; PAHs only) were analyzed using gas chromatography-mass spectrometry with selected ion monitoring (GC/MS SIM), using USEPA Method 8270 SIM (USEPA 2001). This followed serial extraction with methylene chloride and alumina cleanup procedures. Organochlorine pesticides and PCB congeners were analyzed using dual column GC/ECD following USEPA Method 8081 and 8082, respectively (USEPA 2001), with extraction modifications to reach lower detection limits. The analytical method used to determine TBT involved methylene chloride extraction, followed by Grignard derivatization and analysis by GC/MS (Krone et al., 1989). Pyrethroids were analyzed by negative chemical ionization (NCI-GCMS).

Table 6. Chemical and Physical Parameters, Analytical Methods, and Target Detection Limits

Parameter	Method	Procedure	Sediment Target Reporting Limit (dry weight)	Tissue Target Reporting Limit (wet weight)
<b>Physical / Conventional Tests</b>				
Grain Size	Plumb (1981)	Sieve/Pipette	1.0%	n/a
Specific Gravity	Plumb (1981)	Gravimetric	0.001 g/cc	n/a
TOC	ASTM D2579	Combustion IR	0.1%	n/a
Percent Solids	EPA 160.3	Gravimetric	0.1%	n/a
Percent Volatile Solids	EPA 160.3	Gravimetric	0.1%	n/a
Sulfides	SM4500	Titrametric	0.05 mg/kg	n/a
Dissolved Sulfides	SM4500	Titrametric	0.01 mg/L	n/a
Ammonia	SM 4500N H3F	ICP-MS	0.001 mg/kg	n/a
Lipids	Bligh Dyer	Gravimetric	n/a	0.1%
<b>Metals</b>				
Arsenic (As)	USEPA 6020	ICP-MS	0.5 mg/kg	0.5 mg/kg
Cadmium (Cd)	USEPA 6020	ICP-MS	0.2 mg/kg	0.2 mg/kg
Chromium (Cr)	USEPA 6020	ICP-MS	0.5 mg/kg	0.5 mg/kg
Copper (Cu)	USEPA 6020	ICP-MS	0.5 mg/kg	0.5 mg/kg
Lead (Pb)	USEPA 6020	ICP-MS	1.0 mg/kg	1.0 mg/kg
Mercury (Hg)	USEPA 7471A	CVAA	0.05 mg/kg	0.01 mg/kg
Nickel (Ni)	USEPA 6020	ICP-MS	0.5 mg/kg	0.5 mg/kg
Selenium (Se)	USEPA 6020	ICP-MS	0.5 mg/kg	0.5 mg/kg
Silver (Ag)	USEPA 6020	ICP-MS	0.5 mg/kg	0.5 mg/kg
Zinc (Zn)	USEPA 6020	ICP-MS	4 mg/kg	4 mg/kg
<b>Pesticides</b>				
4-4' DDD	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
4-4'-DDE	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
4-4'-DDT	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
2-4' DDD	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
2-4'-DDE	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
2-4'-DDT	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
Aldrin	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
α-BHC	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
β-BHC	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
Chlordane	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
δ-BHC	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
Dieldrin	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
Endosulfan I	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
Endosulfan II	USEPA 8081	GC/ECD	2 µg/kg	30 µg/kg
Endosulfan Sulfate	USEPA 8081	GC/ECD	1 µg/kg	30 µg/kg
Endrin	USEPA 8081	GC/ECD	1 µg/kg	30 µg/kg
Endrin Aldehyde	USEPA 8081	GC/ECD	1 µg/kg	30 µg/kg
Heptachlor	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
Heptachlor Epoxide	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
γ-BHC	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
Methoxychlor	USEPA 8081	GC/ECD	10 µg/kg	200 µg/kg
Lindane	USEPA 8081	GC/ECD	1 µg/kg	10 µg/kg
Toxaphene	USEPA 8081	GC/ECD	100 µg/kg	1000 µg/kg

Parameter	Method	Procedure	Sediment Target Reporting Limit (dry weight)	Tissue Target Reporting Limit (wet weight)
<b>PCB Congeners</b>				
PCBs 8, 18, 28/31, 33, 44, 49, 52, 55/60, 66/95, 70, 74, 87, 97, 99, 101, 105/132, 110, 118, 138, 141, 149, 151, 153, 156, 158, 170, 174, 177, 180, 183, 187, 194, 195, 201, and 203	USEPA 8082	GC/ECD	1 µg/kg	1 µg/kg
<b>Semivolatile Organics</b>				
Acenaphthene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Fluorene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Phenanthrene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Anthracene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Fluoranthene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Pyrene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Chrysene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Benzo(a)anthracene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Benzo(b)fluoranthene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Benzo(a)pyrene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Indeno(1,2,3-cd)pyrene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Dibenzo(a,h)anthracene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
Benzo(g,h,i)perylene	USEPA 8270	GC/MS SIM	7 µg/kg	30 µg/kg
<b>Organotins</b>				
Monobutyltin	Krone et al. (1989)	GC/MS SIM	10 µg/kg	40 µg/kg
Dibutyltin	Krone et al. (1989)	GC/MS SIM	10 µg/kg	40 µg/kg
Tributyltin	Krone et al. (1989)	GC/MS SIM	10 µg/kg	40 µg/kg
<b>Pyrethroids</b>				
Pyrethroids	USEPA 8270C-NCI	GC/MS-NCI	2 µg/kg	--

%: percent      ng/kg: nanogram per kilogram      GC/MS: gas chromatography/mass spectrometry  
 µg/kg: microgram per kilogram      SIM: selected ion monitoring      g/cc: gram per cubic centimeter  
 \* EPA Method 1664 is substituted for EPA 413.2      n/a: not applicable

## 2.4 Bioaccumulation Tissue Chemistry

Tissue analysis was performed to determine the availability of sediment contaminants for uptake into the tissues of test organisms. The chemical constituents for tissue analysis (including pre-exposure samples) were based on the results of the sediment chemistry analysis. NewFields consulted with USACE and USEPA to determine an appropriate tissue analyte list. Based on review of the sediment chemistry results, tissue composites from each replicate were separately analyzed for mercury.

## 2.5 Bioassay Testing

This section summarizes the test methods that were used to conduct the benthic, water column and bioaccumulation potential (BP) tests. All sediment samples were evaluated in accordance with procedures outlined the OTM/ITM (USEPA/USACE 1991, 1998). This program included

bioassay analysis of the two test composite samples and the LA-3 reference sample. In addition, appropriate laboratory control samples were run with each of the selected test species. Ammonia and sulfide concentrations in composite sample pore-water were analyzed prior to bioassay testing to determine whether purging would be necessary prior to solid phase testing. Bioassay testing for this project consisted of two benthic toxicity tests, three water-column toxicity tests, and two bioaccumulation tests.

### **Water Column Testing**

Water-column bioassay tests were performed to estimate the potential impact of aquatic disposal of dredged material to organisms that live in the water column. Table 7 provides a summary of testing conditions for three different water column species. The water column test was performed using a 4:1 dilution by volume seawater to test dredged material. Sediment from each composite was combined with dredging-area site seawater in a 4:1 ratio by volume, vigorously agitated for 30 minutes, and then centrifuged for 15 minutes at 980 g. Following settling, the supernatant was gently decanted. This supernatant represents the 100% test concentration and is used to create serial dilutions with clean seawater (0.45- $\mu$ m-filtered Hood Canal seawater) to create subsequent test concentrations for the water column tests. Three species were included in this program: *Mytilus* sp. (bivalve larvae), *Americamysis bahia* (mysid shrimp), and *Menidia beryllina* (inland silverside fish).

The bivalve larvae test was run on the test sediment elutriates at 100%, 50%, 10%, 1% and a seawater control. There were five replicates per elutriate; a surrogate replicate was also set up for use in water quality measurements. The test was run for 48 hours or longer to ensure development of the bivalve larvae to the D-hinge stage in the control. At the termination of the study, survival and normal development were compared between the control and test groups to determine if significant mortality or abnormal development exists.

For the mysid and fish, the water column was tested at 100%, 50%, 10% and a seawater control under static conditions. Each of these tests were conducted in accordance with procedures outlined in the OTM (USEPA/USACE 1991). Ten animals were used per replicate with five replicates per elutriate concentration and a surrogate replicate for water quality measurements. Each test was run for 96 hours.

Daily water quality monitoring of test chambers was carried out for pH, dissolved oxygen, salinity, and temperature. Ammonia and sulfides were analyzed at the start and end of the test in the 100% concentration. Measurements in other concentrations would only be performed if the readings in the 100% concentration were greater than 4 mg/L total ammonia. To evaluate the relative sensitivity of test organisms, reference toxicity tests were performed using reference toxicants (Lee 1980). The sensitivity of test organisms used during the current evaluation were compared to those tested previously.

Table 7. Summary of Test Conditions for the Water Column Tests

Test Condition	Water Column Test Species		
<b>Test Organism:</b>	<i>Americamysis bahia</i>	<i>Menidia beryllina</i>	<i>Mytilus</i> sp.
Age of Organism:	1-5 day; 24 h range	9 – 14 days day; 24 h range	larvae, post fertilization
Test Type:	Static non-renewal	Static non-renewal	Static non-renewal
Duration:	96 h	96 h	48 h
Test Chamber:	250 mL minimum	250 mL minimum	20 mL scintillation vials
# Organisms /Jar:	10	10	15 to 30 /mLs
Test Volume:	200 mL minimum	200 mL minimum	10 mL
Replicates:	6 (5 + WQ rep)	6 (5 + WQ rep)	6 (5 + WQ rep)
Sediment Holding Time	< 8 weeks	< 8 weeks	< 8 weeks
<b>Water Quality:</b>			
Temperature:	20°C ± 1°C	20°C ± 1°C	16°C ± 1°C
Salinity:	Ambient ± 2 ppt	Ambient ± 2 ppt	Ambient ± 2 ppt
Dissolved Oxygen:	≥ 40 % saturation	≥ 40 % saturation	≥ 4.0 mg/L (no air unless needed)
<b>Dilution water</b>	Natural seawater	Natural seawater	Natural seawater
<b>Test concentrations</b>	Three concentrations 100, 50, and 10%	Three concentrations 100, 50, and 10%	Four concentrations 100, 50, and 10%, and 1%
<b>Feeding Schedule:</b>	Daily	Daily	none
Ration/Diet	<i>Artemia</i> solution 0.2 mL of <24 h old (about 100 nauplii)	<i>Artemia</i> solution 0.2 mL of <24 h old (about 100 nauplii)	none
<b>Lighting quality</b>	Ambient lighting	Ambient lighting	Ambient lighting
Photoperiod	16L/8D	16L/8D	16L/8D
<b>Endpoints:</b>	Survival	Survival	Survival to normal larvae to D-stage
<b>Test acceptability criteria</b>	≥ 90% survival in control	≥ 90% survival in control	≥70% normal shell development in control
<b>Reference Toxicant</b>	Ammonia	Ammonia	Ammonia

### Benthic Testing

Benthic bioassays were performed to estimate the potential impact of aquatic disposal of the proposed dredged material on benthic organisms that attempt to re-colonize the area. Sediment was evaluated in 10-day benthic tests using an amphipod species, *Ampelisca abdita*, and polychaete worm, *Neanthes arenaceodentata*. Amphipod testing was conducted in accordance with procedures described in Appendix E of the ITM (USEPA/USACE 1998) and ASTM Standard E1367-99 (ASTM 2003c) and outlined in Table 8. Tests with the polychaete were conducted in accordance with procedures outlined in the ITM (USEPA/USACE 1998). Each sediment type (test and control) were run with five replicates. Control sediment was sediment from the area where the organisms were collected (i.e., native sediment).

Test organisms were exposed in a static system to the sediment for ten days in 1-liter glass test chambers. Two centimeters of sediment (approximately 150 mL) was placed into each chamber with 800 mL of overlying water. Test sediments from the Area B composite included some buried terrestrial soils. In some cases, deep terrestrial soils can require acclimation to marine conditions prior to testing. This allows for the development of a marine microbial

community, controlling ammonia and other biochemical processes in the test chambers. Acclimation is typically an issue related to benthic toxicity tests and is manifested by gradually increasing ammonia concentrations in the overlying water and porewater followed by a decline once the sediments have acclimated. While acclimation may be monitored using overlying water measurements, the interstitial porewater ammonia concentrations are the best indication of exposure to ammonia for benthic organisms. As such, both overlying water and porewater ammonia were monitored during the acclimation period. The following section provides detail regarding the acclimation step for the Area B composite. The Area A composite, the LA-3 Reference, and the control sediment were not acclimated prior to testing, but were loaded into test chambers once the Area B composite was acclimated. All test, reference, and control treatments will be tested concurrently.

The Area B composite was acclimated prior to conducting the benthic tests with both amphipods and polychaetes. The test sediment was placed in test chambers as per the standard method, with approximately 150 mL of test sediment and 800 ml of clean, 0.45- $\mu$ m-filtered laboratory seawater. For acclimation, an additional 8 test chambers were set up as sacrificial chambers to allow for porewater ammonia monitoring prior to and during the benthic tests. Test chambers were then placed on the water-tables and held under test conditions during acclimation. Ammonia was monitored in surrogate test chambers prior to test initiation to indicate whether acclimation has occurred. Overlying water ammonia was monitored daily to determine whether there are increases in ammonia concentrations. In addition, porewater ammonia was monitored every third day for the first 12 days. The overlying water ammonia did not show a marked increase and the porewater ammonia remained below 15 mg/L (NOEC for *Ampelisca abdita*). At the end of the acclimation period, the Area A composite, reference treatment and control were loaded into test chambers per the standard method and allow to equilibrate overnight.

Initial stocking densities in each replicate were 20 organisms per test chamber for the amphipod test, and 5 organisms per test chamber for the polychaete test. Trickle-flow aeration was provided through glass pipettes, in such a way as to avoid disturbing the sediment surface. Water quality measurements were taken in one chamber from each test treatment daily and included pH, salinity, temperature, and dissolved oxygen. Ammonia and sulfides were measured in both interstitial (pore water) and overlying water at the start and finish of the test from one replicate for each test sample. Sediment pore water was extracted via centrifugation. All instruments used were calibrated and logged daily. Using methods described in the ITM (USEPA/USACE 1998), the sediments were carefully sieved to remove the test organisms, and then survivorship was assessed. To evaluate the relative sensitivity of the organisms, reference toxicity tests were performed using standard reference toxicants (Lee 1980).



Table 8. Summary of Test Conditions for the Benthic Tests

Test Condition	Test Species	
	<i>N. arenaceodentata</i>	<i>A. abdita</i>
<b>Test Organism:</b>		
Age of Organism:	2 to 3 weeks	3 – 5 mm mixed sexes
Test Type:	Static, Non-renewal	Static, Non-renewal
Duration:	10-d	10-d
Test Chamber:	1-L	1-L
# Organisms /Jar:	10	20
Test Sediment Volume/ Seawater Volume	200 mL/800 mL	2 cm minimum/900mL
Sediment holding time	< 8 weeks	< 8 weeks
Replicates:	6 (5 + WQ rep)	6 (5 + WQ rep)
<b>Water Quality:</b>		
Temperature:	20°C ± 1°C	20°C ± 1°C
Salinity:	28 to 30 ppt	28 to 30 ppt
Aeration	Trickle-flow(<100 bubbles/min.)	Trickle-flow (<100 bubbles/min.)
Ammonia/Sulfides:	Day 0 and 10	Day 0 and 10
<b>Lighting quality</b>	ambient	ambient
Photoperiod	12L/12D	Continuous
<b>Endpoints:</b>	Survival	Survival
<b>Test acceptability criteria</b>	≥ 90% survival in control	≥ 90% survival in control
<b>Reference Toxicant</b>	Ammonia	Ammonia

### ***Benthic Bioaccumulation Testing***

Assessment of bioaccumulation was carried out using the polychaete worm *Nephtys caecoides* and the bivalve *Macoma nasuta* over a 28-day test period. Bioaccumulation tests were conducted in accordance with Appendix E of the ITM (USEPA/USACE 1998) and summarized in Table 9. Each test was initiated using test, reference, and control sediments in the same manner as the 10-day benthic test. Background tissue samples were archived for both in the event that a baseline tissue concentration is required. Five replicate tests were performed for each composite sample. *N. caecoides* and *M. nasuta* were tested in the same aquaria using a minimum of 65 animals per replicate for the polychaete and a minimum of 25 animals per replicate for the bivalve. The test chambers were maintained under flow-through conditions and daily water quality measurements were taken on each chamber. On Day 28, the sediment was sieved to remove the worms and clams. The surviving animals were placed in clean flow-through aquaria to purge their gut contents for 24 hours, after which tissues were placed into certified-clean glass sample jars, frozen and sent to the chemistry laboratory for tissue analysis.

The analysis of bioaccumulation was made by statistically comparing tissue levels from the test group to data from the reference area for each species. The analysis can be conducted using Analysis of Variance, t-tests, or non-parametric tests, depending on the assumptions of the individual tests (i.e., homogeneity of variance) as specified in the ITM (USEPA/USACE 1998). Contaminant concentrations found to be significantly elevated above reference will be interpreted in light of criteria specified in the ITM, comparisons to Federal Food and Drug Administration limits.

Table 9. Summary of Test Conditions for the Bioaccumulation Potential Tests.

Test Conditions	
Test Procedures	ITM (USEPA/USACE 1998)
Test type/duration	28-day static with flow through
<b>Water Quality</b>	
Test temperature	Recommended: $14 \pm 2$ °C
Test Salinity	Recommended: $32 \pm 2$ ppt
Test dissolved oxygen	Recommended: $> 4.5$ mg/L
Test pH	Recommended: $7.8 \pm 0.5$
Test photoperiod	16 hours light: 8 hours dark
Test chamber	Glass Aquaria (10 gal volume)
Replicates/treatment	5
Organisms/replicate	<i>M. nasuta</i> = 25, <i>N. caecoides</i> =65
Exposure Volume	1 L sediment
Feeding	None
Water renewal	Flow-through $14 \pm 4$ ml/sec

### Seawater for Bioassay Testing

For the water-column tests, dredge site water from Lower Newport Bay was used to create the elutriate preparations. The elutriate preparations involved the use of the dredged material (sediment) and unfiltered dredging site water which were combined in a sediment-to water volumetric ratio of 1:4. All other seawater used for the biological tests, including the flow-through studies, came from the northern Hood Canal at Port Gamble, Washington. This seawater source has been used successfully on similar bioassay testing programs. Extensive testing on a variety of test species has shown that there is no significant potential for toxicity or bioaccumulation from these water supplies. The use of seawater from Port Gamble is allowed for in guidance provided in the ITM (1998- Table 8-1 and section 11.1.4). Good survival of organisms in control sediment has been achieved consistently in previous dredged material testing conducted by the laboratory.

## 2.6 Quality Assurance/Quality Control

The Quality Assurance/Quality Control requirements for this project provide confidence in the data results through a system of quality control checks on data collection methods, laboratory analysis, data reporting, and appropriate corrective actions to achieve compliance with established performance and data quality criteria.

To assess the quality of data resulting from the analytical chemistry program, the following QA/QC measures were included in the analytical program:

- Procedural blanks were performed to check for artifacts associated with sample extraction and analysis. Procedural blanks were performed at a rate of one per 20 samples or each analytical batch.
- Sufficient sample volume was supplied to the laboratory in order to perform matrix spike/matrix spike duplicate (MS/MSD). MS/MSD samples evaluated analytical accuracy

and precision. MS/MSD samples were performed at a frequency of one per 20 (5%) investigative samples or each analytical batch.

- Laboratory duplicate samples were performed to check precision of the analytical process. Lab duplicate samples were conducted at a frequency of one per 20 (5%) investigative samples or one per analytical batch.
- A standard reference material was conducted when appropriate to evaluate the analytical accuracy. An SRM sample was conducted at a frequency of one per 20 samples (5%) or one per analytical batch.

### **3. RESULTS**

#### **3.1 Sampling Results**

Sediment cores were collected from a total of 13 stations from July 10 to July 19, 2013 (Figure 6). Station location, depth (MLLW), targeted core length, and length of core recovered are included in Table 10. The reference sample was collected from the LA-3 Reference on July 14, 2013. Field logs are presented in Appendix A. Photos of the collected cores are presented following the logs in Appendix B.

The location of each sediment core relative to the proposed core location is provided in Figure 6. Cores were generally located at the proposed station location. Stations A-4 and A-5 were moved slightly shoreward as the proposed stations were already at or near project depth. This was likely due to recent dredging as part of the Lower Newport Bay dredging program. Vibracore sampling of sediment from Station B-1 was attempted during the marine sampling however, large boulders and hardpan prevented penetration. This station was subsequently moved north and slightly shoreward and collected with a hand auger.

Cores were collected from each of the proposed upland stations as well as two additional sampling locations. The core from Station B-5 was collected using a hand auger due to access limitations. Sediment was successfully sampled to approximately 0 ft. MLLW, however, sloughing of sediment prevented collection of sediment to full sampling depth. A second station, Station B-5a, was added as close as practicable to Station 5 to allow sampling to full project depth. An additional station, Station B-1a was added in the upland area to allow sufficient volume for the Area B composite and to better represent the northern portion of the upland area.

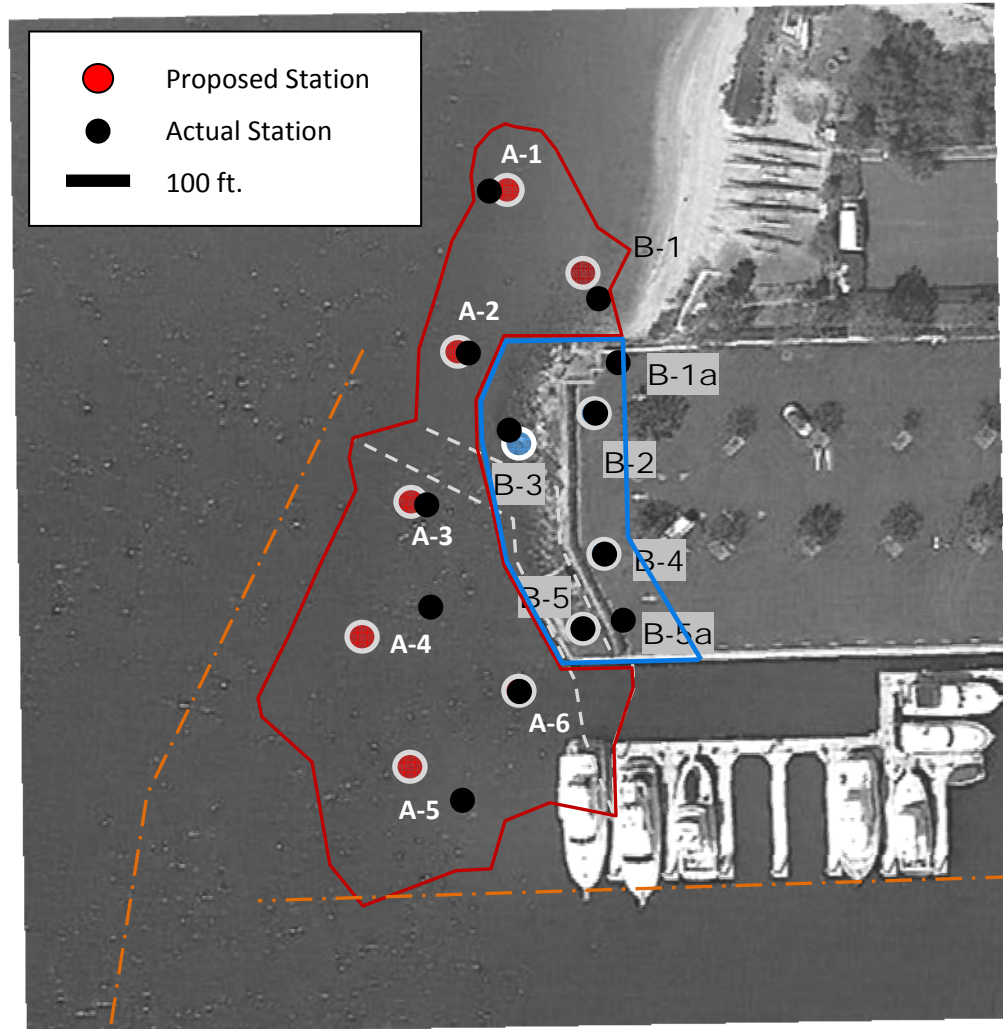


Figure 6. Station Locations for the Balboa Marina West project. The Area A boundary has been modified from the proposed sampling design to reflect the inclusion of Station B-1 in the Area A composite. See Section 3.2 for explanation.

Table 10. Station Location and Core Lengths, Balboa Marina West

Area	Station	Latitude (°N)	Longitude (°W)	Corrected Depth (ft. MLLW)	Target Length (ft.)	Actual Length (ft.)	
Area A	A-1	33° 36.978	117° 54.271	2.5	6.0	5.0	
	A-2	33° 36.966	117° 54.270	1.0	7.5	6.5	
	A-3	33° 36.956	117° 54.273	4.0	8.5	8.5	
	A-4	33° 36.950	117° 54.274	4.5	8.0	8.0	
	A-5	33° 36.931	117° 54.270	8.3	4.2	4.2	
	A-6	33° 36.939	117° 54.265	6.0	6.5	6.5	
	B-1	33° 36.975	117° 54.259	2.0	6.5	3.5	Sampled by hand auger
Area B	B-1A	33° 36.966	117° 54.258	+5.4	16	16	
	B-2	33° 36.962	117° 54.260	+5.4	11.4	11.4	
	B-3	33° 36.962	117° 54.268	3.0	8.5	6.5	Sampled from water with vibracorer
	B-4	33° 36.951	117° 54.259	+5.4	13.4	13.5	
	B-5	33° 36.944	117° 54.259	+5.4	18.0	12.3	Sampled by hand auger
	B-5A	33° 36.945	117° 54.256	+5.4	18.0	18.0	

### 3.2 PHYSICAL AND CHEMICAL ANALYSIS OF SEDIMENT

Physical and conventional analyses of the composites and the reference sample included grain size determination, total organic carbon (TOC) content, percent total solids, total ammonia and sulfides. Chemical characterizations included metals, organotins, PAHs, chlorinated pesticides, and PCB aroclors. Results of these characterizations are summarized in the following sections. Data reports from the analytical laboratory, including batch-specific QC results, are presented in Appendix C.

Physical characteristics of the composites and the reference sample are shown in Table 11. Based on field observations made during core collection, surface sediments throughout the marine portion of the study area (Stations A1 through A6, B1, and B3) were predominantly comprised of gray, silty sand overlying coarse sand and coarse sand with shell hash. At most locations, silt transitioned to sand approximately 2 to 3 ft. below the sediment surface, with a clear change in grain size present in some cores. Soils collected from the upland portion of the site were quite different in physical appearance being comprised of dry, light-brown coarse sand transitioning to wet, light-grey sand with shell hash at approximately 5 to 7 ft. below ground surface (+1 to +3 ft. MLLW). In upland cores collected from Stations B-2, a band of black sediment with a strong petroleum odor was found at approximately +3.5 to +4 ft. MLLW. This was not observed at other Area B stations, nor was this observed in any of the marine sediments. The elevation of this band of soil was above mudline for any of the marine sediment stations. As indicated in the methods section, material from greater than +5.4 ft MLLW (approximately 2 to 3 ft below ground surface) was not included in the composite sample for analysis.

Sand was the dominant grain size present in both Area composites, with Area A comprised of 79.0% sand and gravel with 8.7% silt and 12.2% clay. The Area B composite was 94.2% sand, with 3.8% silt and 1.9% clay. Total organic carbon was low in both composites, with 0.50% TOC in the Area A composite and 0.23% TOC in the Area B composite.

Sediment from the LA-3 Reference site was dominated by silt (64.9%) and clay (22.4%), with small amounts of sand and gravel (12.8%). TOC content in the LA-3 Reference sediment was 2.07%. Total ammonia and total sulfides were measured in bulk sediment porewater during the initial setup of the benthic tests.

### **Metals**

The test composites and the reference sample were analyzed for the presence of ten different metals (Table 11). Selenium and silver were not detected in any of the samples. All other metals were detected in each of the test composites. With the exception of mercury, all metals were detected in each of the test composites at concentrations which were below those in the LA-3 Reference. All metals concentrations were well below the NOAA Effects Range – Medium (ERM) concentrations (NOAA 1995) with only arsenic and mercury concentrations exceeding the Effects Range – Low (ERL) concentrations. The concentration of mercury in the Area A composite was 0.17 mg/kg, very close to the ERL of 0.15 mg/kg and well below the ERM (0.71 mg/kg). The concentration of mercury in LA-3 Reference sediment was 0.09 mg/kg.

Subsamples from two stations, Stations B-1 and B-3 were also analyzed for metals. Concentrations for all detected metals were below those observed in the LA-3 Reference and, with the exception of arsenic, were below the ERL.

### **Organotins**

Organotin concentrations in both test composites, the LA-3 Reference, and sediment from Stations B-1 and B-3 were either undetected or were detected below the detection limit (J values; Table 11). Concentrations of TBT were below the detection limit.

Table 11. Sediment Conventionals, Metals, and Organotins Analysis in Balboa Marina West Area Composites

Analyte	ERL	ERM	LA-3 Reference	Area A	Area B	Station B-1	Station B-3
<b>Conventionals</b>							
Sand/Gravel (%)	--		12.8	79.0	94.2	NM	NM
Silt (%)	--		64.9	8.7	3.8	NM	NM
Clay (%)	--		22.4	12.2	1.9	NM	NM
TOC (%)	--		2.07	0.51	0.23	0.29	0.36
TVS (%)	--		7.23	1.67	0.62	0.62	1.26
Percent Moisture	--		55.5	24.9	15.8	15.4	21.4
Specific Gravity	--		2.72	2.66	2.69	NM	NM
<b>Metals (mg/kg)</b>							
Ag	8.2	3.7	<0.4 U	0.3 U	0.2 U	0.2 U	0.2 U
As	1.2	70	6.1	3.3	1.9	1.7	2.2
Cd	8.1	9.6	0.7	0.4	0.2	0.1 U	0.2
Cr	34	370	41	12.2	5.8	3.9	7.5
Cu	46.7	270	27	17.4	6.4	6.3	10.6
Hg	0.15	0.71	0.09	0.17	0.03 U	0.03 U	0.06
Ni	20.9	51.6	25	7.9	4.7	2.5	4.5
Pb	NA	218	14.3	10.2	4.1	3.7	6.1
Se	1.0	-	<1 U	0.9 U	0.9 U	0.6 U	0.6 U
Zn	150	410	90	54	122	21	33
<b>Organotins (µg/kg)</b>							
TBT	-	-	3.8 U	3.6 U	2.9 J	3.8 U	3.5 U
DBT	-	-	5.6 U	4.9 J	4.2 J	5.7 U	3.5 J
MBT	-	-	2.4 J	2.3 J	1.9 J	4.0 U	3.4 J

U: Undetected. Actual concentration below reported concentration

J: Reported value is below the limit of detection

<sup>a</sup>--: no value

**Polycyclic Aromatic Hydrocarbons**

PAHs were detected in each of the test composites, the LA-3 reference sample, and the subsamples from Stations 3-1 and 3-3 (Table 12). In each case, the total PAH concentrations were below that of the LA-3 Reference. Total PAHs in all samples were well below the ERL of 4,022  $\mu\text{g}/\text{kg}$ .

**Chlorinated Pesticides**

Each area composite, the reference sample, and the Station B-1 and B-3 subsamples were analyzed for a suite of chlorinated pesticides, including DDT and its analogs, or DDx compounds (Table 13).

With the exception of the DDx compounds, chlorinated pesticides were not detected in the test samples. Total DDT concentrations in the area composites and Station subsamples ranged from 0.0 to 20.0  $\mu\text{g}/\text{kg}$  and were similar to or below those of the LA-3 Reference. In the Area-A composite, the total DDx was 20.0  $\mu\text{g}/\text{kg}$  and was comprised of 4,4-DDE (16  $\mu\text{g}/\text{kg}$ ) and 4,4-DDD (4  $\mu\text{g}/\text{kg}$ ). In the Area B composite, the total DDx concentration was 6.5  $\mu\text{g}/\text{kg}$  and was comprised of 4,4'-DDT (1.6  $\mu\text{g}/\text{kg}$ ) and 4,4-DDE (4.9  $\mu\text{g}/\text{kg}$ ). The concentration of 4,4-DDT in the Area B composite was below the ERL for DDT (2  $\mu\text{g}/\text{kg}$ ). DDx compounds were undetected in the subsamples from Stations 3-1 and 3-3, with the exception of 4,4-DDE (5.0  $\mu\text{g}/\text{kg}$ ) in sediment from Station 3-3.

**PCB Congeners**

Both composites and the reference sample were analyzed for 40 PCB congeners. Total PCB concentrations were well below the ERM in both test composites, with concentrations of 20.0  $\mu\text{g}/\text{kg}$  and 0.0  $\mu\text{g}/\text{kg}$  for Area A and Area B composites, respectively (Table 14). PCBs were undetected or detected near the detection limits in the LA-3 Reference and Stations 3-1 and 3-3 subsamples.

**Pyrethroids**

None of the synthetic pyrethroid compounds were detected in the test composite sediments or reference sample (Table 15).



Table 12. Concentration of PAHs in Balboa Marina West Area Composites

Analyte	ERL	ERM	LA-3 Reference	Area A	Area-B	Sample B-1	Sample B-3
Naphthalene			7.9	4.6 J	10 U	4.9 U	4.9 U
2-Methylnaphthalene			7.1	2.8 J	10 U	4.9 U	4.9 U
1-Methylnaphthalene			3.1 J	4.7 U	10 U	4.9 U	4.9 U
Acenaphthylene			4.8 U	4.7 U	10 U	4.9 U	4.9 U
Acenaphthene	16	500	4.8 U	4.6 J	11	4.9 U	4.9 U
Fluorene	19	540	2.7 J	4.7 U	7.3 J	4.9 U	4.9 U
Phenanthrene	240	1,500	10	4.3 J	10 U	4.9 U	2.5 J
Anthracene	85.3	1,100	3.2 J	4.7 U	10 U	4.9 U	4.9 U
Fluoranthene	600	5,100	23	10	6.4 J	2.7 J	4.9
Pyrene	665	2,600	20	16	6.6 J	3.0 U	6.2
Benzo(a)anthracene	261	1,600	9.0	9.0	10 U	4.9 U	4.3 J
Chrysene	384	2,800	12	6.8	10 U	4.0 J	6.1
Benzo(b)fluoranthene	--	--	10	14	10 U	4.9 U	8.3
Benzo(k)fluoranthene	--	--	5.0	7.9	10 U	4.9 U	5.0
Benzo(a)pyrene	430	1,600	9.6	16	10 U	4.9 U	6.3
Indeno(1,2,3-cd)pyrene	--	--	6.8	8.4	10 U	4.9 U	4.2 J
Dibenz(a,h)anthracene	63.4	260	4.8 U	4.7 U	10 U	4.9 U	4.9 U
Benzo(g,h,i)perylene	--	--	10	11	10 U	4.9 U	5.6
Total PAH	4,022	44,792	139	115	31.3	2.7	53.4

U: Undetected. Actual concentration below reported concentration

J: Reported value is below the limit of detection

<sup>a</sup>--: no value

Table 13. Concentration of Chlorinated Pesticides in Balboa Marina West Area Composites

Analyte (µg/kg)	ERL	ERM	LA-3 Reference	Area A	Area B	Sample B-1	Sample B-3
alpha-BHC	--	--	2.5 U	0.48 U	0.47 U	0.49 U	1.2 Y
beta-BHC	--	--	14 Y	3.6 Y	0.47 U	3.5 Y	4.4 Y
delta-BHC	--	--	2.5 U	0.48 U	0.47 U	0.49 U	0.50 U
Lindane	--	--	2.5 U	0.48 U	0.47 U	0.49 U	0.50 U
Heptachlor	--	--	11 Y	0.48 U	0.47 U	0.49 U	0.50 U
Aldrin	--	--	2.5 U	0.48 U	0.47 U	0.49 U	0.5 U
Heptachlor epoxide	--	--	4.9 U	1.5 Y	0.47 U	0.98 U	0.99 U
Endosulfan I	--	--	2.5 U	0.48 U	0.47 U	0.49 U	0.50 U
Dieldrin	--	--	4.9 U	0.96 U	1.0 U	0.98 U	0.99 U
Endrin	--	--	4.9 U	0.96 U	0.94 U	0.98 U	0.99 U
Endosulfan II	--	--	4.9 U	0.96 U	0.94 U	0.98 U	0.99 U
Endosulfan sulfate	--	--	4.9 U	0.96 U	0.94 U	0.98 U	0.99 U
Methoxychlor	--	--	25 U	4.8 U	4.7 U	4.9 U	5.0 U
Endrin Aldehyde	--	--	4.9 U	0.96 U	0.94 U	0.98 U	0.99 U
trans-Chlordane			2.5 U	0.98 Y	0.67 Y	0.49 U	0.50 U
cis-Chlordane		6	2.5 U	0.48 U	0.47 U	0.49 U	0.50 U
Toxaphene	--	--	490 U	96 U	94 U	24 U	25 U
4,4-DDT	2.2	20	3.4 J	0.96 U	1.6	0.98 U	0.99 U
4,4-DDE	2	27	18	16	4.9	0.98 U	5.0
4,4-DDD	1	7	4.9 U	4.0	0.94 U	0.98 U	0.99 U
2,4-DDT	--	--	4.9 U	0.96 U	0.94 U	0.98 U	0.99 U
2,4-DDE	--	--	4.9 U	2.3 Y	0.94 U	0.98 U	0.99 U
2,4-DDD	--	--	4.9 U	0.96 U	0.94 U	0.98 U	0.99 U
Total DDT	1.58	46.1	<b>18</b>	<b>20</b>	<b>6.5</b>	<b>0.0</b>	<b>5.0</b>

U: Undetected. Actual concentration below reported concentration

J: Reported value is below the limit of detection

<sup>a</sup>--: no value

Table 14. Concentrations of PCB Congeners in Balboa Marina West Area Composites

Analyte (ERM=180 ΣPCBs)	LA-3 Reference	Area A	Area B	Station B-1	Station B-3
8	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
18	0.9 Y	1.4	0.5 U	0.5 U	0.5 U
28/31	1.0 U	1.1	0.5 U	0.5 U	0.8 J
33	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
44	0.5 U	1.0 U	0.5 U	0.5 U	0.3 J
49	0.5 U	1.3	0.5 U	0.5 U	0.5
52	1	1.9	0.5 U	0.5 U	0.9
56	4.2 Y	1.0 U	0.6 Y	0.5 U	0.5 U
60	2.1 Y	0.5 U	0.5 U	0.5 U	0.5 U
66	0.6	0.8	0.5 U	0.5 U	0.9
70	0.7	1	0.5 U	0.5 U	0.3 J
74	0.5 U	0.6	0.5 U	0.5 U	0.5 U
87	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95	1.2 Y	2	0.5 U	0.5 U	1.1
97	0.5 U	0.6	0.5 U	0.5 U	0.3 J
99	0.7	1.1	0.5 U	0.5 U	0.4 J
101	4.2 Y	2.4	0.5 U	0.5 U	0.5 U
105	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
110	0.7	0.8	0.5 U	0.5 U	0.8
118	0.7	1.1 Y	0.5 U	0.5 U	0.6
128	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
132	1.0 Y	1.9 Y	0.5 U	0.5 U	0.5 U
138	0.9	1.8	0.5 U	0.5 U	0.7
141	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
149	0.5 U	1.2	0.5 U	0.5 U	0.7
151	0.5 U	0.5	0.5 U	0.5 U	0.5 U
153	1.0 Y	1.9 Y	0.5 U	0.5 U	0.7
156	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
158	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
170	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
174	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
177	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
180	0.5 U	0.6	0.5 U	0.5 U	0.3 U
183	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
187	0.5 U	0.6	0.5 U	0.5 U	0.5 U
194	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
195	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
201	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
203	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
<b>Total PCBs</b>	<b>3.6</b>	<b>20.7</b>	<b>0.0</b>	<b>0.0</b>	<b>7.0</b>

U: Undetected. Actual concentration below reported concentration

J: Reported value is below the limit of detection

<sup>a</sup>--: no value

Table 15. Concentrations of Pyrethroids in Area Composites, Balboa Marina West Area Composites

Analyte	LA-3 Reference <sup>a</sup>	Area A	Area B
Allethrin	<0.5 U <sup>b</sup>	0.5 U	0.5 U
Bifenthrin	<0.5 U	0.5 U	0.5 U
Cyfluthrin	<0.5 U	0.5 U	0.5 U
Cypermethrin	<0.5 U	0.5 U	0.5 U
Danitol (Fenpropathrin)	<0.5 U	0.5 U	0.5 U
Deltamethrin/Tralomethrin	<0.5 U	0.5 U	0.5 U
Esfenvalerate	<0.5 U	0.5 U	0.5 U
Fenvalerate	<0.5 U	0.5 U	0.5 U
Fluvalinate	<0.5 U	0.5 U	0.5 U
L-Cyhalothrin	<0.5 U	0.5 U	0.5 U
cis/trans Permethrin	<5 U	5 U	5 U
Prallethrin	<5 U	0.5 U	0.5 U
Resmethrin	<0.5 U	5 U	5 U
Sumithrin	<5 U	1 U	1 U
Tetramethrin	<1 U	1 U	1 U

<sup>a</sup>Values for LA-3 are from 2011 sample. LA-3 was not analyzed concurrent to Balboa Marina West samples.

<sup>b</sup>U: undetected. True value below the reporting limit.

### 3.3 RESULTS OF BENTHIC AND WATER-COLUMN BIOASSAYS

This section presents a summary of bioassays conducted in support of the dredged material evaluation for Balboa Marina West. Results for each replicate, all water quality observations, statistical analysis, and bench sheets for each test are provided in Appendix D. Test treatments included in this evaluation were Area A and Area B, as well as the LA-3 Reference.

#### **10-Day Benthic Amphipod Test**

The 10-d amphipod test with *Ampelisca abdita* was initiated on August 20, 2013. A summary of test conditions, test results and water quality observations for the test are presented in Tables 16 to 18. The test was validated by 90% survival in the controls. The LC<sub>50</sub> for the ammonia reference-toxicant test was 27.7 mg/L total ammonia, within the control chart limits (24.3 – 79.5 mg/L), indicating that the test animals were similar in sensitivity to previous populations used at the NewFields laboratory. All water quality parameters remained within the recommended ranges throughout the duration of the test. Porewater ammonia was 4.4 mg/L

and 0.1 mg/L total ammonia in the Area A and Area B treatments, respectively. This was below the project-specific NOEC for ammonia of 16.4 mg/L total ammonia.

Mean percent survival in LA-3 Reference was 90%. Mean percent survival in the test treatments were 88% to 0%, respectively. There were no significant differences in survival between the Area A composite and LA-3 Reference; however, a significant difference was observed for the Area B test composite test treatments and the reference.

The Area B composite was dominated by coarse sediment (94% sand and gravel) which is considered to be at the upper end of the grain size tolerance range for *Ampelisca abdita* (SMARM reference). The potential role of grain size in the amphipod toxicity for the Area B composite was evaluated by retesting the Area B composite with the amphipod *Eohaustorius estuarius*. *Eohaustorius* is a free-burrowing amphipod that is tolerant of coarse grain size sediment, similar to the grain size characteristics of the Area B composite. Survival in the control sediment was 99%; whereas survival in the Area B composite was 0%, confirming the toxicity observed in the tests with *Ampelisca abdita*.

Table 16. Test Condition Summary for *Ampelisca abdita*

Test Conditions: <i>A. abdita</i>		
Supplier	John Brezina	
Date acquired	8/15/2013	
Acclimation/holding time	5 days	
Age class	Adult	
Test type/duration	10-Day Benthic	
Test dates	August 20 – 30, 2013	
Weeks of Holding	5 weeks	
Control Sediment	Tomales Bay, CA (native) sediment	
Test temperature	Recommended: 20 ± 1 °C	Achieved: 19.0 – 20.2 °C
Test Salinity	Recommended: 30 ± 1 ppt	Achieved: 30 - 31 ppt
Test dissolved oxygen	Recommended: > 4.6 mg/L	Achieved: 6.0 – 7.7 mg/L
Test pH	Recommended: 7.8 ± 0.5	Achieved: 7.7 – 8.5
Control performance	Recommended: Control ≤ 10% mortality	Achieved: 10%
Reference performance	Recommended: Reference mortality < 20%	Achieved: 10%
Reference Toxicant LC50	27.7 mg/L total ammonia	
Acceptable Range	24.3 – 79.5 mg/L total ammonia	
Test chamber	1-Liter glass chamber	
Replicates/treatment	5 + 2 surrogates for measuring porewater ammonia levels	
Organisms/replicate	20	
Exposure volume	175 mL sediment/ 950 mL water	
Feeding	None	
Water renewal/Lighting	None/Continuous	
Test Protocol Deviations	None	

Table 17. Survival Summary for the 10-day Benthic Test with *Ampelisca abdita*

Treatment	<i>Ampelisca abdita</i>		<i>Eohaustorius estuarius</i>	
	Mean Percentage Survival	Standard Deviation	Mean Percentage Survival	Standard Deviation
Control	90.0	6.1	99.0	2.2
LA-3 Reference	90.0	3.5	Not Tested	
Area A	88.0	4.5	Not Tested	
Area B	0.0	0.0	0.0	0.0

Table 18. Summary of Water Quality for the 10-day Benthic Test with *Ampelisca abdita*

Treatment	Dissolved Oxygen (mg/L)			Temperature (°C)			pH			Salinity (ppt)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
<i>Ampelisca abdita</i>												
Control	7.5	7.3	7.7	20.0	19.4	20.2	8.0	7.8	8.6	30	30	31
LA-3 Reference	7.4	7.1	7.6	20.0	19.4	20.2	8.0	7.8	8.5	31	31	31
Area A	7.5	7.3	7.7	20.0	19.4	20.2	8.1	7.9	8.5	30	30	30
Area B	7.5	7.4	7.7	20.0	19.4	20.2	8.1	7.9	8.5	30	30	31
<i>Eohaustorius estuarius</i>												
Control	8.1	7.1	8.4	15.0	14.1	15.8	28	28	28	8.0	7.9	8.1
Area B												

### 10-Day Solid-Phase Polychaete Worm Test

The 10-d polychaete worm test with *Neanthes arenaceodentata* was initiated on August 20, 2013. Summaries of test conditions, test results and water quality observations for the test are presented in Tables 19 to 21. The test was validated by 100% survival in the controls. The LC<sub>50</sub> for the ammonia reference-toxicant test was 169 mg/L total ammonia, within the control chart limits (46.3 - 264 mg/L). All water quality parameters were within the target range for the duration of the test. The porewater ammonia concentrations at test initiation were 4.4 mg/L and 0.1 mg/L total ammonia for the Area A and Area B composites, respectively. This was below the project specific NOEC of 124 mg/L total ammonia.

Mean percent survival in LA-3 Reference was 98.0%. Mean percent survival in both treatments was >90%. No significant differences were observed between the test treatments and the LA-3 Reference.

Table 19. Test Condition Summary for *Neanthes arenaceodentata*

<b>Test Conditions: <i>Neanthes arenaceodentata</i></b>		
Supplier	Aquatic Toxicology Support	
Date acquired	8/20/2013	
Acclimation/holding time	<1 day	
Age class	Juvenile	
Test type/duration	10-Day Benthic	
Test dates	August 20 - 30, 2013	
Weeks of Holding	5 weeks	
Control Sediment	Yaquina Bay sediment	
Test temperature	Recommended: 20 ± 1 °C	Achieved: 19.4 – 20.2°C
Test Salinity	Recommended: 30 ± 1 ppt	Achieved: 30 - 31 ppt
Test dissolved oxygen	Recommended: > 4.6 mg/L	Achieved: 7.1 – 7.7 mg/L
Test pH	Recommended: 7.8 ± 0.5	Achieved: 7.8 - 8.6
Control performance	Recommended: Control ≤ 10% mortality	Achieved: 0%
Reference performance	Recommended: Reference mortality < 20%	Achieved: 2%
Reference Toxicant LC50	168.6 mg/L total ammonia	
Acceptable Range	46.3 – 264.7 mg/L total ammonia	
Test Lighting	Continuous	
Test chamber	1-Liter glass chamber	
Replicates/treatment	5 + 2 surrogates for measuring porewater ammonia levels	
Organisms/replicate	10	
Exposure volume	175 mL sediment/ 950 mL water	
Feeding	None	
Water renewal	None	
Test Protocol Deviations	None	

Table 20. Survival Summary for the 10-day Benthic Test with *Neanthes arenaceodentata*

<b>Treatment</b>	<b>Mean Percentage Survival</b>	<b>Standard Deviation</b>
Control	100	0.0
LA-3 Reference	98.0	4.5
Area A	96.0	5.5
Area B	100	0.0

Table 21. Summary of Water Quality, 10-Day Benthic Test with *Neanthes arenaceodentata*

Treatment	Dissolved Oxygen (mg/L)			Temperature (°C)			pH			Salinity (ppt)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	7.5	7.3	7.7	20.0	19.4	20.2	8.0	7.8	8.6	30	30	31
LA-3 Reference	7.4	7.1	7.6	20.0	19.4	20.2	8.0	7.8	8.5	31	31	31
Area A	7.5	7.3	7.7	20.0	19.4	20.2	8.1	7.9	8.5	30	30	30
Area B	7.5	7.4	7.7	20.0	19.4	20.2	8.1	7.9	8.5	30	30	31

### **Results of the Water-Column Test with *Menidia beryllina***

The water-column test with *M. beryllina* was initiated on August 16, 2013. Summaries of test conditions, test results and water quality observations for the test are presented in Tables 22 to 24. The test was validated by 94% survival in the controls. The LC<sub>50</sub> for the ammonia reference-toxicant test was 24.3 mg/L total ammonia, and was inside the control chart limits (3.3 – 48.0 mg/L), indicating that the population of test organisms used in this test were similar in sensitivity to those previously tested at the NewFields laboratory. Water quality parameters were within the target ranges for the water-column fish test. Tests with *Menidia* were conducted at the salinity of the test organisms (25 ppt). Bench sheets, including survival in each of the treatment replicates, are presented in Appendix E.

Mean survival in the 100% SPP for the test treatments exceeded 90% in both cases. There were no significant differences between the 100% SPP treatments and the control for any of the test treatments. There were no calculable LC<sub>50</sub>s for any of the test treatments.



Table 22. Test Condition Summary for *Menidia beryllina*

Test Conditions: <i>M. beryllina</i>		
Supplier	Aquatic BioSystems	
Date acquired	8/15/2013	
Acclimation/holding time	1 day	
Age class	10 days old	
Test dates	August 16 - 20, 2013	
Sediment holding time	4 weeks	
Control water	0.2µm-filtered North Hood Canal sea water	
Test temperature	Recommended: 20 ± 2 °C	Achieved: 19.0 - 20.6°C
Test Salinity	Recommended: ambient ± 2 ppt	Achieved: 25 - 26 ppt
Test dissolved oxygen	Recommended: > 4.6 mg/L	Achieved: 6.4 – 7.7 mg/L
Test pH	Recommended: 7.8 ± 0.5	Achieved: 7.3 - 8.3
Control performance	Recommended: Control ≤ 10% mortality	Achieved: 6%
Reference Toxicant LC50	24.2 mg/L total ammonia	
Acceptable Range	3.3 – 50.0 mg/L total ammonia	
Replicates/treatment	5	
Organisms/replicate	10	
Exposure volume	250 mL	
Feeding	Once at 48 hours	
Water renewal/Lighting	None/16- hours light, 8-hours dark	
Deviations	None	

Table 23. Summary of Results for the Water-column Test with *Menidia beryllina*

Treatment	SPP (%)	Mean Percentage Survival	Standard Deviation	LC <sub>50</sub>
Control	0	98.0	4.5	NA
Area A	10	96.0	5.5	>100%
	50	98.0	4.5	
	100	98.0	4.5	
Area B	10	98.0	4.5	>100%
	50	96.0	5.5	
	100	94.0	5.5	

Table 24. Water Quality Observations for the Water-column Test with *Menidia beryllina*

Treatment	SPP(%)	Dissolved Oxygen (mg/L)			Temperature (°C)			Salinity (ppt)			pH		
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	0	7.1	6.6	7.7	19.8	19.4	20.3	25.2	25	26	7.5	7.3	7.6
Area A	10	7.0	6.4	7.7	19.9	19.3	20.5	25.2	25	26	7.8	7.6	8.1
	50	7.0	6.6	7.7	19.9	19.1	20.4	25.6	25	26	8.0	7.7	8.2
	100	7.0	6.6	7.7	19.9	19.0	20.3	26.0	26	26	8.0	7.8	8.3
Area B	10	7.0	6.6	7.6	20.0	19.4	20.5	25.0	25	25	7.9	7.7	8.1
	50	7.1	6.8	7.6	20.0	19.4	20.5	25.2	25	26	7.9	7.7	8.1
	100	7.1	6.8	7.7	19.9	19.2	20.6	25.0	25	25	7.9	7.6	8.1

#### **Results of the Water-Column Test with *Americamysis bahia***

The water-column test with *A. bahia* was initiated on August 16, 2013. Summaries of test conditions, test results and water quality observations for the test are presented in Tables 25 to 27. The test was validated by 100% survival in the controls. The LC<sub>50</sub> for the ammonia reference-toxicant test was 34.0 mg/L total ammonia, and was inside the control chart limits (11.4 – 64.4 mg/L), indicating that the population of test organisms used in this test were similar in sensitivity to those previously tested at the NewFields laboratory. Water quality parameters were within the target ranges for the water-column mysid test. Bench sheets, including survival in each of the treatment replicates, are presented in Appendix E.

Mean percentage survival in the 100% SPP for each of the test treatments was 100%. There were no significant differences between the 100% SPP treatments and the control for any of the test sediments and there were no calculable LC<sub>50</sub>s for any of the test treatments.

Table 25. Test Condition Summary for *Americamysis bahia*

Test Conditions: <i>Americamysis bahia</i>		
Supplier	Aquatic BioSystems	
Date acquired	8/15/13	
Acclimation/holding time	1 day	
Age class	<5 days old	
Test type/duration	96-hour Water Column	
Test dates	August 16-20, 2013	
Sediment holding time	4 weeks	
Control water	0.2- $\mu$ m-filtered North Hood Canal sea water	
Test temperature	Recommended: 20 $\pm$ 2 $^{\circ}$ C	Achieved: 19.0 – 20.6 $^{\circ}$ C
Test Salinity	Recommended: ambient $\pm$ 2 ppt	Achieved: 25 - 27 ppt
Test dissolved oxygen	Recommended: > 4.6 mg/L	Achieved: 5.5 – 7.7 mg/L
Test pH	Recommended: 7.8 $\pm$ 0.5	Achieved: 7.2 - 8.3
Control performance standard	Recommended: Control $\leq$ 10% mortality	Achieved: 2%
Reference Toxicant LC50	34.0 mg/L total ammonia	
Acceptable Range	11.4 – 64.4 mg/L total ammonia	
Replicates/treatment	5	
Organisms/replicate	10	
Exposure volume	250 mL	
Feeding	Every 12-hours	
Water renewal/Lighting	None / 16-hours light, 8-hours dark	
Deviations	None	

Table 26. Summary of Results for the Water-column Test with *Americamysis bahia*

Treatment	SPP (%)	Mean Percentage Survival	Standard Deviation	LC <sub>50</sub>
Control	0	100	4.5	NA
Area A	10	98.0	4.5	>100%
	50	98.0	4.5	
	100	100	0.0	
Area B	10	100	0.0	>100%
	50	96.0	8.9	
	100	100	0.0	

Table 27. Water Quality for the Water-column Test with *Americamysis bahia*

Treatment	SPP(%)	Dissolved Oxygen (mg/L)			Temperature (°C)			Salinity (ppt)			pH		
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	0	6.7	5.9	7.7	19.8	19.4	20.2	25.4	25.0	26.0	7.5	7.2	7.8
Area A	10	6.9	6.4	7.7	19.9	19.3	20.3	25.6	25.0	26.0	7.8	7.6	8.1
	50	6.8	6.2	7.7	19.9	19.1	20.3	25.8	25.0	26.0	7.9	7.7	8.2
	100	6.9	6.4	7.7	20.0	19.0	20.5	26.0	25.0	27.0	8.0	7.7	8.3
Area B	10	7.0	6.6	7.6	20.0	19.3	20.6	25.4	25.0	26.0	7.9	7.6	8.1
	50	6.7	5.5	7.6	20.0	19.4	20.6	25.2	25.0	26.0	7.8	7.6	8.1
	100	6.9	6.0	7.7	20.0	19.2	20.5	25.2	25.0	26.0	7.8	7.6	8.1

#### **Results of the Water-Column Test with *Mytilus* sp.**

The water-column test with *Mytilus* sp. was initiated on August 7, 2013. Summaries of test conditions, test results and water quality observations for the test are presented in Tables 28 to 30. The test was validated by 97.2% normal survival in the controls. Water quality parameters were within the target limits throughout the test. The EC<sub>50</sub> for the ammonia reference-toxicant test was 4.0 mg/L total ammonia, and was inside the control chart limits (1.0 – 9.6 mg/L), indicating that the population of test organisms used in this test were similar in sensitivity to those previously tested at the NewFields laboratory.

Mean normal survival in the 100% SPP for both test treatments was >90%, with no significant differences between the 100% SPP treatments and the control. There were no calculable EC<sub>50</sub>s for the test treatments.

Table 28. Test Condition Summary for *Mytilus* sp.

Test Conditions: <i>Mytilus</i> sp.		
Supplier	Taylor Shellfish, Shelton WA	
Date acquired	8/7/2013	
Acclimation/holding time	<1 day	
Age class	Gametes from adult broodstock	
Test type/duration	48-hour Water Column	
Test dates	August 7-9, 2011	
Sediment Holding Time	4 weeks	
Control water	0.2µm-filtered North Hood Canal sea water	
Test temperature	Recommended: 16 ± 1 °C	Achieved: 15.0 - 16.6°C
Test Salinity	Recommended: 30 ± 2 ppt	Achieved: 30 - 31 ppt
Test dissolved oxygen	Recommended: > 4.0 mg/L	Achieved: 7.3- 8.2 mg/L
Test pH	Recommended: 7.8 ± 0.5	Achieved: 7.7 - 8.1
Control performance standard	Recommended: Control ≥ 70% normal	Achieved: 97.2%
Reference Toxicant LC50	4.0 mg/L total ammonia	
Acceptable Range	1.0 – 9.6 mg/L total ammonia	
Replicates/treatment	5	
Organisms/replicate	20 to 40 per mL	
Exposure volume	10 mL	
Water renewal/Lighting	None / 16- hours light, 8-hours dark	
Deviations	None	

Table 29. Summary of Results for the Water-column Test with *Mytilus* sp.

Treatment	SPP (%)	Mean Percentage Normal Survival	Standard Deviation	EC <sub>50</sub>
Control	0	97.2	1.7	NA
Area A	1	96.7	1.3	>100%
	10	96.8	1.3	
	50	97.0	0.8	
	100	97.1	0.9	
Area B	1	97.4	1.0	>100%
	10	98.3	0.7	
	50	98.6	0.8	
	100	98.3	0.9	

Table 30. Summary of Water Quality Observations for Larval Test with *Mytilus* sp.

Treatment	SPP(%)	Dissolved Oxygen (mg/L)			Temperature (°C)			pH			Salinity (ppt)		
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	0	7.7	7.5	8.0	15.8	15.0	16.5	7.8	7.7	7.8	30.7	30	31
Area A	1	7.8	7.7	8.1	15.8	15.1	16.6	7.8	7.8	7.8	30.3	30	31
	10	7.9	7.7	8.1	15.7	15.1	16.6	7.8	7.8	7.9	31.0	31	31
	50	7.9	7.6	8.2	15.7	15.1	16.6	7.9	7.9	8.0	31.0	31	31
	100	7.8	7.3	8.2	15.8	15.1	16.6	8.0	8.0	8.1	30.3	30	31
Area B	1	7.9	7.7	8.0	15.7	15.1	16.6	7.8	7.8	7.9	30.7	30	31
	10	7.9	7.7	8.1	15.7	15.1	16.4	7.8	7.8	7.9	31.0	31	31
	50	7.9	7.8	8.1	15.7	15.1	16.4	7.8	7.8	7.8	30.0	30	30
	100	7.9	7.8	8.1	15.8	15.3	16.4	7.8	7.7	7.8	30.0	30	30

### 3.4 BIOACCUMULATION TEST RESULTS

Bioaccumulation tests were initiated on August 27, 2013 using the polychaete worm, *Nephtys caecoides*, and the bent nose clam, *Macoma nasuta*. Summaries of test conditions, test results and water quality observations for the test are presented in Tables 31 to 33. Bench sheets, including survival in each of the treatment replicates, are presented in Appendix E. Mean percent survival in the control treatments was 95.0% for *N. caecoides* and 90.0% for *M. nasuta*. Both species were tested in the same test chambers, therefore only one set of water quality observations are recorded. All water quality parameters were within target ranges for the test.

Mean percentage survival in LA-3 Reference was 96.0% for *N. caecoides* and 94.0% for *M. nasuta*. Mean percentage *M. nasuta* and *N. caecoides* survival in the test treatments exceeded 90% for both composites. Based on the results of the amphipod tests, tissue residue analysis was conducted for the LA-3 Reference and Area A composite, only. Tissues from test organisms exposed to the Area B composite were archived and were not submitted for analysis.

Table 31. Test Condition Summary for *Macoma nasuta* and *Nephtys caecoides*

Test Conditions: <i>Macoma nasuta</i> and <i>Nephtys caecoides</i>		
Supplier	J & G Gunstone provided clams and John Brezina provided worms	
Date acquired	Clams: 8/19/13 Worms: 8/16/13	
Acclimation/holding time	Clams: 8 days Worms: 10 days	
Age class	Adult	
Test type/duration	28-Day Bioaccumulation	
Test dates	8/27/11-8/24/2013	
Control sediment	Native Sediment for <i>Macoma</i>	
Test temperature	Recommended: 14 ± 3 °C	Achieved: 13.6 - 16.9°C
Test Salinity	Recommended: 30 ± 7 ppt	Achieved: 30 - 31 ppt
Test dissolved oxygen	Recommended: > 5.0 mg/L	Achieved: 6.2 – 9.1 mg/L
Test pH	Recommended: 7.8 ± 0.5	Achieved: 7.6 – 8.4
Control performance standard	Recommended: Control ≤ 10% mortality	Achieved: <i>M. nasuta</i> –10% <i>N. caecoides</i> – 5.0%
Test Lighting	16- hours light, 8-hours dark	
Test chamber	10 gallon glass aquarium	
Replicates/treatment	5	
Organisms/replicate	25 clams, 60 worms	
Exposure volume	5 cm of sediment, 30 L seawater	
Feeding	None	
Water renewal	Flow-Through	
Deviations	None	

Table 32. Summary of *Macoma nasuta* and *Nephtys caecoides* Survival 28-d Bioaccumulation Test

Treatment	<i>Nephtys caecoides</i>		<i>Macoma nasuta</i>	
	Mean Percentage Survival	Standard Deviation	Mean Percentage Survival	Standard Deviation
Control	95.0	3.9	90.0	6.7
LA-3 Reference	96.0	2.6	94.0	4.6
Area A	94.0	4.7	98.0	3.6
Area B	95.0	2.2	93.0	3.3

Table 33. Summary of Water Quality for the 28-day Bioaccumulation Test

Treatment	Dissolved Oxygen (mg/L)			Temperature (°C)			Salinity (ppt)			pH			Flow (mL/30 sec)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	7.5	6.3	9.1	15.2	13.6	16.2	30.9	30	31	7.8	7.6	8.4	46	38	56
LA-3 Ref	7.4	6.2	9.1	15.0	14.0	16.9	30.9	30	31	7.9	7.6	8.3	46	38	56
Area A	7.6	6.9	8.9	15.1	14.0	16.0	30.9	30	31	7.9	7.6	8.2	46	38	56

### 3.5 TISSUE CHEMICAL ANALYSIS

Both clam and polychaete worm tissues were analyzed for selected analytes. The analyte list was based on sediment data and was determined in coordination with the DMMT. Tissues from the Area A test treatments and the reference were analyzed for mercury. Laboratory reports for the tissue chemical analysis are presented in Appendix F. The results of the tissue residues analysis for clams and worms are presented in Table 34.

There was no significant difference between the LA-3 Reference and the Area A test composite for mercury in *M. nasuta* and *N. caecoides* tissues. The mean mercury concentrations in clams exposed to Area A sediment and the LA-3 Reference sediment was 0.010 mg/kg and 0.009, respectively. Mercury in the *M. nasuta* background tissue was 0.007 mg/kg. The mean mercury concentration in the worm tissues exposed to Area A sediment and the LA-3 Reference sediment was 0.009 mg/kg and 0.008 mg/kg, respectively. Mercury in the *N. caecoides* background tissue was 0.009 mg/kg. Lipids were measured in clam and worm tissues tested at NewFields. Mean lipid content for *N. caecoides* based on 38 samples tested in Newport Beach was 1.2% and for *M. nasuta*, the mean lipid content was 0.50%.



Table 34. Concentrations of Mercury in Bioaccumulation Test Tissues, Balboa Marina West Proposed Dredge Area

Treatment	Replicate	<i>Macoma nasuta</i>		<i>Nephtys caecoides</i>	
		Mercury (mg/kg)	Mean Mercury Concentration (mg/kg)	Mercury (mg/kg)	Mean Mercury Concentration (mg/kg)
Background	1	--	0.007	--	0.009
LA-3 Reference	1	0.010	0.009	0.008	0.008
	2	0.008		0.008	
	3	0.008		0.009	
	4	0.010		0.008	
	5	0.009		0.009	
Area A	1	0.010	0.012	0.009	0.009
	2	0.013		0.009	
	3	0.012		0.008	
	4	0.012		0.009	
	5	0.013		0.009	

\*Result is statistically greater than reference.

#### 4. DISCUSSION

Sediment from two study areas within the Balboa Marina West proposed expansion footprint in Newport Beach, California were evaluated for the proposed dredged material disposal. The suitability of the proposed dredged material was evaluated using physical, chemical, and biological characterizations of sediment samples based upon criteria outlined in the Ocean Testing Manual (OTM; USEPA/USACE 1991). Potential nearshore reuse was also evaluated following guidance provided in the Inland Testing Manual (ITM; USEPA/USACE 1991). Suitability, as determined by the OTM/ITM, is based on the toxicological responses of test organisms exposed to dredged material during removal, disposal through the water column, and bedding of sediment that has been placed at the disposal site. Additionally, the potential for bioaccumulation of contaminants by organisms at the disposal site are addressed using 28-d bioaccumulation tests. Tissue residues from the bioaccumulation test are compared to the tissues exposed to reference sediments as well as to consensus guidance from a number of different sources including the Food and Drug Administration (FDA), the Environmental Residue Effects Database (ERED), and supplemental USEPA guidance historically used in ocean disposal sites. The results for each study area are discussed below in light of the interpretive criteria provided by the OTM and ITM.

##### 4.2 SEDIMENT SAMPLING AND SEDIMENT CHEMISTRY

Sediment was collected from a total of 13 stations within the project area. Stations A1 through A6 and Station B15 represented the marine portion of the site. Stations B1a through B5a represented the nearshore portion of the site. All stations were located within the pierhead

line. Sediments in the marine portion of the site were generally characterized as silty sand with an underlying layer of coarse sand and shellhash. The composites were characterized as sand, with 79% and 94% sand in the Area A and Area B composites, respectively. TOC was <1% for the A and B composites.

With the exception of mercury, all metals were either undetected or detected at concentrations which were below those in the LA-3 Reference. All metals concentrations were well below the NOAA Effects Range – Medium (ERM) concentrations (NOAA 1995) with only arsenic and mercury concentrations exceeding the Effects Range – Low (ERL) concentrations. The concentration of mercury in the Area A composite was 0.17 mg/kg, very close to the ERL of 0.15 mg/kg and well below the ERM (0.71 mg/kg). The concentration of mercury in LA-3 Reference sediment was 0.09 mg/kg. Concentrations for all detected metals in Samples B-1 and B-3 were below those observed in the LA-3 Reference and, with the exception of arsenic, were below the ERL.

The concentrations of organotins in both area composites were below the detection limit. Concentrations of total PAHs in the two area composites and Stations B-1 and B-3 ranged from 2.7 to 115 µg/kg and were all below total PAHs in the LA-3 Reference (139 µg/kg) and were well below the ERL (4,022 µg/kg). PCB congeners were either undetected or detected at concentrations near the detection limit. Total PCB concentrations in the test composites and B-1 and B-3 sub-samples ranged from 0.0 and 20.7 µg/kg. Pyrethroids were not detected in either of the test composites.

With the exception of the DDx compounds, chlorinated pesticides were not detected in the test composites or station subsamples. The total DDT concentrations in the test composites and station subsamples ranged from 0.0 to 20 µg/kg total DDT and were similar to or below the concentration observed in the LA-3 Reference of 18 µg/kg.

### 4.3 BENTHIC TEST SUMMARY

Benthic tests were conducted with the amphipod, *Ampelisca abdita*, and the marine worm, *Neanthes arenaceodentata*. *Ampelisca* is one of the OTM/ITM recommended amphipod species and is well suited for evaluating the potential effects of contaminants in the clay-rich sediments of Lower Newport Bay. The worm, *Neanthes arenaceodentata*, is a commonly used species in benthic tests throughout the West coast. While previous sediment programs in Newport Beach have often used the mysid solid phase test, the benthic worm test is considered to be a more sensitive indicator of toxicity.

The OTM and ITM define biologically significant toxicity for the benthic tests as follows:

- Amphipod: a statistically significant decrease in survival relative to the reference and that is >20% lower than that of the reference.
- Worm: a statistically significant decrease in survival relative to the reference and that is >10% lower than that of the reference.

Mean survival of amphipods and polychaete worms in the Area A test composite were not statistically lower than those exposed to the LA-3 Reference sediment and no biologically significant toxicity was observed. However, 100% mortality was observed in the amphipod test with the Area B composite. Table 35 provides a summary of the benthic tests relative to the OTM/ITM criteria. The Area A test composite met the benthic evaluation criteria in the OTM/ITM; however, the Area B test composite did not meet the benthic evaluation criteria for the amphipod test.

Table 35. Evaluation Criteria Comparison for Benthic Tests

Treatment	Amphipod ( <i>Ampelisca abdita</i> )			Worm ( <i>Neanthes arenaceodentata</i> )		
	Mean Survival (%)	Statistically less than LA-3 Reference	Survival >20% Less than LA-3 Reference	Mean Survival (%)	Statistically less than LA-3 Reference	Survival >10% Less than LA-3 Reference
Control	90	--	--	100	--	--
LA-3 Reference	90	--	--	98	--	--
Area A	88	No	No	96	No	No
Area B	0	Yes	Yes	100	No	No

#### 4.4 WATER-COLUMN SUMMARY

No significant toxicity was observed in the water column tests with *M. beryllina*, *A. bahia*, or larval *Mytilus* sp. All test concentrations had greater than >90% survival, and no statistically significant differences were observed in the 100% elutriate samples when compared to the control survival. The calculated LC<sub>50</sub>/EC<sub>50</sub> for all test composites was >100% SPP.

For sediment to be considered suitable for aquatic disposal the mean percentage survival or normality in the 100% SPP concentrations must not be statistically significantly different than the 0% SPP treatment or the modeled concentration at the edge of the disposal site must not exceed Limiting Permissible Concentration (LPC).

Each of the test treatments were below the LPC based on the lack of significant toxicity in any of the 100% SPP treatments.

#### 4.5 BIOACCUMULATION TEST

The 28-day bioaccumulation tests were conducted to evaluate the potential for contaminants in the Lower Newport Bay sediments to be taken into tissues of benthic organisms at the disposal site. The bioaccumulation test was conducted with *Macoma nasuta* and *Nephtys caecoides*, two species commonly used on the West Coast to evaluate bioaccumulation potential. Survival in all treatments was adequate to provide sufficient tissue for all chemical

analysis. Because the Area B test composite did not meet the OTM/ITM criteria for the amphipod test, tissues were not analyzed for bioaccumulable contaminants of concern for this treatments. Based on sediment chemistry, tissues were analyzed for mercury in tissues exposed to the LA-3 Reference and Area A composite sediments.

As indicated in the OTM/ITM, the statistical comparison of tissue residues in the treatments to the reference provides a starting point to the tiered evaluation. Because variability between replicates in the reference tissues is typically low, a statistical significance may be observed without biological relevance. In this case, other points of comparison and interpretation are used, including: an evaluation of the magnitude of difference, a comparison of observed tissue residues with critical body residue levels, and site-specific factors that help to predict effects at the disposal site. These points of evaluation will be discussed in the following sections.

### **Mercury**

Mercury concentrations in polychaete worm and clam tissues were similar to those of the reference and background tissues. No significant differences were observed in the tissues exposed to test treatments when compared to those of the LA-3 Reference, indicating that there was no significant uptake of mercury by *N. caecoides* or *M. nasuta* exposed to any of the test treatments.

## **4.6 SUITABILITY EVALUATION**

Based on the OTM/ITM suitability criteria, sediments from that portion of the site represented by Area A would be considered to be suitable for ocean disposal. The high proportion of sand in these sediments would also indicate that they may be acceptable for nearshore placement/replenishment. Due to the results of the amphipod test, the upland soils/sediments represented by the Area B composite would not be considered suitable for placement at the LA-3 disposal site or nearshore placement.

Station B-3 was part of the Area B composite, however, based on the characteristics of the Station B-3 sediment, it is more similar to those sediments comprising the Area A composite than the Area B composite. It is marine in nature and analytical chemistry indicated an absence of priority pollutants. Based on these observations and discussions with the DMMT, those marine sediments beyond the current rip-rap line and cement revetment would be considered suitable for ocean disposal (Figure 7). This represents an estimated 4,000 CY, with an estimated 1,230 CY per foot of overdredge.

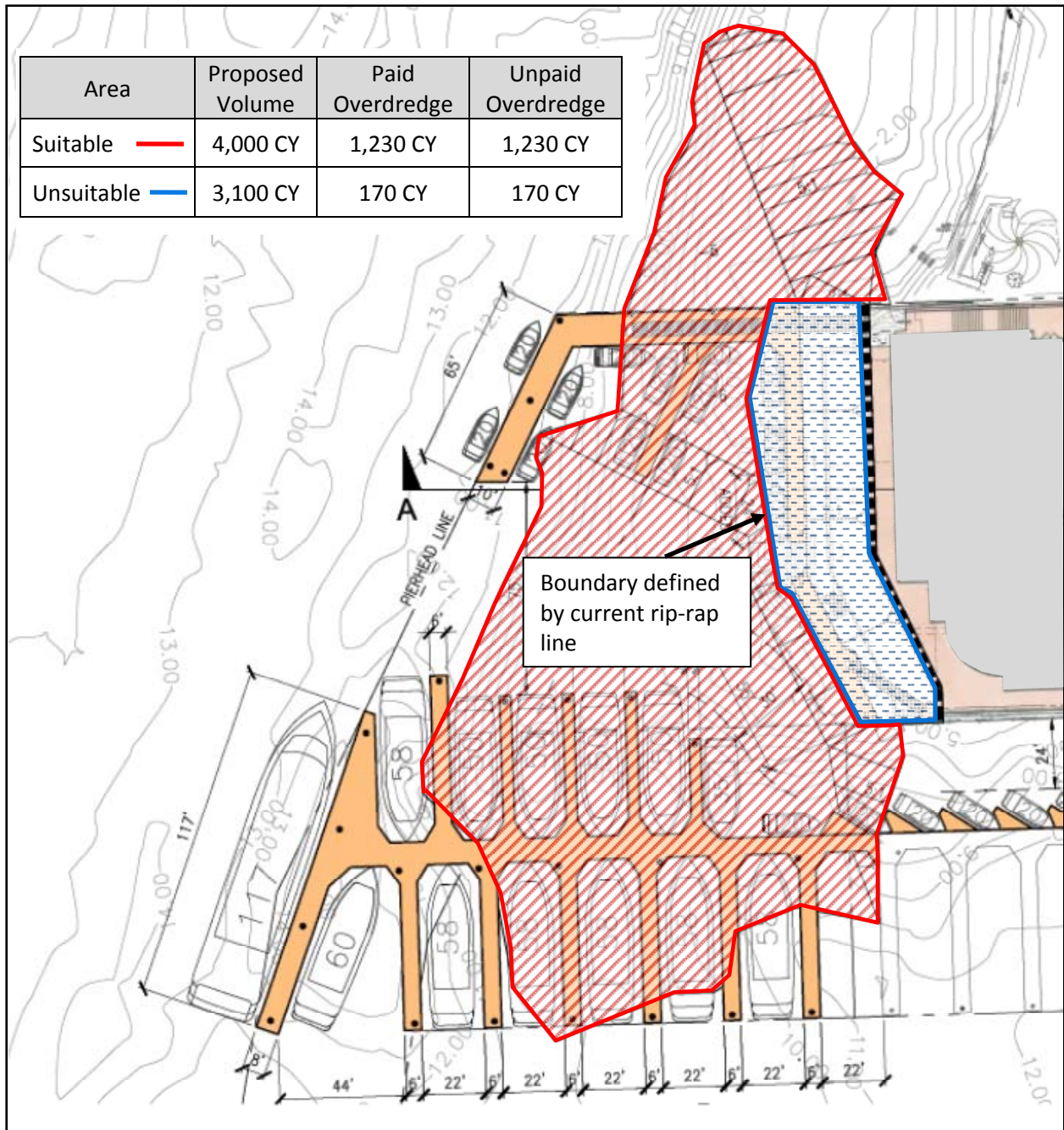


Figure 7. Project plan, proposed dredging footprint and current bathymetry of site.

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## **Appendix A**

### ***Balboa Marina West Sediment Evaluation***

#### **Core Logs**



# NewFields

# Core Log

PROJECT/SURVEY <b>BBW</b> <i>Balboa Marine West</i>		DATE <b>7-18-13</b>	PROJECT MANAGER <b>BBW</b> <i>(circled)</i>	RECORDER <b>BBW</b>		
STATION ID <b>A-1</b>		NAV DATUM <b>WGS 84</b>	LATITUDE <b>36.9078</b>	LONGITUDE <b>54.2706</b>		
ATTEMPT <b>1</b>	TIME STARTED <b>1918</b>	TIME FINISHED <b>1925</b>	WATER DEPTH (FT) <b>P.O</b>	TIDE (FT) <b>5.7</b>		
MLLW (FT) = WATER DEPTH - TIDE <b>2.5</b>		SAP DEPTH (FT) <b>8.5</b>	SAP DEPTH - MLLW <del>2.5</del>	TARGET CORE LENGTH (FT) <b>6.0</b>		
FINAL CORE LENGTH (FT) <b>5.0</b>		CORE DIAMETER (IN)	START TAPE (FT)			
FINISH TAPE (FT)		PENETRATION (FT) = FINISH - START <b>7.0</b>		RECOVERY		
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	<i>Silty Sand w/ hash</i>	<i>No</i>	<i>Dark gray</i>		
2	2					
3	3	<i>Coarse Sand</i>	<i>No</i>	<i>light gray</i>		<i>w/ shell hash</i>
4	4					
5	5	<i>Coarse sand</i>	<i>No</i>	<i>light gray</i>		<i>2-layer w/shell hash</i>
6	6					
7	7					
8	8					
9	9					
10	10					

0  
|  
2.3  
|  
5.0  
|  
5.5

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PROJECT/SURVEY			DATE	PROJECT MANAGER	RECORDER	
STATION ID			NAV DATUM	LATITUDE	LONGITUDE	
ATTEMPT	TIME STARTED	TIME FINISHED	WATER DEPTH (FT)	TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE	
SAP DEPTH (FT)	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT)	FINAL CORE LENGTH (FT)	CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	silty sand shell			↑	
2	2	T	none		A-2	
3	3	shell w/ silt		gray		
4	4	+				
5	5	coarse sand		light		
6	6	coarse sand		gray	A-2 layer	
7	7					
8	8					
9	9					
10	10					

NOTES

very heavy shell layer - nearly all shell w/ some silt

PROJECT/SURVEY <i>Balboa West</i>			DATE <i>7/18/13</i>	PROJECT MANAGER <i>Bob</i>	RECORDER <i>Bob</i>	
STATION ID <i>A-3</i>			NAV DATUM <b>WGS 84</b>	LATITUDE <i>36.9557</i>	LONGITUDE <i>84.2731</i>	
ATTEMPT <i>1</i>	TIME STARTED <i>1505</i>	TIME FINISHED <i>1516</i>	WATER DEPTH (FT) <i>8.0</i>	TIDE (FT) <i>4.0</i>	MLLW (FT) = WATER DEPTH - TIDE <i>4.0</i>	
SAP DEPTH (FT) <i>12.5</i>	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) <i>8.5</i>	FINAL CORE LENGTH (FT) <i>8.5</i>	CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	<i>silty</i>				
2	2	<i>sand</i>				
3	3	<i>sand</i>				
4	4	<i>silty sand</i> <del><i>shell hash</i></del>	<i>none</i>			
5	5	<i>silty</i>		<i>gray</i>		
6	6	<i>sand</i>				
7	7	<hr/>		<i>light gray</i>		
8	8	<i>sand</i>				
9	9	<hr/>				
10	10					

NOTES

*Shell hash layer @ 8' - vibrocore holds @ that layer and skip penetrates*

PROJECT/SURVEY <b>A-4</b>			DATE <b>7.18.13</b>	PROJECT MANAGER <b>BWTG</b>	RECORDER <b>BWTG</b>	
STATION ID <b>Balboa West</b>			NAV DATUM <b>WGS 84</b>	LATITUDE <b>36° 9497</b>	LONGITUDE <b>54° 2740</b>	
ATTEMPT <b>1</b>	TIME STARTED <b>1357</b>	TIME FINISHED <b>1403</b>	WATER DEPTH (FT) <del>7.5</del> <b>7.0</b>	TIDE (FT) <b>3.0</b>	MLLW (FT) = WATER DEPTH - TIDE <b>4.5</b>	
SAP DEPTH (FT) <b>12.5</b>	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) <b>8.0</b>	FINAL CORE LENGTH (FT) <b>8.0</b>	CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START <b>9.0</b>			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	firm		dark brown		
2	2	silty sand		dark gray		
3	3					
4	4	silty sand	none	gray		
5	5	<del>sand</del>				shell
6	6					
7	7	sand		light gray		
8	8	some w/ shell				2-layer
9	9					
10	10					

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PROJECT/SURVEY <i>Balboa West</i>			DATE <i>7/18/13</i>	PROJECT MANAGER <i>BW6</i>	RECORDER <i>BW6</i>	
STATION ID <i>A-5</i>			NAV DATUM <i>WGS 84</i>	LATITUDE <i>33° 36.9358</i>	LONGITUDE <i>117° 54.2703</i>	
ATTEMPT <i>1</i>	TIME STARTED <i>1.25</i>	TIME FINISHED	WATER DEPTH (FT) <i>11.0</i>	TIDE (FT) <i>2.7</i>	MLLW (FT) = WATER DEPTH - TIDE <i>8.3</i>	
SAP DEPTH (FT) <i>12.5</i>	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) <i>4.2</i>	FINAL CORE LENGTH (FT) <del><i>4.2</i></del>	CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)		PENETRATION (FT) = FINISH - START		RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1					
2	2					
3	3					
4	4					
5	5					
6	6					
7	7					
8	8					
9	9					
10	10					

NOTES

*but refusal - hard object below - dents in end of tube*

*moved station in from channel which appears to have been dredged.*

PROJECT/SURVEY <i>Balboa West</i>			DATE <i>7/18/13</i>	PROJECT MANAGER <i>bwz</i>	RECORDER <i>bwz</i>	
STATION ID <i>A-5</i>			NAV DATUM <i>WGS 84</i>	LATITUDE <i>36.9308</i>	LONGITUDE <i>122.2700</i> <del><i>54.2696</i></del>	
ATTEMPT <i>2</i>	TIME STARTED <i>10:39</i> <del><i>9:46</i></del>	TIME FINISHED <i>1042</i>	WATER DEPTH (FT) <i>10.5</i>	TIDE (FT) <i>2.5</i> <del><i>2.2</i></del>	MLLW (FT) = WATER DEPTH - TIDE <i>8.3</i>	
SAP DEPTH (FT) <i>12.5</i>	SAP DEPTH - MLLW	TARGET CORE LENGTH (FT) <i>3.4.2</i>	FINAL CORE LENGTH (FT) <i>4.2</i>	CORE DIAMETER (IN) <i>4</i>		
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START <i>5.5</i>			RECOVERY <i>4.2'</i>	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
<i>1</i>	<i>1</i>	<i>silt</i>	<i>↑</i>	<i>olive brown</i>	<i>↑</i>	
<i>2</i>	<i>2</i>	<i>silty sand</i>	<i>none</i>	<i>light gray</i>	<i>AS</i>	
<i>3</i>	<i>3</i>	<i>↓</i>	<i>↓</i>	<i>light gray</i>	<i>↓</i>	
<i>4</i>	<i>4</i>	<i>silty sand shell hsh</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>5</i>	<i>5</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>2 layer A-5</i>	
<i>6</i>	<i>6</i>					
<i>7</i>	<i>7</i>					
<i>8</i>	<i>8</i>					
<i>9</i>	<i>9</i>					
<i>10</i>	<i>10</i>					

NOTES

*incline 5.5'*

*bottom layer coarser (bottom 6")*

PROJECT/SURVEY <i>Baldoa West</i>			DATE <i>7-18-13</i>	PROJECT MANAGER <i>Boz</i>	RECORDER <i>BWD</i>	
STATION ID <i>A-6</i>			NAV DATUM <i>WGS 84</i>	LATITUDE <i>36.9390</i>	LONGITUDE <i>54.2646</i>	
ATTEMPT	TIME STARTED <i>1145</i>	TIME FINISHED <i>1149</i>	WATER DEPTH (FT) <i>8.0</i>	TIDE (FT) <i>2.0</i>	MLLW (FT) = WATER DEPTH - TIDE <i>6.0</i>	
SAP DEPTH (FT) <i>12.5</i>	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) <i>6.5</i>	FINAL CORE LENGTH (FT) <i>7.0</i>	CORE DIAMETER (IN) <i>4.0</i>	
START TAPE (FT)	FINISH TAPE (FT)		PENETRATION (FT) = FINISH - START		RECOVERY <i>7.0</i>	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	<i>silt</i>		<i>olive gray</i>		
2	2	<i>hash</i>				
3		<i>* Sand</i>	<i>none</i>		<i>A-6</i>	
4	4	<i>+</i>				
5	5	<i>coarse Sand</i>		<i>light gray</i>		
6	6	<i>Sand</i>		<i>gray</i>		
7	7	<i>Shell hash</i>			<i>Shell hash</i>	<i>2</i>
8	8				<i>below</i>	<i>2</i>
9	9					
10	10					

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PROJECT/SURVEY <i>B-1a (puzel)</i>		DATE <i>7/19/13</i>		PROJECT MANAGER <i>BWS</i>		RECORDER <i>BWSC</i>	
STATION ID		NAV DATUM <b>WGS 84</b>		LATITUDE <i>33° 36.968</i>		LONGITUDE <i>117° 54.258</i>	
ATTEMPT <i>1</i>	TIME STARTED <i>1050</i>	TIME FINISHED <i>1059</i>	WATER DEPTH (FT)	TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE		
SAP DEPTH (FT)	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) <i>18'</i>	FINAL CORE LENGTH (FT) <i>18'</i>		CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)		PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH		MISC
<i>1</i>	<i>1</i>	<i>asphalt fill sand</i>			<i>B-1a</i>		
<i>2</i>	<i>2</i>	<i>sand</i>	<i>none</i>	<i>tan</i>			
<i>3</i>	<i>3</i>	<i>dry</i>					
<i>4</i>	<i>4</i>			<i>Brown</i>			
<i>5</i>	<i>5</i>						
<i>6</i>	<i>6</i>						
<i>7</i>	<i>7</i>	<i>dark silty sand</i>					
<i>8</i>	<i>8</i>	<i>wet</i>		<i>grey</i>			
<i>9</i>	<i>9</i>			<i>dark grey</i>			
<i>10</i>	<i>10</i>						

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PROJECT/SURVEY <i>Bla (page 2)</i>		DATE		PROJECT MANAGER		RECORDER	
STATION ID		NAV DATUM <b>WGS 84</b>		LATITUDE		LONGITUDE	
ATTEMPT	TIME STARTED	TIME FINISHED	WATER DEPTH (FT)	TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE		
SAP DEPTH (FT)	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT)	FINAL CORE LENGTH (FT)		CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)		PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH		MISC
11	11	<i>silty</i>	<i>none</i>	<i>dark</i>	<i>Bla</i>		
12	12	<i>sand w/ shell</i>		<i>grey</i>			
13	13						
14	14	<i>wet</i>					
15	15						
<del>16</del> <i>18</i>	<del>16</del> <i>18</i>				<i>Bla</i>		
7	7						
8	8						
9	9						
10	10						

NOTES

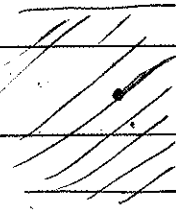
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PROJECT/SURVEY <b>B2 (P1)</b>			DATE <b>10.19.13</b>	PROJECT MANAGER <b>BWG</b>	RECORDER <b>BWG</b>	
STATION ID			NAV DATUM <b>WGS 84</b>	LATITUDE <b>38° 36.962</b>	LONGITUDE <b>117° 54.260</b>	
ATTEMPT	TIME STARTED	TIME FINISHED	WATER DEPTH (FT)	TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE	
SAP DEPTH (FT)	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) <b>11.5</b>	FINAL CORE LENGTH (FT) <b>11.5</b>	CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	Asphalt fill sand	none		X	
2	2	dry sand	↓	tan/brown		
3	3	↓	↓			
4	4	↓	↓			
5	5	↓	↓			
6	6	met sand		<del>brown</del>	B-2	petroleum odor, dark soil
7	7	↓	↓			
8	8	↓	↓	brown/grey		
9	9	↓	↓	transition		
10	10	↓	↓		↓	

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PROJECT/SURVEY <i>B-2 cont'd (p.2)</i>			DATE		PROJECT MANAGER		RECORDER	
STATION ID			NAV DATUM <b>WGS 84</b>		LATITUDE		LONGITUDE	
ATTEMPT	TIME STARTED	TIME FINISHED	WATER DEPTH (FT)		TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE		
SAP DEPTH (FT)	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT)		FINAL CORE LENGTH (FT)		CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)		PENETRATION (FT) = FINISH - START				RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH		MISC	
11	1	<i>Sand</i>	<i>None</i>	<i>grey</i>	1			
12	2				B-2			
13	3	<i>Some shell</i>						
14	4	<i>None</i>						
15	5							
16	6							
17	7							
8	8							
9	9							
10	10							

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PROJECT/SURVEY <i>Balboa Marina West</i>			DATE <i>7/10/13</i>	PROJECT MANAGER <i>B. Gardiner</i>	RECORDER <i>C. Ray</i>	
STATION ID <i>B4</i>			NAV DATUM <b>WGS 84</b>	LATITUDE <i>33° 36.951'</i>	LONGITUDE <i>117° 54.259'</i>	
ATTEMPT <i>2</i>	TIME STARTED <i>1401</i>	TIME FINISHED <i>1419</i>	WATER DEPTH (FT)	TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE	
SAP DEPTH (FT)	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) <i>13.4</i>	FINAL CORE LENGTH (FT) <i>14</i>	CORE DIAMETER (IN)	
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
<i>11</i>	<i>1</i>	<i>silty sand</i>	<i>none</i>	<i>grey</i>	↓	
<i>12</i>	<i>2</i>	↓	↓	↓		
<i>13</i>	<i>3</i>	↓	↓	↓		
<i>14</i>	<i>4</i>	↓	↓	↓		
<i>15</i>	<i>5</i>					
<i>16</i>	<i>6</i>					
<i>17</i>	<i>7</i>					
<i>18</i>	<i>8</i>					
<i>19</i>	<i>9</i>					
<i>20</i>	<i>10</i>					

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PROJECT/SURVEY <i>Balboa Marina West</i>			DATE <i>7/10/13</i>	PROJECT MANAGER	RECORDER <i>Chan</i>	
STATION ID <i>B5a</i>			NAV DATUM <i>WGS 84</i>	LATITUDE	LONGITUDE	
ATTEMPT <i>4</i>	TIME STARTED <i>1208</i>	TIME FINISHED <i>1235</i>	WATER DEPTH (FT) <i>-</i>	TIDE (FT) <i>-</i>	MLLW (FT) = WATER DEPTH - TIDE <i>+8.5</i>	
SAP DEPTH (FT)	SAP DEPTH - MLLW	TARGET CORE LENGTH (FT) <i>18</i>	FINAL CORE LENGTH (FT) <i>18</i>	CORE DIAMETER (IN) <i>2"</i>		
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
<i>1</i>	<i>1</i>	<i>dry sand</i>	<i>none</i> <del><i>Brown</i></del>	<i>tan/brown</i>	<i>X</i>	<i>asphalt + fill (not included)</i>
<i>2</i>	<i>2</i>	↓	↓	<i>olive/brown</i>		↓
<i>3</i>	<i>3</i>	↓	↓	↓		↓
<i>4</i>	<i>4</i>	↓	↓	↓		↓
<i>5</i>	<i>5</i>	↓	↓	↓		↓
<i>6</i>	<i>6</i>	<i>moist sand</i>	<i>none</i>	<i>grey/brown</i>	<i>T</i> <i>B-5a</i>	
<i>7</i>	<i>7</i>	↓	↓	<i>grey</i>		↓
<i>8</i>	<i>8</i>	<i>silty sand</i>	↓	↓		↓
<i>9</i>	<i>9</i>	<i>shell hash</i>	↓	↓		↓
<i>10</i>	<i>10</i>	↓	↓	↓		↓

NOTES  
*photos 320-330*

PROJECT/SURVEY <i>Balboa Marina West</i>			DATE <i>7/10/13</i>	PROJECT MANAGER <i>B. Gardner</i>	RECORDER <i>C-Ray</i>	
STATION ID <i>BSa</i>			NAV DATUM <i>WGS 84</i>	LATITUDE	LONGITUDE	
ATTEMPT <i>4</i>	TIME STARTED <i>1208</i>	TIME FINISHED <i>1235</i>	WATER DEPTH (FT) <i>—</i>	TIDE (FT) <i>—</i>	MLLW (FT) = WATER DEPTH - TIDE	
SAP DEPTH (FT)	SAP DEPTH - MLLW	TARGET CORE LENGTH (FT) <i>18</i>	FINAL CORE LENGTH (FT) <i>18</i>	CORE DIAMETER (IN) <i>2"</i>		
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
<i>1</i>	<i>1</i>	<i>Sand w/ shell</i>	<i>none</i>	<i>grey</i>	<i>1</i>	
<i>2</i>	<i>2</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>3</i>	<i>3</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>4</i>	<i>4</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>5</i>	<i>5</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>6</i>	<i>6</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>7</i>	<i>7</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>8</i>	<i>8</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>9</i>	<i>9</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	
<i>10</i>	<i>10</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	

NOTES

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PROJECT/SURVEY Balboa Marina West			DATE 7/10/13	PROJECT MANAGER B. Gardiner	RECORDER C. Ray	
STATION ID B5			NAV DATUM WGS 84	LATITUDE 33° 36.944'	LONGITUDE 117° 54.259'	
ATTEMPT 1	TIME STARTED 0928	TIME FINISHED 0947	WATER DEPTH (FT)	TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE	
SAP DEPTH (FT)	SAP DEPTH - MLLW		TARGET CORE LENGTH (FT) 18	FINAL CORE LENGTH (FT) 3	CORE DIAMETER (IN) 4	
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP.(FT)	RETRV. DEP.(FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	fine sand w/silt		orange brown	no sample taken	
2	2	and woody material				
3	3					white pvc pipe pieces
4	4	Refusal				
5	5					
6	6					
7	7					
8	8					
9	9					
10	10					

NOTES  
photos 13-18 291-296



PROJECT/SURVEY Balboa Marina West			DATE 7/10/13	PROJECT MANAGER B. Gardner	RECORDER C. Ray	
STATION ID BS			NAV DATUM WGS 84	LATITUDE 33° 36.944'	LONGITUDE 117° 54.259'	
ATTEMPT 2	TIME STARTED 0958	TIME FINISHED 1020	WATER DEPTH (FT)	TIDE (FT)	MLLW (FT) = WATER DEPTH - TIDE	
SAP DEPTH (FT)	SAP DEPTH - MLLW	TARGET CORE LENGTH (FT) 18	FINAL CORE LENGTH (FT) 7.25	CORE DIAMETER (IN) 4		
START TAPE (FT)	FINISH TAPE (FT)	PENETRATION (FT) = FINISH - START			RECOVERY	
PEN. DEP. (FT)	RETR. DEP. (FT)	SEDIMENT TYPE	ODOR	COLOR (CHROMA/VALUE/HUE)	SAMPLE ID BY DEPTH	MISC
1	1	fine sand w/silt and woody material		orange brown	BS top	
2	2	↓				
3	3			light brown		
4	4					
5	5		med sand less organic material some shell hash, wet sediment			gray brown
6	6					
7	7					
8	8					
9	9					
10	10					

NOTES  
 19-21 photos of top layer - 297-299  
 22-30 photos of BS - 300-308  
 unable to continue coring - hole caved in

## **Appendix B**

### ***Balboa Marina West Sediment Evaluation***

#### **Core Photos**



+5.4' MLLW



0' MLLW



Station B-2



-3.0' MLLW

-9.5' MLLW

Station B-3



-1.0' MLLW

-8.5' MLLW

Station A-3



Station A-1



Station A-2 0-3'



Station A-2 3-6'



Station A-4 0-2'



Station A-4 3-5'



Station A-4 5-7'



Station A-5 0-2'



Station A-5 2-5'



Station A-6 0-3'



Station A-6 3-5'



Station A-6 4-6'





Station B-4 0-3'



Station B-4 2-4'



Station B-4 4-6'



Station B-4 5-6'



Station B-4 7-9'



Station B-4 9-10'



Station B-4 10-12'



Station B-4 12-14'



Station B-5a 0-3'



Station B-5a 3-4'



Station B-5a 3-5'



Station B-5a 5-7'



Station B-5a 6-8.5'



Station B-5a 8.5 - 10.5'



Station B-5a 10.5-12'



Station B-5a 11-13'



Station B-5a 17-18'

## **Appendix C**

### ***Balboa Marina West Sediment Evaluation***

#### **Sediment Chemistry**









**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

August 20, 2013

Bill Gardiner  
Newfields Northwest  
4729 NE View Drive  
Port Gamble, WA 98364

**RE: Client Project: Balboa Marina, 860.0100.000**  
**ARI Job No.: WZ47**

Dear Bill:

Please find enclosed the Chain-of-Custody record (COC), sample receipt documentation, and the final data package for samples from the project referenced above.

Sample receipt and details of the analyses are discussed in the Case Narrative.

An electronic copy of this data and associated raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

*Cherone Oreiro* for  
Cherone Oreiro  
Project Manager  
(206) 695-6214  
[cheroneo@arilabs.com](mailto:cheroneo@arilabs.com)  
[www.ariblas.com](http://www.ariblas.com)

cc: eFile WZ47

Enclosures

**Chain of Custody Documentation**

**ARI Job ID: WZ47**

# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: **wj2v17**  
 Turn-around Requested: **NA**  
 ARI Client Company: **NewFields** Phone: **360.297.6040**  
 Client Contact: **Bill Gardiner**  
 Client Project Name: **Balboa Marina**  
 Client Project #: **860.0100.000** Samplers: **JW, CR**



Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)

Page: \_\_\_\_\_ of \_\_\_\_\_  
 Date: **7/31/13** Ice Present? **y**  
 No. of Coolers: **1** Cooler Temps: **2.6**

Sample ID	Date	Time	Matrix	No Containers	Analysis Requested						Notes/Comments	
					Gran size	Specific Gravity	Toc/TS	Metals	Pst/PCB	TBT/PAH		
LA. 3	7/30/13	1212	Sed.	1	X	X	X	X				
LA. 3	7/30/13	1212		2	X	X	X	X				
Area A Camp	7/30/13	1050		1	X	X	X	X				
Area A Camp	7/30/13	1050		2	X	X	X	X				
Area B Camp	7/30/13	1443		1	X	X	X	X				
Area B Camp	7/30/13	1443		2	X	X	X	X				
Area B Top	7/31/13	0940		1	X	X	X	X				
Area B Top	7/31/13	0940		2	X	X	X	X				
Comments/Special Instructions	Received by (Signature) <b>M. Bacon</b> Printed Name <b>Mary Bacon</b> Company <b>NewFields</b>				Relinquished by (Signature) <b>[Signature]</b> Printed Name <b>Jennifer Millego</b> Company <b>ARI</b>				Received by (Signature) _____ Printed Name _____ Company _____			
	Date & Time <b>7/31/13 1710</b>				Date & Time <b>7/31/13 1710</b>				Date & Time _____			

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client Newfields  
COC No(s) \_\_\_\_\_ (NA)  
Assigned ARI Job No WZ47

Project Name: Balboa Marina  
Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: \_\_\_\_\_  
Tracking No. \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (YES) NO (NO)  
Were custody papers included with the cooler? YES (YES) NO (NO)  
Were custody papers properly filled out (ink, signed, etc) YES (YES) NO (NO)  
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 2.6  
If cooler temperature is out of compliance fill out form 00070F  
Cooler Accepted by: JM Date: 7/31/13 Time: 1710 Temp Gun ID#: 90877952

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? YES (NB)  
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: BW  
Was sufficient ice used (if appropriate)? NA YES (YES) NO (NO)  
Were all bottles sealed in individual plastic bags? YES (YES) NO (NO)  
Did all bottles arrive in good condition (unbroken)? YES (YES) NO (NO)  
Were all bottle labels complete and legible? YES (YES) NO (NO)  
Did the number of containers listed on COC match with the number of containers received? YES (YES) NO (NO) TS  
Did all bottle labels and tags agree with custody papers? YES (YES) NO (NO)  
Were all bottles used correct for the requested analyses? YES (YES) NO (NO)  
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs). NA (NA) YES (YES) NO (NO)  
Were all VOC vials free of air bubbles? NA (NA) YES (YES) NO (NO)  
Was sufficient amount of sample sent in each bottle? YES (YES) NO (NO)  
Date VOC Trip Blank was made at ARI... NA (NA)  
Was Sample Split by ARI: NA (NA) YES (YES) Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_  
Samples Logged by: TS Date: 8-1-13 Time: 825

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions: 6 containers per sample not 3.

By: TS Date: 8-1-13

			Small → "sm"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

---

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: WZ47



## Case Narrative

**Client:** Newfields  
**Project:** Balboa Marina  
**ARI Job No.:** WZ47

### Sample Receipt

Four sediment samples were received on July 31, 2013 under ARI job WZ47. The cooler temperature measured by IR thermometer following ARI SOP was 2.6°C. For further details regarding sample receipt, please refer to the Cooler Receipt Form.

### PAHs by SW8270-SIM

The samples and associated laboratory QC were extracted and analyzed within the method recommended holding times.

The initial and continuing calibration had results within method requirements. The internal standard areas were within accepted limits.

The surrogate percent recoveries were within the control limits.

The method blank was clean at the reporting limit. The LCS percent recoveries were within limits.

The matrix spike percent recovery of Fluoranthene was outside advisory control limits high for sample **Area A Comp**. No corrective action is required for matrix QC.

### Butyltins by Krone 1988/8270-SIM

The samples and associated laboratory QC were extracted and analyzed within the method recommended holding times.

Initial and continuing calibrations were within method requirements. The internal standard areas were within accepted limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits. The LCS percent recoveries were within the control limits.

The matrix spike and matrix spike duplicate percent recoveries were within advisory control limits.



### Pesticides by SW8081

The samples and associated laboratory QC were extracted and analyzed within the method recommended holding times.

Initial calibrations were within method requirements.

The closing DDT breakdown was outside the 15% control limit low on the second column. The associated closing calibration fell outside the control limit low for several compounds on the first column, and fell out low for 4,4'-DDT on the second column due to matrix effects. No corrective action was taken.

The internal standard areas were within accepted limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits. The LCS percent recoveries were within the control limits.

Several matrix spike and matrix spike duplicate percent recoveries were outside advisory control limits for sample **LA-3**. No corrective action is required for matrix QC.

### PCB Congeners by SW8082

The samples and associated laboratory QC were extracted and analyzed within the method recommended holding times.

Initial and continuing calibrations were within method requirements. The internal standard areas were within accepted limits.

The surrogate percent recoveries were within advisory control limits.

The method blank was clean at the reporting limits. The LCS percent recoveries were within the control limits.

The matrix spike and matrix spike duplicate percent recoveries were not within advisory control limits for two congeners for sample **Area B Top**. Since the percent recoveries for all congeners were within acceptable advisory QC limits for the corresponding LCS, it was concluded that the sample matrix was the cause of the poor MS recoveries. No corrective actions were taken.





### **Metals and Mercury**

The samples and associated matrix QC were digested and analyzed within method recommended holding times.

The method blanks were clean at the reporting limits. The LCS percent recoveries were within control limits.

The matrix spike percent recoveries and duplicate RPDs were within control limits.

### **General Chemistry Parameters**

The samples and associated matrix QC were prepared and analyzed within method recommended holding times.

The method blanks were clean at the reporting limits. The LCS percent recovery was within control limits.

The SRM percent recovery was within limits.

The replicate RPDs were within control limits.

### **Geotechnical Parameters**

A laboratory-specific narrative follows this page.



**Client:** Newfields Northwest

**ARI Job No.:** WZ47

**Client Project:** Balboa Marina

**Client Project No.:** 860.0100.000

### Case Narrative

1. Four samples were submitted for analysis on August 1, 2013, and were in good condition.
2. The samples were submitted for grain size distribution according to Puget Sound Estuary Protocol (PSEP) methodology. The samples were run in a single batch and one sample from this job, LA-3, was chosen for triplicate analysis. The triplicate data is reported on the QA summary. One sample contained woody or other organic matter which may have broken down during the sieving process, affecting the grain size analysis.
3. The samples were submitted for specific gravity determination according to ASTM D854.
4. Two samples contained shell fragments.
5. One sample emanated a strong fuel-like odor.
6. The data is provided in summary tables and plots.
7. There were no other noted anomalies in this project.

Released by: *Shirley Curtis*  
Geotechnical Laboratory Manager

Date: *8/14/13*

Reviewed by: *Yan Li*  
Technician

Date: *8/14/13*

# Sample ID Cross Reference Report



ARI Job No: WZ47  
Client: Newfields Northwest  
Project Event: 860.0100.000  
Project Name: Balboa Marina

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. LA-3	WZ47A	13-15981	Sediment	07/30/13 12:12	07/31/13 17:10
2. Area A Comp	WZ47B	13-15982	Sediment	07/30/13 10:50	07/31/13 17:10
3. Area B Comp	WZ47C	13-15983	Sediment	07/30/13 14:43	07/31/13 17:10
4. Area B Top	WZ47D	13-15984	Sediment	07/31/13 09:40	07/31/13 17:10



## Data Reporting Qualifiers

Effective 2/14/2011

### Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- \* Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but  $\geq$  the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is  $\leq 5$  times the Reporting Limit and the replicate control limit defaults to  $\pm 1$  RL instead of the normal 20% RPD

### Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- \* Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ( $< 20\%$  RSD,  $< 20\%$  Drift or minimum RRF).



- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by  $\geq 40\%$  RPD with no obvious chromatographic interference
- X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
- Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**



## Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting



<b>DL, LOD, LOQ and Control Limits Summary</b>					
<b>Analysis of Solid Samples for PNA EPA Method 8270 – SIM</b>					
Microwave (EPA 3546) or Sonication (EPA 3550C) Extraction ,10 g sample to 0.5 mL final volume. ARI Bench Sheet 3060F or 3051F					
Analyte	DL <sup>1</sup> µg/kg	LOD <sup>1</sup> µg/kg	LOQ <sup>1</sup> µg/kg	LCS Control Limit <sup>3,4</sup>	Replicate RPD <sup>5</sup>
Naphthalene	2.63	<b>5.0</b>	<b>5.0</b>	37 – <b>100</b>	≤ 30
1-Methylnaphthalene	1.71	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
2-Methylnaphthalene	1.52	<b>2.5</b>	<b>5.0</b>	37 – <b>100</b>	≤ 30
Biphenyl	1.44	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
2,6-Dimethylnaphthalene	0.75	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Acenaphthylene	1.26	<b>2.5</b>	<b>5.0</b>	35 – <b>100</b>	≤ 30
Acenaphthene	1.32	<b>2.5</b>	<b>5.0</b>	39 – <b>100</b>	≤ 30
Dibenzofuran	1.51	<b>2.5</b>	<b>5.0</b>	39 – <b>100</b>	≤ 30
1,6,7-Trimethylnaphthalene	0.42	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Fluorene	1.29	<b>2.5</b>	<b>5.0</b>	42 – <b>100</b>	≤ 30
Benzothiophene	0.43	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Phenanthrene	1.98	<b>2.5</b>	<b>5.0</b>	47 – <b>100</b>	≤ 30
Anthracene	1.46	<b>2.5</b>	<b>5.0</b>	41 – 106	≤ 30
Carbazole	0.62	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
1-Methylphenanthrene	0.70	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Fluoranthene	1.77	<b>4.0</b>	<b>5.0</b>	52 – 109	≤ 30
Pyrene	2.22	<b>4.0</b>	<b>5.0</b>	47 – 111	≤ 30
Benzo(a)anthracene	1.60	<b>2.5</b>	<b>5.0</b>	47 – 114	≤ 30
Chrysene	1.88	<b>2.5</b>	<b>5.0</b>	51 – 106	≤ 30
Benzo(b)fluoranthene	1.90	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Benzo(k)fluoranthene	2.05	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Benzo(j)fluoranthene	1.98 <sup>7</sup>	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Benzo(e)pyrene	0.65	<b>2.5</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Benzo(a)pyrene	1.75	<b>2.5</b>	<b>5.0</b>	44 – 111	≤ 30
Indeno(1,2,3-cd)pyrene	3.47	<b>4.0</b>	<b>5.0</b>	41 – 114	≤ 30
Dibenz(a,h)anthracene	2.38	<b>4.0</b>	<b>5.0</b>	42 – 116	≤ 30
Benzo(g,h,i)perylene	3.05	<b>4.0</b>	<b>5.0</b>	37 – 115	≤ 30
Perylene	2.99	<b>4.0</b>	<b>5.0</b>	30 – 160 <sup>6</sup>	≤ 30
Surrogate Recovery			MB / LCS	Samples	RPD
2-Methylnaphthalene-d <sub>10</sub>			35 – <b>100</b>	34 – <b>100</b>	≤ 30
Fluoranthene-d <sub>10</sub>			30 – 160 <sup>6</sup>	30 – 160 <sup>6</sup>	≤ 30
Dibenzo(a,h)anthracene-d <sub>14</sub>			37 – 120	<b>10</b> – 117	≤ 30

(1) Detection Limit (DL), Limit of Detection (LOD), Limit of Quantitation (LOQ) as defined in ARI SOP 1018S

(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(4) Control limits calculated using all data from 1/1/08 through 12/31/08.

(5) Relative Percent Difference between analytes in replicate analyzes. If C<sub>O</sub> and C<sub>D</sub> are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$

(6) Default limits pending generation of historic limits.

(7) Average of the (b) and (k) isomers used until sufficient data is available to calculate a DL.



### Quality Control Summary for Butyl Tin Compounds EPA Methods 8270D – SIM

Analyte	DL <sup>1</sup>	LOD <sup>1</sup>	LOQ <sup>1</sup>	Spike Recovery Limits (%) <sup>2,3</sup>			RPD <sup>4</sup>
				LCS	MB/LCS Surrogate	Sample Surrogate	
Tributyl Tin Ion <sup>5</sup>	0.043 µg/L	0.096 µg/L	0.193 µg/L	30-160	--	--	≤ 40
Dibutyl Tin Ion <sup>5</sup>	0.096 µg/L	0.216 µg/L	0.433 µg/L	30-160	--	--	≤ 40
Butyl Tin Ion <sup>5</sup>	0.108 µg/L	0.153 µg/L	0.306 µg/L	30-160	--	--	≤ 40
Triphenyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tripropyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tributyl Tin Ion <sup>6</sup>	--	--	0.0052 µg/L	30-160	--	--	≤ 40
Dibutyl Tin Ion <sup>6</sup>	--	--	0.0077 µg/L	30-160	--	--	≤ 40
Butyl Tin Ion <sup>6</sup>	--	--	0.0054 µg/L	30-160	--	--	≤ 40
Triphenyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tripropyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tributyl Tin Ion	1.52 µg/kg	1.93 µg/kg	3.86 µg/kg	40 – 144	--	--	≤ 40
Dibutyl Tin Ion	3.72 µg/kg	4.33 µg/kg	5.78 µg/kg	34 – 115	--	--	≤ 40
Butyl Tin Ion	2.95 µg/kg	3.06 µg/kg	4.08 µg/kg	<b>10 – 111</b>	--	--	≤ 40
Triphenyl Tin	--	--	--	--	35 – 130	25 – 140	≤ 40
Tripropyl Tin	--	--	--	--	28 – 106	32 – 104	≤ 40

(1) Detection Limit (DL), limit of detection (LOD) and limit of quantitation (LOQ) as defined in ARI SOP 1018S.

(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. These limits are not used as the sole reason to reject data from a batch of analytes.

(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analytes. If C<sub>O</sub> and C<sub>D</sub> are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_o - C_D|}{\frac{C_o + C_D}{2}} \times 100$$

(5) DL from ARI MDL study QD32

(6) ARI does not report concentrations below the LOQ (low calibration standard concentration) and does not, therefore, determine a DL or LOD for butyl tin analysis in interstitial (pore) water.





4

DL <sup>1</sup> , LOD <sup>1</sup> , LOQ <sup>1</sup> and Control Limits Summary					
Analysis of Soil/Sediment Samples for Chlorinated Pesticides					
EPA Method 8081B					
Microwave (EPA Method 3546) Extraction using 12.5g (dry weight) sample with extract concentrated to 2.5 mL final volume. ARI Bench Sheet 3046F					
LOD Spike level = LOQ Concentration					
Analyte	DL <sup>1,2</sup> µg/kg	LOD <sup>1</sup> µg/kg	LOQ <sup>1</sup> µg/kg	LCS Control Limit <sup>3,4</sup>	Replicate RPD <sup>5</sup>
alpha-BHC	0.081	0.25	0.5	68 – 115	≤ 40
beta-BHC	0.139	0.25	0.5	60 – 126	≤ 40
gamma-BHC (Lindane)	0.048	0.25	0.5	68 – 134	≤ 40
delta-BHC	0.082	0.25	0.5	71 – 154	≤ 40
Heptachlor	0.132	0.25	0.5	66 – 115	≤ 40
Aldrin	0.055	0.25	0.5	66 – 115	≤ 40
Heptachlor Epoxide	0.085	0.25	0.5	65 – 127	≤ 40
trans-Chlordane (beta-Chlordane, gamma-Chlordane)	0.077	0.25	0.5	73 – 136	≤ 40
cis-Chlordane (alpha-chlordane)	0.051	0.25	0.5	77 – 124	≤ 40
Endosulfan I	0.072	0.25	0.5	28 – <b>100</b>	≤ 40
4,4'-DDE	0.124	0.5	1.0	71 – 149	≤ 40
Dieldrin	0.100	0.5	1.0	74 – 131	≤ 40
Endrin	0.215	0.5	1.0	72 – 135	≤ 40
Endosulfan II	0.116	0.5	1.0	37 – 110	≤ 40
4,4'-DDD	0.135	0.5	1.0	76 – 137	≤ 40
Endrin Aldehyde	0.218	0.5	1.0	38 – 109	≤ 40
4,4'-DDT	0.192	0.5	1.0	58 – 144	≤ 40
Endosulfan Sulfate	0.192	0.5	1.0	47 – 148	≤ 40
Endrin Ketone	0.119	0.5	1.0	29 – 165	≤ 40
Methoxychlor	0.698	2.5	5.0	65 – 123	≤ 40
Hexachlorobutadiene	0.138	0.5	1.0	43 – 104	≤ 40
Hexachlorobenzene	0.094	0.5	1.0	62 – 119	≤ 40
Surrogate Standard Recovery			MB / LCS	Samples	RPD
Tetrachloro- <i>m</i> -xylene (TCMX)			47 – 124	34 – 169	≤ 40
Decachlorobiphenyl			60 – 149	36 – 182	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation as defined in ARI SOP 1018S.

(2) MDL study QZ38

(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(4) Control limits calculated using all data from 1/1/12 through 7/31/12.

(5) Relative Percent Difference between analytes in replicate analyzes. If C<sub>o</sub> and C<sub>d</sub> are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_o - C_d|}{\frac{C_o + C_d}{2}} \times 100$$



**PCB Congener Analysis of Soil / Sediment Samples**  
**LOD<sup>1</sup>, LOQ<sup>2</sup> and Control Limits Summary**  
**EPA Method 8082A**

12.5 gram sample to 2.5 mL final volume – Microwave extraction (EPA Method 3546)

	LOD <sup>1</sup> µg/kg	LOQ <sup>2</sup> µg/kg	LCS % Recovery <sup>3</sup>	Replicate RPD <sup>4</sup>
PCB 8	0.265	1	30 – 160	≤ 40
PCB 18	0.093	1	30 – 160	≤ 40
PCB 28	0.098	1	30 – 160	≤ 40
PCB 31	0.146	1	30 – 160	≤ 40
PCB 33	0.267	1	30 – 160	≤ 40
PCB 44	0.108	1	30 – 160	≤ 40
PCB 49	0.157	1	30 – 160	≤ 40
PCB 52	0.211	1	30 – 160	≤ 40
PCB 56	0.036	1	30 – 160	≤ 40
PCB 60	0.053	1	30 – 160	≤ 40
PCB 66	0.100	1	30 – 160	≤ 40
PCB 70	0.208	1	30 – 160	≤ 40
PCB 74	0.238	1	30 – 160	≤ 40
PCB 87	0.130	1	30 – 160	≤ 40
PCB 95	0.086	1	30 – 160	≤ 40
PCB 97	0.168	1	30 – 160	≤ 40
PCB 99	0.140	1	30 – 160	≤ 40
PCB 101	0.094	1	30 – 160	≤ 40
PCB 105	0.068	1	30 – 160	≤ 40
PCB 110	0.179	1	30 – 160	≤ 40
PCB 118	0.134	1	30 – 160	≤ 40
PCB 128	0.204	1	30 – 160	≤ 40
PCB 132	0.110	1	30 – 160	≤ 40
PCB 138	0.068	1	30 – 160	≤ 40
PCB 141	0.086	1	30 – 160	≤ 40
PCB 149	0.144	1	30 – 160	≤ 40
PCB 151	0.111	1	30 – 160	≤ 40
PCB 153	0.129	1	30 – 160	≤ 40
PCB 156	0.174	1	30 – 160	≤ 40
PCB 158	0.081	1	30 – 160	≤ 40
PCB 170	0.076	1	30 – 160	≤ 40
PCB 174	0.265	1	30 – 160	≤ 40
PCB 177	0.226	1	30 – 160	≤ 40
PCB 180	0.203	1	30 – 160	≤ 40
PCB 183	0.160	1	30 – 160	≤ 40
PCB 187	0.186	1	30 – 160	≤ 40
PCB 194	0.128	1	30 – 160	≤ 40
PCB 195	0.163	1	30 – 160	≤ 40
PCB 201	0.075	1	30 – 160	≤ 40
PCB 203	0.199	1	30 – 160	≤ 40



Surrogate % Recovery	MB / LCS	Sample	
Terachloro- <i>meta</i> -Xylene (TCMX)	30 – 160	30 – 160	≤ 40
PCB #209 (Decachlorobiphenyl)	30 – 160	30 – 160	≤ 40

- (1) Limit of Detection as defined in ARI SOP 1018S (Concentration of spike used to determine LOD)
- (2) Limit of Quantitation as defined in ARI SOP 1018S
- (3) 30 – 160 are default values used when there is insufficient data to calculate historic control limits.
- (4) Relative Percent Difference between analytes in replicate analyzes. If  $C_o$  and  $C_D$  are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_o - C_D|}{\frac{C_o + C_D}{2}} \times 100$$



**Quality Control Parameters for Metals Analysis ICP-MS EPA  
Methods 200.8 or 6020A**

Analyte	Mass	Aqueous Samples <sup>2</sup>			Spike Recovery		RPD <sup>3</sup>	Solids <sup>2</sup>
		DL <sup>1</sup> µg/L	LOD <sup>1</sup> µg/L	LOQ <sup>1</sup> µg/L	Matrix Spike	LCS		LOQ <sup>1</sup> mg/kg
Aluminum	27	1.601	10	<b>20.0</b>	75 – 125	80 – 120	≤ 20	<b>20.0</b>
Antimony	121	0.010	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
	123	0.011	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Arsenic #1	75	0.048	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Arsenic #2	75	0.092	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
Barium	135	0.020	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
	137	0.019	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
Beryllium	9	0.021	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Cadmium	111	0.010	0.05	<b>0.1</b>	75 – 125	80 – 120	≤ 20	<b>0.1</b>
	114	0.005	0.05	<b>0.1</b>	75 – 125	80 – 120	≤ 20	<b>0.1</b>
Calcium	43	3.983	25	<b>50.0</b>	75 – 125	80 – 120	≤ 20	<b>50.0</b>
Chromium	52	0.045	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
	53	0.118	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
Cobalt	59	0.011	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Copper	63	0.158	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
	65	0.236	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
Iron	54	5.753	10	<b>20.0</b>	75 – 125	80 – 120	≤ 20	<b>20.0</b>
	57	3.876	10	<b>20.0</b>	75 – 125	80 – 120	≤ 20	<b>20.0</b>
Lead	208	0.046	0.05	<b>0.1</b>	75 – 125	80 – 120	≤ 20	<b>0.1</b>
Magnesium	24	0.297	10	<b>20.0</b>	75 – 125	80 – 120	≤ 20	<b>20.0</b>
Manganese	55	0.022	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
Molybdenum	98	0.013	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Nickel	60	0.079	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
	62	0.089	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
Potassium	39	2.944	10	<b>20.0</b>	75 – 125	80 – 120	≤ 20	<b>20.0</b>
Selenium	82	0.127	0.25	<b>0.5</b>	75 – 125	80 – 120	≤ 20	<b>0.5</b>
	78	0.324	1.0	<b>2.0</b>	75 – 125	80 – 120	≤ 20	<b>2.0</b>
Silver	107	0.008	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Sodium	23	2.833	50	<b>100.0</b>	75 – 125	80 – 120	≤ 20	<b>100.0</b>
Thorium <sup>4</sup>	232	0.013	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Thallium	205	0.004	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Uranium <sup>4</sup>	238	0.003	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Vanadium	51	0.043	0.1	<b>0.2</b>	75 – 125	80 – 120	≤ 20	<b>0.2</b>
Zinc	66	0.497	2	<b>4.0</b>	75 – 125	80 – 120	≤ 20	<b>4.0</b>
	67	0.531	2	<b>4.0</b>	75 – 125	80 – 120	≤ 20	<b>4.0</b>
	68	0.524	2	<b>4.0</b>	75 – 125	80 – 120	≤ 20	<b>4.0</b>

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S  
 (2) 50 mL sample and 50 mL final volume Solids LOQ based on 100% solids using 1.0 g sample 100 mL final volume.

(3) Relative Percent Difference in replicate analyzes.  $RPD = \frac{|C_o - C_D|}{\frac{C_o + C_D}{2}} \times 100$  where C<sub>o</sub>=Original, C<sub>D</sub>=Duplicate

(4) ARI has no accreditation for these elements.



<b>Quality Control Parameters for Mercury Analysis using CVAA EPA Methods 7470A or 245.1 for Aqueous Samples EPA Methods 7471B or 245.5 for Solid Samples</b>						
	<b>Aqueous Samples<sup>2</sup></b>			<b>Spike Recovery</b>		<b>RPD<sup>5</sup></b>
	<b>DL<sup>1</sup> µg/L</b>	<b>LOD<sup>1</sup> µg/L</b>	<b>LOQ<sup>1</sup> µg/L</b>	<b>Matrix Spike</b>	<b>LCS</b>	
<b>Mercury</b>	0.0069	0.05	<b>0.10<sup>2</sup></b>	75 – 125	80 – 120	≤ 20
<b>Mercury (low level)</b>	0.0026	0.01	<b>0.02<sup>2</sup></b>	75 – 125	80 – 120	≤ 20
	<b>Soil / Sediment Samples</b>			<b>Spike Recovery</b>		<b>RPD<sup>5</sup></b>
	<b>DL<sup>1</sup> mg/kg</b>	<b>LOD<sup>1</sup> mg/kg</b>	<b>LOQ<sup>1</sup> mg/kg</b>	<b>Matrix Spike</b>	<b>LCS</b>	
<b>Mercury</b>	0.0021	0.0125	0.025 <sup>3</sup>	75 – 125	80 – 120	≤ 20
	<b>Tissue Samples</b>			<b>Spike Recovery</b>		<b>RPD<sup>5</sup></b>
	<b>DL<sup>1</sup> mg/kg</b>	<b>LOD<sup>1</sup> mg/kg</b>	<b>LOQ<sup>1</sup> mg/kg</b>	<b>Matrix Spike</b>	<b>LCS</b>	
<b>Mercury</b>	0.0004	0.0025	0.005 <sup>4</sup>	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S

(2) 20 mL sample with 20 mL final volume

(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.

(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.

(5) Relative Percent Difference between analytes in replicate analyzes. If C<sub>O</sub> and C<sub>D</sub> are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$



## Spike Recovery Control Limits for Conventional Wet Chemistry

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

Sample Matrix:	ARI's Control Limits	
	Water	Soil / Sediment
<b>Matrix Spike Recoveries</b>	% Recovery	% Recovery
Ammonia	75 - 125	75 - 125
Bromide	75 - 125	75 - 125
Chloride	75 - 125	75 - 125
Cyanide	75 - 125	75 - 125
Ferrous Iron	75 - 125	75 - 125
Fluoride	75 - 125	75 - 125
Formaldehyde	75 - 125	75 - 125
Hexane Extractable Material	-- - --	78 - 114
Hexavalent Chromium	75 - 125	75 - 125
Nitrate/Nitrite	75 - 125	75 - 125
Oil and Grease	75 - 125	75 - 125
Phenol	75 - 125	75 - 125
Phosphorous	75 - 125	75 - 125
Sulfate	75 - 125	75 - 125
Sulfide	75 - 125	75 - 125
Total Kjeldahl Nitrogen	75 - 125	75 - 125
Total Organic Carbon	75 - 125	75 - 125
<b>Duplicate RPDs</b>		
Acidity	±20%	±20%
Alkalinity	±20%	±20%
BOD	±20%	±20%
Cation Exchange	±20%	±20%
COD	±20%	±20%
Conductivity	±20%	±20%
Salinity	±20%	±20%
Solids	±20%	±20%
Turbidity	±20%	±20%

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**SIM PAH Analysis  
Report and Summary QC Forms**

**ARI Job ID: WZ47**

ORGANICS ANALYSIS DATA SHEET  
PNAs by SIM SW8270D-SIM GC/MS  
Extraction Method: SW3546  
Page 1 of 1

Sample ID: LA-3  
SAMPLE

Lab Sample ID: WZ47A  
LIMS ID: 13-15981  
Matrix: Sediment  
Data Release Authorized: *RB*  
Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

Date Extracted: 08/06/13  
Date Analyzed: 08/08/13 20:46  
Instrument/Analyst: NT4/JZ  
GPC Cleanup: No  
Silica Gel Cleanup: Yes  
Alumina Cleanup: No

Sample Amount: 10.30 g-dry-wt  
Final Extract Volume: 0.5 mL  
Dilution Factor: 1.00  
Percent Moisture: 53.3%

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	4.8	7.9
91-57-6	2-Methylnaphthalene	4.8	7.1
90-12-0	1-Methylnaphthalene	4.8	3.1 J
208-96-8	Acenaphthylene	4.8	< 4.8 U
83-32-9	Acenaphthene	4.8	< 4.8 U
86-73-7	Fluorene	4.8	2.7 J
85-01-8	Phenanthrene	4.8	10
120-12-7	Anthracene	4.8	3.2 J
206-44-0	Fluoranthene	4.8	23
129-00-0	Pyrene	4.8	20
56-55-3	Benzo (a) anthracene	4.8	9.0
218-01-9	Chrysene	4.8	12
205-99-2	Benzo (b) fluoranthene	4.8	10
207-08-9	Benzo (k) fluoranthene	4.8	5.0
50-32-8	Benzo (a) pyrene	4.8	9.6
193-39-5	Indeno (1,2,3-cd) pyrene	4.8	6.8
53-70-3	Dibenz (a,h) anthracene	4.8	< 4.8 U
191-24-2	Benzo (g,h,i) perylene	4.8	10
132-64-9	Dibenzofuran	4.8	2.9 J

Reported in µg/kg (ppb)

**SIM Semivolatile Surrogate Recovery**

d10-Fluoranthene	90.3%
d10-2-Methylnaphthalene	67.7%
d14-Dibenzo (a,h) anthracene	77.0%



**ORGANICS ANALYSIS DATA SHEET**  
**PNA's by SIM SW8270D-SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area A Comp  
SAMPLE**

Lab Sample ID: WZ47B  
 LIMS ID: 13-15982  
 Matrix: Sediment  
 Data Release Authorized: *B*  
 Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/08/13 21:14  
 Instrument/Analyst: NT4/JZ  
 GPC Cleanup: No  
 Silica Gel Cleanup: Yes  
 Alumina Cleanup: No

Sample Amount: 10.73 g-dry-wt  
 Final Extract Volume: 0.5 mL  
 Dilution Factor: 1.00  
 Percent Moisture: 23.4%

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	4.7	4.6 J
91-57-6	2-Methylnaphthalene	4.7	2.8 J
90-12-0	1-Methylnaphthalene	4.7	< 4.7 U
208-96-8	Acenaphthylene	4.7	< 4.7 U
83-32-9	Acenaphthene	4.7	< 4.7 U
86-73-7	Fluorene	4.7	< 4.7 U
85-01-8	Phenanthrene	4.7	4.3 J
120-12-7	Anthracene	4.7	< 4.7 U
206-44-0	Fluoranthene	4.7	10
129-00-0	Pyrene	4.7	16
56-55-3	Benzo (a) anthracene	4.7	9.0
218-01-9	Chrysene	4.7	6.8
205-99-2	Benzo (b) fluoranthene	4.7	14
207-08-9	Benzo (k) fluoranthene	4.7	7.9
50-32-8	Benzo (a) pyrene	4.7	16
193-39-5	Indeno (1,2,3-cd) pyrene	4.7	8.4
53-70-3	Dibenz (a,h) anthracene	4.7	< 4.7 U
191-24-2	Benzo (g,h,i) perylene	4.7	11
132-64-9	Dibenzofuran	4.7	< 4.7 U

Reported in µg/kg (ppb)

**SIM Semivolatile Surrogate Recovery**

d10-Fluoranthene	97.7%
d10-2-Methylnaphthalene	66.7%
d14-Dibenzo(a,h)anthracen	85.7%

**ORGANICS ANALYSIS DATA SHEET**  
**PNA's by SIM SW8270D-SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area B Comp**  
**SAMPLE**

Lab Sample ID: WZ47C  
 LIMS ID: 13-15983  
 Matrix: Sediment  
 Data Release Authorized: *AB*  
 Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/08/13 22:40  
 Instrument/Analyst: NT4/JZ  
 GPC Cleanup: No  
 Silica Gel Cleanup: Yes  
 Alumina Cleanup: No

Sample Amount: 5.01 g-dry-wt  
 Final Extract Volume: 0.5 mL  
 Dilution Factor: 1.00  
 Percent Moisture: 16.8%

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	10	< 10 U
91-57-6	2-Methylnaphthalene	10	< 10 U
90-12-0	1-Methylnaphthalene	10	< 10 U
208-96-8	Acenaphthylene	10	< 10 U
<b>83-32-9</b>	<b>Acenaphthene</b>	<b>10</b>	<b>11</b>
<b>86-73-7</b>	<b>Fluorene</b>	<b>10</b>	<b>7.3 J</b>
85-01-8	Phenanthrene	10	< 10 U
120-12-7	Anthracene	10	< 10 U
<b>206-44-0</b>	<b>Fluoranthene</b>	<b>10</b>	<b>6.4 J</b>
<b>129-00-0</b>	<b>Pyrene</b>	<b>10</b>	<b>6.6 J</b>
56-55-3	Benzo(a)anthracene	10	< 10 U
218-01-9	Chrysene	10	< 10 U
205-99-2	Benzo(b)fluoranthene	10	< 10 U
207-08-9	Benzo(k)fluoranthene	10	< 10 U
50-32-8	Benzo(a)pyrene	10	< 10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U
53-70-3	Dibenz(a,h)anthracene	10	< 10 U
191-24-2	Benzo(g,h,i)perylene	10	< 10 U
132-64-9	Dibenzofuran	10	< 10 U

Reported in µg/kg (ppb)

**SIM Semivolatile Surrogate Recovery**

d10-Fluoranthene	98.7%
d10-2-Methylnaphthalene	69.3%
d14-Dibenzo(a,h)anthracene	89.3%

**SIM SW8270 SURROGATE RECOVERY SUMMARY**

Matrix: Sediment

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000

<b>Client ID</b>	<b>FLN</b>	<b>MNP</b>	<b>DBA</b>	<b>TOT OUT</b>
LA-3	90.3%	67.7%	77.0%	0
MB-080613	102%	65.3%	96.7%	0
LCS-080613	102%	70.7%	95.3%	0
Area A Comp	97.7%	66.7%	85.7%	0
Area A Comp MS	97.0%	67.3%	89.3%	0
Area A Comp MSD	95.3%	65.7%	84.0%	0
Area B Comp	98.7%	69.3%	89.3%	0
Area B Top	94.0%	71.7%	78.7%	0

**LCS/MB LIMITS      QC LIMITS**

(FLN) = d10-Fluoranthene                      (30-160)                      (30-160)  
(MNP) = d10-2-Methylnaphthalene            (35-100)                      (34-100)  
(DBA) = d14-Dibenzo(a,h)anthracene        (37-120)                      (10-117)

Prep Method: SW3546  
Log Number Range: 13-15981 to 13-15984

**ORGANICS ANALYSIS DATA SHEET**

**PNAs by SW8270D-SIM GC/MS**


Page 1 of 1

**Sample ID: Area A Comp  
MATRIX SPIKE**

Lab Sample ID: WZ47B

LIMS ID: 13-15982

Matrix: Sediment

Data Release Authorized: 

Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

Event: 860.0100.000

Date Sampled: 07/30/13

Date Received: 07/31/13

Date Extracted MS/MSD: 08/06/13

Sample Amount MS: 10.74 g-dry-wt

MSD: 10.74 g-dry-wt

Date Analyzed MS: 08/08/13 21:43

Final Extract Volume MS: 0.50 mL

MSD: 08/08/13 22:12

MSD: 0.50 mL

Instrument/Analyst MS: NT4/JZ

Dilution Factor MS: 1.00

MSD: NT4/JZ

MSD: 1.00

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	4.6 J	92.1	140	62.5%	93.0	140	63.1%	1.0%
2-Methylnaphthalene	2.8 J	102	140	70.9%	102	140	70.9%	0.0%
1-Methylnaphthalene	< 4.7 U	101	140	72.1%	101	140	72.1%	0.0%
Acenaphthylene	< 4.7 U	125	140	89.3%	124	140	88.6%	0.8%
Acenaphthene	< 4.7 U	109	140	77.9%	106	140	75.7%	2.8%
Fluorene	< 4.7 U	123	140	87.9%	123	140	87.9%	0.0%
Phenanthrene	4.3 J	119	140	81.9%	118	140	81.2%	0.8%
Anthracene	< 4.7 U	139	140	99.3%	146	140	104%	4.9%
Fluoranthene	10	179	140	121%	146	140	97.1%	20.3%
Pyrene	16	170	140	110%	140	140	88.6%	19.4%
Benzo(a)anthracene	9.0	159	140	107%	149	140	100%	6.5%
Chrysene	6.8	148	140	101%	131	140	88.7%	12.2%
Benzo(b)fluoranthene	14	143	140	92.1%	129	140	82.1%	10.3%
Benzo(k)fluoranthene	7.9	139	140	93.6%	119	140	79.4%	15.5%
Benzo(a)pyrene	16	154	140	98.6%	141	140	89.3%	8.8%
Indeno(1,2,3-cd)pyrene	8.4	135	140	90.4%	124	140	82.6%	8.5%
Dibenz(a,h)anthracene	< 4.7 U	128	140	91.4%	121	140	86.4%	5.6%
Benzo(g,h,i)perylene	11	132	140	86.4%	121	140	78.6%	8.7%
Dibenzofuran	< 4.7 U	114	140	81.4%	109	140	77.9%	4.5%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**ORGANICS ANALYSIS DATA SHEET**  
**PNA's by SIM SW8270D-SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area A Comp**  
**MATRIX SPIKE**

Lab Sample ID: WZ47B  
 LIMS ID: 13-15982  
 Matrix: Sediment  
 Data Release Authorized: *AB*  
 Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/08/13 21:43  
 Instrument/Analyst: NT4/JZ  
 GPC Cleanup: No  
 Silica Gel Cleanup: Yes  
 Alumina Cleanup: No

Sample Amount: 10.74 g-dry-wt  
 Final Extract Volume: 0.5 mL  
 Dilution Factor: 1.00  
 Percent Moisture: 23.4%

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	4.7	---
91-57-6	2-Methylnaphthalene	4.7	---
90-12-0	1-Methylnaphthalene	4.7	---
208-96-8	Acenaphthylene	4.7	---
83-32-9	Acenaphthene	4.7	---
86-73-7	Fluorene	4.7	---
85-01-8	Phenanthrene	4.7	---
120-12-7	Anthracene	4.7	---
206-44-0	Fluoranthene	4.7	---
129-00-0	Pyrene	4.7	---
56-55-3	Benzo(a)anthracene	4.7	---
218-01-9	Chrysene	4.7	---
205-99-2	Benzo(b)fluoranthene	4.7	---
207-08-9	Benzo(k)fluoranthene	4.7	---
50-32-8	Benzo(a)pyrene	4.7	---
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	---
53-70-3	Dibenz(a,h)anthracene	4.7	---
191-24-2	Benzo(g,h,i)perylene	4.7	---
132-64-9	Dibenzofuran	4.7	---

Reported in µg/kg (ppb)

**SIM Semivolatile Surrogate Recovery**

d10-Fluoranthene	97.0%
d10-2-Methylnaphthalene	67.3%
d14-Dibenzo(a,h)anthracen	89.3%

**ORGANICS ANALYSIS DATA SHEET**  
**PNA's by SIM SW8270D-SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area A Comp**  
**MATRIX SPIKE DUPLICATE**

Lab Sample ID: WZ47B  
 LIMS ID: 13-15982  
 Matrix: Sediment  
 Data Release Authorized: *[Signature]*  
 Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/08/13 22:12  
 Instrument/Analyst: NT4/JZ  
 GPC Cleanup: No  
 Silica Gel Cleanup: Yes  
 Alumina Cleanup: No

Sample Amount: 10.74 g-dry-wt  
 Final Extract Volume: 0.5 mL  
 Dilution Factor: 1.00  
 Percent Moisture: 23.4%

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	4.7	---
91-57-6	2-Methylnaphthalene	4.7	---
90-12-0	1-Methylnaphthalene	4.7	---
208-96-8	Acenaphthylene	4.7	---
83-32-9	Acenaphthene	4.7	---
86-73-7	Fluorene	4.7	---
85-01-8	Phenanthrene	4.7	---
120-12-7	Anthracene	4.7	---
206-44-0	Fluoranthene	4.7	---
129-00-0	Pyrene	4.7	---
56-55-3	Benzo(a)anthracene	4.7	---
218-01-9	Chrysene	4.7	---
205-99-2	Benzo(b)fluoranthene	4.7	---
207-08-9	Benzo(k)fluoranthene	4.7	---
50-32-8	Benzo(a)pyrene	4.7	---
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	---
53-70-3	Dibenz(a,h)anthracene	4.7	---
191-24-2	Benzo(g,h,i)perylene	4.7	---
132-64-9	Dibenzofuran	4.7	---

Reported in µg/kg (ppb)

**SIM Semivolatile Surrogate Recovery**

d10-Fluoranthene	95.3%
d10-2-Methylnaphthalene	65.7%
d14-Dibenzo(a,h)anthracen	84.0%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1



Sample ID: LCS-080613

LAB CONTROL SAMPLE

Lab Sample ID: LCS-080613

LIMS ID: 13-15982

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

Event: 860.0100.000

Date Sampled: NA

Date Received: NA

Date Extracted: 08/06/13

Date Analyzed LCS: 08/08/13 20:17

Instrument/Analyst LCS: NT4/JZ

Sample Amount LCS: 10.00 g-dry-wt

Final Extract Volume LCS: 0.50 mL

Dilution Factor LCS: 1.00

Analyte	LCS	Spike Added	Recovery
Naphthalene	106	150	70.7%
2-Methylnaphthalene	113	150	75.3%
1-Methylnaphthalene	110	150	73.3%
Acenaphthylene	124	150	82.7%
Acenaphthene	109	150	72.7%
Fluorene	129	150	86.0%
Phenanthrene	124	150	82.7%
Anthracene	141	150	94.0%
Fluoranthene	152	150	101%
Pyrene	138	150	92.0%
Benzo(a)anthracene	160	150	107%
Chrysene	143	150	95.3%
Benzo(b)fluoranthene	135	150	90.0%
Benzo(k)fluoranthene	143	150	95.3%
Benzo(a)pyrene	146	150	97.3%
Indeno(1,2,3-cd)pyrene	140	150	93.3%
Dibenz(a,h)anthracene	147	150	98.0%
Benzo(g,h,i)perylene	135	150	90.0%
Dibenzofuran	116	150	77.3%

Reported in µg/kg (ppb)

**SIM Semivolatile Surrogate Recovery**

d10-Fluoranthene	102%
d10-2-Methylnaphthalene	70.7%
d14-Dibenzo(a,h)anthracen	95.3%

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

WZ47MBS1

Lab Name: ANALYTICAL RESOURCES INC  
ARI Job No: WZ47  
Lab File ID: 08081318  
Instrument ID: NT4  
Matrix: SOLID

Client: NEWFIELDS NORTHWEST  
Project: BALBOA MARINA  
Date Extracted: 08/06/13  
Date Analyzed: 08/08/13  
Time Analyzed: 1948


THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	WZ47LCSS1	WZ47LCSS1	08081319	08/08/13
02	LA-3	WZ47A	08081320	08/08/13
03	AREA A COMP	WZ47B	08081321	08/08/13
04	AREA A COMP MS	WZ47BMS	08081322	08/08/13
05	AREA A COMP MSD	WZ47BMSD	08081323	08/08/13
06	AREA B COMP	WZ47C	08081324	08/08/13
07	AREA B TOP	WZ47D	08081325	08/08/13
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**ORGANICS ANALYSIS DATA SHEET**  
**PNAs by SIM SW8270D-SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: MB-080613**  
**METHOD BLANK**

Lab Sample ID: MB-080613  
 LIMS ID: 13-15982  
 Matrix: Sediment  
 Data Release Authorized:   
 Reported: 08/13/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: NA  
 Date Received: NA

Date Extracted: 08/06/13  
 Date Analyzed: 08/08/13 19:48  
 Instrument/Analyst: NT4/JZ  
 GPC Cleanup: No  
 Silica Gel Cleanup: Yes  
 Alumina Cleanup: No

Sample Amount: 10.00 g-dry-wt  
 Final Extract Volume: 0.5 mL  
 Dilution Factor: 1.00  
 Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	5.0	< 5.0 U
208-96-8	Acenaphthylene	5.0	< 5.0 U
83-32-9	Acenaphthene	5.0	< 5.0 U
86-73-7	Fluorene	5.0	< 5.0 U
85-01-8	Phenanthrene	5.0	< 5.0 U
120-12-7	Anthracene	5.0	< 5.0 U
206-44-0	Fluoranthene	5.0	< 5.0 U
129-00-0	Pyrene	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	5.0	< 5.0 U
218-01-9	Chrysene	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0	< 5.0 U
132-64-9	Dibenzofuran	5.0	< 5.0 U

Reported in µg/kg (ppb)

**SIM Semivolatile Surrogate Recovery**

d10-Fluoranthene 102%  
 d10-2-Methylnaphthalene 65.3%  
 d14-Dibenzo(a,h)anthracen 96.7%

5B  
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

Instrument ID: NT4

Project: BALBOA MARINA

DFTPP Injection Date: 08/06/13

DFTPP Injection Time: 1524

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	17.1
68	Less than 2.0% of mass 69	0.0 ( 0.0)1
69	Mass 69 relative abundance	21.9
70	Less than 2.0% of mass 69	0.1 ( 0.6)1
127	10.0 - 80.0% of mass 198	39.7
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.4
275	10.0 - 60.0% of mass 198	33.2
365	Greater than 1.0% of mass 198	4.33
441	0.0 - 24.0% of mass 442	27.0 ( 16.3)2
442	50.0 - 200.0% of mass 198	165.4
443	15.0 - 24.0% of mass 442	36.7 ( 22.2)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC010806	IC010806	08061302	08/06/13	1658
02	IC050806	IC050806	08061303	08/06/13	1739
03	IC10806	IC10806	08061304	08/06/13	1808
04	IC250806	IC250806	08061305	08/06/13	1837
05	IC50806	IC50806	08061306	08/06/13	1906
06	IC100806	IC100806	08061307	08/06/13	1934
07					
08					
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5B  
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

Instrument ID: NT4

Project: BALBOA MARINA

DFTPP Injection Date: 08/08/13

DFTPP Injection Time: 1116

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	15.0
68	Less than 2.0% of mass 69	0.0 ( 0.0)1
69	Mass 69 relative abundance	20.0
70	Less than 2.0% of mass 69	0.1 ( 0.3)1
127	10.0 - 80.0% of mass 198	37.7
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.3
275	10.0 - 60.0% of mass 198	34.8
365	Greater than 1.0% of mass 198	4.32
441	0.0 - 24.0% of mass 442	29.3 ( 16.9)2
442	50.0 - 200.0% of mass 198	173.6
443	15.0 - 24.0% of mass 442	39.2 ( 22.6)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC0808	CC0808	08081302	08/08/13	1207
02	WZ47MBS1	WZ47MBS1	08081318	08/08/13	1948
03	WZ47LCSS1	WZ47LCSS1	08081319	08/08/13	2017
04	LA-3	WZ47A	08081320	08/08/13	2046
05	AREA A COMP	WZ47B	08081321	08/08/13	2114
06	AREA A COMP MS	WZ47BMS	08081322	08/08/13	2143
07	AREA A COMP MSD	WZ47BMSD	08081323	08/08/13	2212
08	AREA B COMP	WZ47C	08081324	08/08/13	2240
09	AREA B TOP	WZ47D	08081325	08/08/13	2309
10					
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22					



## SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No: WZ47

Project: BALBOA MARINA

Instrument ID: NT4

Cont. Calib. Date: 08/08/13

Init. Calib. Date: 08/06/13

Cont. Calib. Time: 1207

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
=====	=====	=====	=====	=====	=====
Naphthalene	1.101	1.029	0.700	AVRG	-6.5
2-Methylnaphthalene	0.642	0.608	0.400	AVRG	-5.3
Acenaphthylene	1.543	1.741	0.900	AVRG	12.8
Acenaphthene	1.170	1.155	0.900	AVRG	-1.3
Dibenzofuran	1.699	1.699	0.800	AVRG	0.0
Fluorene	1.262	1.336	0.900	AVRG	5.9
Phenanthrene	1.188	1.114	0.700	AVRG	-6.2
Anthracene	0.999	1.087	0.700	AVRG	8.8
Fluoranthene	1.206	1.282	0.600	AVRG	6.3
Pyrene	1.161	1.121	0.600	AVRG	-3.4
Benzo(a)anthracene	1.000	1.042	0.800	AVRG	4.2
Chrysene	1.122	1.087	0.700	AVRG	-3.1
Benzo(b)fluoranthene	1.114	1.087	0.700	AVRG	-2.4
Benzo(k)fluoranthene	1.160	1.105	0.700	AVRG	-4.7
Benzo(j)fluoranthene	1.182	1.120	0.010	AVRG	-5.2
Benzo(a)pyrene	0.962	1.026	0.700	AVRG	6.6
Indeno(1,2,3-cd)pyrene	1.365	1.410	0.500	AVRG	3.3
Dibenzo(a,h)anthracene	1.128	1.221	0.400	AVRG	8.2
Benzo(g,h,i)perylene	1.244	1.255	0.500	AVRG	0.9
1-methylnaphthalene	0.606	0.563	0.010	AVRG	-7.1
Perylene	1.091	1.067	0.010	AVRG	-2.2
=====	=====	=====	=====	=====	=====
2-Methylnaphthalene-d10	0.676	0.652	0.010	AVRG	-3.6
Dibenzo(a,h)anthracene-d14	0.930	1.067	0.010	AVRG	14.7
Fluoranthene-d10	0.996	1.135	0.010	AVRG	14.0

&lt;- Exceeds QC limit of 20% D

\* RF less than minimum RF

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No: WZ47

Project: BALBOA MARINA

Ical Midpoint ID: 08061305

Ical Date: 08/06/13

Instrument ID: NT4

Cont. Cal Date: 08/08/13

	IS1 (NPT) AREA #	RT #	IS2 (ANT) AREA #	RT #	IS3 (PHN) AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	222567	4.76	136878	7.04	229051	9.08
UPPER LIMIT	445134		273756		458102	
LOWER LIMIT	111284		68439		114526	
=====	=====	=====	=====	=====	=====	=====
CCAL	201159	4.65	118637	6.92	212155	8.93
UPPER LIMIT		5.15		7.42		9.43
LOWER LIMIT		4.15		6.42		8.43
01 WZ47MBS1	186699	4.65	112989	6.91	197726	8.93
02 WZ47LCSS1	167830	4.65	110507	6.91	198923	8.93
03 LA-3	171461	4.65	113552	6.91	204936	8.93
04 AREA A COMP	165241	4.65	107645	6.91	188783	8.93
05 AREA A COMP	175086	4.65	113626	6.91	204649	8.93
06 AREA A COMP	181858	4.65	119747	6.91	213920	8.93
07 AREA B COMP	161081	4.65	105888	6.91	192744	8.93
08 AREA B TOP	169085	4.65	108490	6.91	201022	8.93
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IS1 = Naphthalene-d8  
 IS2 = Acenaphthene-d10  
 IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint  
 AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

\* Values outside of QC limits.

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No: WZ47

Project: BALBOA MARINA

Ical Midpoint ID: 08061305

Ical Date: 08/06/13

Instrument ID: NT4

Cont. Cal Date: 08/08/13

	IS4 (CRY) AREA #	RT #	IS5 (PRY) AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	239094	13.90	214111	17.75		
UPPER LIMIT	478188		428222			
LOWER LIMIT	119547		107056			
=====	=====	=====	=====	=====	=====	=====
CCAL	247766	13.69	275067	17.50		
UPPER LIMIT		14.19		18.00		
LOWER LIMIT		13.19		17.00		
01 WZ47MBS1	239896	13.69	276729	17.49		
02 WZ47LCSS1	238993	13.68	273696	17.50		
03 LA-3	259315	13.69	315998	17.50		
04 AREA A COMP	239732	13.68	285550	17.50		
05 AREA A COMP	248698	13.68	292238	17.50		
06 AREA A COMP	260956	13.68	311523	17.50		
07 AREA B COMP	225364	13.68	267230	17.49		
08 AREA B TOP	257375	13.69	326685	17.50		
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IS4 = Chrysene-d12

IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint

AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint

RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal

RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

\* Values outside of QC limits.

**Butyl Tin Analysis  
Report and Summary QC Forms**

**ARI Job ID: WZ47**



ORGANICS ANALYSIS DATA SHEET  
Tributyl Tins by Krone 1988 SIM GC/MS  
Extraction Method: SW3546  
Page 1 of 1

Sample ID: LA-3  
SAMPLE

Lab Sample ID: WZ47A  
LIMS ID: 13-15981  
Matrix: Sediment  
Data Release Authorized: *mm*  
Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

Date Extracted: 08/06/13  
Date Analyzed: 08/09/13 10:06  
Instrument/Analyst: NT12/VTS  
Silica Gel Cleanup: No

Sample Amount: 5.15 g-dry-wt  
Final Extract Volume: 0.50 mL  
Dilution Factor: 1.00  
Alumina Cleanup: Yes  
Moisture: 53.3%

CAS Number	Analyte	RL	Result	Q
36643-28-4	Tributyltin Ion	3.8	< 3.8	U
14488-53-0	Dibutyltin Ion	5.6	< 5.6	U
<b>78763-54-9</b>	<b>Butyltin Ion</b>	<b>4.0</b>	<b>2.4</b>	<b>J</b>

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	55.1%
Tripentyl Tin Chloride	65.0%

**ORGANICS ANALYSIS DATA SHEET**  
**Tributyl Tins by Krone 1988 SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area A Comp**  
**SAMPLE**

Lab Sample ID: WZ47B  
 LIMS ID: 13-15982  
 Matrix: Sediment  
 Data Release Authorized: *mw*  
 Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/09/13 10:20  
 Instrument/Analyst: NT12/VTS  
 Silica Gel Cleanup: No

Sample Amount: 5.38 g-dry-wt  
 Final Extract Volume: 0.50 mL  
 Dilution Factor: 1.00  
 Alumina Cleanup: Yes  
 Moisture: 23.4%

CAS Number	Analyte	RL	Result	Q
36643-28-4	Tributyltin Ion	3.6	< 3.6	U
14488-53-0	Dibutyltin Ion	5.4	4.9	J
78763-54-9	Butyltin Ion	3.8	2.3	J

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	47.8%
Tripropyl Tin Chloride	75.9%

**ORGANICS ANALYSIS DATA SHEET**  
**Tributyl Tins by Krone 1988 SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area B Comp**  
**SAMPLE**

Lab Sample ID: WZ47C  
 LIMS ID: 13-15983  
 Matrix: Sediment  
 Data Release Authorized: *mw*  
 Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/09/13 10:34  
 Instrument/Analyst: NT12/VTS  
 Silica Gel Cleanup: No

Sample Amount: 5.84 g-dry-wt  
 Final Extract Volume: 0.50 mL  
 Dilution Factor: 1.00  
 Alumina Cleanup: Yes  
 Moisture: 16.8%

CAS Number	Analyte	RL	Result	Q
36643-28-4	Tributyltin Ion	3.3	< 3.3	U
14488-53-0	Dibutyltin Ion	5.0	7.0	
78763-54-9	Butyltin Ion	3.5	2.0	J

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	52.4%
Triphenyl Tin Chloride	58.3%

**TBT SURROGATE RECOVERY SUMMARY**

Matrix: Sediment

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
Event: 860.0100.000

<u>Client ID</u>	<u>TPRT</u>	<u>TPNT</u>	<u>TOT OUT</u>
LA-3	55.1%	65.0%	0
Area A Comp	47.8%	75.9%	0
Area B Comp	52.4%	58.3%	0
MB-080613	65.3%	75.2%	0
LCS-080613	66.9%	82.1%	0
Area B Top	65.7%	75.1%	0
Area B Top MS	64.0%	73.3%	0
Area B Top MSD	72.5%	84.6%	0

**LCS/MB LIMITS      QC LIMITS**

(TPRT) = Tripropyl Tin Chloride      (28-106)      (32-104)  
(TPNT) = Tripentyl Tin Chloride      (35-130)      (25-140)

Prep Method: SW3546  
Analytical Method: TBT (Hexyl) Krone 1988  
Log Number Range: 13-15981 to 13-15984

**ORGANICS ANALYSIS DATA SHEET**  
**Tributyl Tins by Krone 1988 SIM GC/MS**  
 Page 1 of 1

**Sample ID: Area B Top**  
**MATRIX SPIKE**

Lab Sample ID: WZ47D  
 LIMS ID: 13-15984  
 Matrix: Sediment  
 Data Release Authorized: *[Signature]*  
 Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/31/13  
 Date Received: 07/31/13

Date Extracted MS: 08/06/13  
 Date Analyzed MS: 08/09/13 11:11  
 MSD: 08/09/13 11:25  
 Instrument/Analyst MS: NT12/VTS  
 MSD: NT12/VTS  
 Silica Gel Cleanup: No

Sample Amount MS: 5.45 g-dry-wt  
 MSD: 5.45 g-dry-wt  
 Final Extract Volume MS: 0.5 mL  
 MSD: 0.5 mL  
 Dilution Factor MS: 1.00  
 MSD: 1.00  
 Alumina Cleanup: Yes  
 Moisture: 9.2%

Analyte	Sample	MS	Spike		MSD	MSD		RPD
			Added-MS	Recovery		Added-MSD	Recovery	
Tributyltin Ion	< 3.5 U	30.5	40.9	74.6%	37.4	40.9	91.4%	20.3%
Dibutyltin Ion	3.6 J	26.6	35.2	65.3%	32.4	35.2	81.8%	19.7%
Butyltin Ion	2.0 J	17.7	28.6	54.9%	23.5	28.6	75.2%	28.2%

Results reported in µg/kg  
 RPD calculated using sample concentrations per SW846.

**ORGANICS ANALYSIS DATA SHEET**  
**Tributyl Tins by Krone 1988 SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area B Top**  
**MATRIX SPIKE**

Lab Sample ID: WZ47D  
 LIMS ID: 13-15984  
 Matrix: Sediment  
 Data Release Authorized: *mw*  
 Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/31/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/09/13 11:11  
 Instrument/Analyst: NT12/VTS  
 Silica Gel Cleanup: No

Sample Amount: 5.45 g-dry-wt  
 Final Extract Volume: 0.50 mL  
 Dilution Factor: 1.00  
 Alumina Cleanup: Yes  
 Moisture: 9.2%

CAS Number	Analyte	RL	Result	Q
36643-28-4	Tributyltin Ion	3.6	---	
14488-53-0	Dibutyltin Ion	5.3	---	
78763-54-9	Butyltin Ion	3.7	---	

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	64.0%
Tripropyl Tin Chloride	73.3%

**ORGANICS ANALYSIS DATA SHEET**  
**Tributyl Tins by Krone 1988 SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: Area B Top**  
**MATRIX SPIKE DUP**

Lab Sample ID: WZ47D  
 LIMS ID: 13-15984  
 Matrix: Sediment  
 Data Release Authorized: *MW*  
 Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: 07/31/13  
 Date Received: 07/31/13

Date Extracted: 08/06/13  
 Date Analyzed: 08/09/13 11:25  
 Instrument/Analyst: NT12/VTS  
 Silica Gel Cleanup: No

Sample Amount: 5.45 g-dry-wt  
 Final Extract Volume: 0.50 mL  
 Dilution Factor: 1.00  
 Alumina Cleanup: Yes  
 Moisture: 9.2%

CAS Number	Analyte	RL	Result	Q
36643-28-4	Tributyltin Ion	3.6	---	
14488-53-0	Dibutyltin Ion	5.3	---	
78763-54-9	Butyltin Ion	3.7	---	


Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	72.5%
Tripropyl Tin Chloride	84.6%

**ORGANICS ANALYSIS DATA SHEET**  
**Tributyl Tins by Krone 1988 SIM GC/MS**  
 Page 1 of 1

**Sample ID: LCS-080613**  
**LAB CONTROL SAMPLE**

Lab Sample ID: LCS-080613  
 LIMS ID: 13-15984  
 Matrix: Sediment  
 Data Release Authorized:   
 Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: NA  
 Date Received: NA

Date Extracted LCS: 08/06/13  
 Date Analyzed LCS: 08/09/13 09:52  
 Instrument/Analyst LCS: NT12/VTS  
 Silica Gel Cleanup: No

Sample Amount LCS: 5.00 g-dry-wt  
 Final Extract Volume LCS: 0.50 mL  
 Dilution Factor LCS: 1.00  
 Alumina Cleanup: Yes

Analyte	LCS	Spike Added	Recovery
Tributyltin Ion	35.7	44.6	80.0%
Dibutyltin Ion	27.9	38.4	72.7%
Butyltin Ion	17.1	31.2	54.8%

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	66.9%
Tripropyl Tin Chloride	82.1%



4B  
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

WZ47MBS1

Lab Name: ANALYTICAL RESOURCES INC  
ARI Job No: WZ47  
Lab File ID: WZ47MB  
Instrument ID: NT12  
Matrix: SOLID

Client: NEWFIELDS NORTHWEST  
Project: BALBOA MARINA  
Date Extracted: 08/06/13  
Date Analyzed: 08/09/13  
Time Analyzed: 0938

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	WZ47LCSS1	WZ47LCSS1	WZ47SB	08/09/13
02	LA-3	WZ47A	WZ47A	08/09/13
03	AREA A COMP	WZ47B	WZ47B	08/09/13
04	AREA B COMP	WZ47C	WZ47C	08/09/13
05	AREA B TOP	WZ47D	WZ47D	08/09/13
06	AREA B TOP MS	WZ47DMS	WZ47DMS	08/09/13
07	AREA B TOP MSD	WZ47DMSD	WZ47DMSD	08/09/13
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29				
30				

**ORGANICS ANALYSIS DATA SHEET**  
**Tributyl Tins by Krone 1988 SIM GC/MS**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: MB-080613**  
**METHOD BLANK**

Lab Sample ID: MB-080613  
 LIMS ID: 13-15984  
 Matrix: Sediment  
 Data Release Authorized: *mw*  
 Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 Event: 860.0100.000  
 Date Sampled: NA  
 Date Received: NA

Date Extracted: 08/06/13  
 Date Analyzed: 08/09/13 09:38  
 Instrument/Analyst: NT12/VTS  
 Silica Gel Cleanup: No

Sample Amount: 5.00 g-dry-wt  
 Final Extract Volume: 0.50 mL  
 Dilution Factor: 1.00  
 Alumina Cleanup: Yes

CAS Number	Analyte	RL	Result	Q
36643-28-4	Tributyltin Ion	3.9	< 3.9	U
14488-53-0	Dibutyltin Ion	5.8	< 5.8	U
78763-54-9	Butyltin Ion	4.1	< 4.1	U

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	65.3%
Tripenyl Tin Chloride	75.2%

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

Instrument ID: NT12

Project: BALBOA MARINA

DFTPP Injection Date: 05/03/13

DFTPP Injection Time: 1509

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	29.3
68	Less than 2.0% of mass 69	0.3 ( 0.5)1
69	Mass 69 relative abundance	72.3
70	Less than 2.0% of mass 69	0.3 ( 0.5)1
127	10.0 - 80.0% of mass 198	66.0
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	8.1
275	10.0 - 60.0% of mass 198	28.1
365	Greater than 1.0% of mass 198	3.73
441	0.0 - 24.0% of mass 442	13.7 ( 16.6)2
442	50.0 - 200.0% of mass 198	82.4
443	15.0 - 24.0% of mass 442	18.3 ( 22.2)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		TBT 1	CC0503	05/03/13	1522
02		TBT 4	IC0503B	05/03/13	1538
03		TBT .05	IC0503C	05/03/13	1552
04		TBT 2	IC0503D	05/03/13	1606
05		TBT .2	IC0503E	05/03/13	1620
06		TBT .5	IC0503F	05/03/13	1633
07					
08					
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22					

5B  
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

Instrument ID: NT12

Project: BALBOA MARINA

DFTPP Injection Date: 08/09/13

DFTPP Injection Time: 0847

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	26.8
68	Less than 2.0% of mass 69	0.2 ( 0.3)1
69	Mass 69 relative abundance	69.3
70	Less than 2.0% of mass 69	0.4 ( 0.6)1
127	10.0 - 80.0% of mass 198	62.9
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	8.1
275	10.0 - 60.0% of mass 198	29.1
365	Greater than 1.0% of mass 198	4.13
441	0.0 - 24.0% of mass 442	13.9 ( 16.5)2
442	50.0 - 200.0% of mass 198	83.9
443	15.0 - 24.0% of mass 442	18.3 ( 21.8)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC0809	CC0809	08/09/13	0900
02	WZ47MBS1	WZ47MB	08/09/13	0938
03	WZ47LCSS1	WZ47SB	08/09/13	0952
04	LA-3	WZ47A	08/09/13	1006
05	AREA A COMP	WZ47B	08/09/13	1020
06	AREA B COMP	WZ47C	08/09/13	1034
07	AREA B TOP	WZ47D	08/09/13	1057
08	AREA B TOP MS	WZ47DMS	08/09/13	1111
09	AREA B TOP MSD	WZ47DMSD	08/09/13	1125
10				
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## SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No: WZ47

Project: BALBOA MARINA

Instrument ID: NT12

Cont. Calib. Date: 08/09/13

Init. Calib. Date: 05/03/13

Cont. Calib. Time: 0900

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Tributyl Tin (Hexyl)	0.704	0.713	0.010	AVRG	1.3
Dibutyl Tin (Hexyl)	0.042	0.038	0.010	AVRG	-9.5
Butyl Tin (Hexyl)	0.060	0.058	0.010	AVRG	-3.3
Tetrabutyl Tin	0.918	0.911	0.010	AVRG	-0.8
Tripropyl Tin (Hexyl)	0.936	0.883	0.010	AVRG	-5.7
Tripentyl Tin (Hexyl)	0.056	0.053	0.010	AVRG	-5.4

&lt;- Exceeds QC limit of 20% D

\* RF less than minimum RF

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No: WZ47

Project: BALBOA MARINA

Ical Midpoint ID: CC0503

Ical Date: 05/03/13

Instrument ID: NT12

Cont. Cal Date: 08/09/13

	IS1 AREA #	RT #	IS2 AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	303945	7.65	368324	8.61		
UPPER LIMIT	607890		736648			
LOWER LIMIT	151972		184162			
=====	=====	=====	=====	=====	=====	=====
CCAL	328146	7.88	411865	8.86		
UPPER LIMIT		8.38		9.36		
LOWER LIMIT		7.38		8.36		
01 WZ47MBS1	275653	7.87	356324	8.87		
02 WZ47LCSS1	277518	7.88	335531	8.86		
03 LA-3	282816	7.87	342021	8.86		
04 AREA A COMP	253015	7.87	235513	8.85		
05 AREA B COMP	253282	7.84	334386	8.82		
06 AREA B TOP	285060	7.89	344042	8.90		
07 AREA B TOP M	279428	7.91	345839	8.90		
08 AREA B TOP M	276487	7.91	339151	8.90		
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

IS1 = Tetrapentyl Tin

IS2 = p-Terphenyl-d14

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint  
 AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

\* Values outside of QC limits.

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**Pesticide Analysis  
Report and Summary QC Forms**

**ARI Job ID: WZ47**



**ORGANICS ANALYSIS DATA SHEET**  
**PSDDA Pesticides/PCB by GC/ECD**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: LA-3**  
**SAMPLE**

Lab Sample ID: WZ47A  
 LIMS ID: 13-15981  
 Matrix: Sediment  
 Data Release Authorized: *mmw*  
 Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/05/13  
 Date Analyzed: 08/09/13 18:50  
 Instrument/Analyst: ECD6/YZ  
 GPC Cleanup: No  
 Sulfur Cleanup: Yes  
 Florisil Cleanup: No  
 Acid Cleanup: No

Sample Amount: 12.6 g-dry-wt  
 Final Extract Volume: 2.5 mL  
 Dilution Factor: 5.00  
 Silica Gel: Yes  
 Percent Moisture: 53.3%

CAS Number	Analyte	RL	Result
319-84-6	alpha-BHC	2.5	< 2.5 U
319-85-7	beta-BHC	14	< 14 Y
319-86-8	delta-BHC	2.5	< 2.5 U
58-89-9	gamma-BHC (Lindane)	2.5	< 2.5 U
76-44-8	Heptachlor	11	< 11 Y
309-00-2	Aldrin	2.5	< 2.5 U
1024-57-3	Heptachlor Epoxide	4.9	< 4.9 U
959-98-8	Endosulfan I	2.5	< 2.5 U
60-57-1	Dieldrin	4.9	< 4.9 U
<b>72-55-9</b>	<b>4,4'-DDE</b>	<b>4.9</b>	<b>18</b>
72-20-8	Endrin	4.9	< 4.9 U
33213-65-9	Endosulfan II	4.9	< 4.9 U
72-54-8	4,4'-DDD	4.9	< 4.9 U
1031-07-8	Endosulfan Sulfate	4.9	< 4.9 U
<b>50-29-3</b>	<b>4,4'-DDT</b>	<b>4.9</b>	<b>3.4 J</b>
72-43-5	Methoxychlor	25	< 25 U
7421-93-4	Endrin Aldehyde	4.9	< 4.9 U
5103-74-2	trans-Chlordane #	2.5	< 2.5 U
5103-71-9	cis-Chlordane \$	2.5	< 2.5 U
8001-35-2	Toxaphene	490	< 490 U
789-02-6	2,4'-DDT	4.9	< 4.9 U
3424-82-6	2,4'-DDE	4.9	< 4.9 U
53-19-0	2,4'-DDD	4.9	< 4.9 U
27304-13-8	oxy Chlordane	4.9	< 4.9 U
5103-73-1	cis-Nonachlor	4.9	< 4.9 U
39765-80-5	trans-Nonachlor	4.9	< 4.9 U

Reported in µg/kg (ppb)

**Pest/PCB Surrogate Recovery**

Decachlorobiphenyl	106%
Tetrachlorometaxylene	106%

# This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

\$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ORGANICS ANALYSIS DATA SHEET  
PSDDA Pesticides/PCB by GC/ECD  
Extraction Method: SW3546  
Page 1 of 1

Sample ID: Area A Comp  
SAMPLE

Lab Sample ID: WZ47B  
LIMS ID: 13-15982  
Matrix: Sediment  
Data Release Authorized: *mmw*  
Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

Date Extracted: 08/05/13  
Date Analyzed: 08/09/13 19:43  
Instrument/Analyst: ECD6/YZ  
GPC Cleanup: No  
Sulfur Cleanup: Yes  
Florisil Cleanup: No  
Acid Cleanup: No

Sample Amount: 13.1 g-dry-wt  
Final Extract Volume: 2.5 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: 23.4%

CAS Number	Analyte	RL	Result
319-84-6	alpha-BHC	0.48	< 0.48 U
319-85-7	beta-BHC	3.6	< 3.6 Y
319-86-8	delta-BHC	0.48	< 0.48 U
58-89-9	gamma-BHC (Lindane)	0.48	< 0.48 U
76-44-8	Heptachlor	0.48	< 0.48 U
309-00-2	Aldrin	0.48	< 0.48 U
1024-57-3	Heptachlor Epoxide	1.5	< 1.5 Y
959-98-8	Endosulfan I	0.48	< 0.48 U
60-57-1	Dieldrin	0.96	< 0.96 U
<b>72-55-9</b>	<b>4,4'-DDE</b>	<b>0.96</b>	<b>16 P</b>
72-20-8	Endrin	0.96	< 0.96 U
33213-65-9	Endosulfan II	0.96	< 0.96 U
<b>72-54-8</b>	<b>4,4'-DDD</b>	<b>0.96</b>	<b>4.0</b>
1031-07-8	Endosulfan Sulfate	0.96	< 0.96 U
50-29-3	4,4'-DDT	0.96	< 0.96 U
72-43-5	Methoxychlor	4.8	< 4.8 U
7421-93-4	Endrin Aldehyde	0.96	< 0.96 U
5103-74-2	trans-Chlordane #	0.98	< 0.98 Y
5103-71-9	cis-Chlordane \$	0.48	< 0.48 U
8001-35-2	Toxaphene	96	< 96 U
789-02-6	2,4'-DDT	0.96	< 0.96 U
3424-82-6	2,4'-DDE	2.3	< 2.3 Y
53-19-0	2,4'-DDD	0.96	< 0.96 U
27304-13-8	oxy Chlordane	0.96	< 0.96 U
5103-73-1	cis-Nonachlor	0.96	< 0.96 U
39765-80-5	trans-Nonachlor	0.96	< 0.96 U

Reported in µg/kg (ppb)

**Pest/PCB Surrogate Recovery**

Decachlorobiphenyl	99.8%
Tetrachlorometaxylene	80.8%

# This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

\$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ORGANICS ANALYSIS DATA SHEET  
PSDDA Pesticides/PCB by GC/ECD  
Extraction Method: SW3546  
Page 1 of 1

Sample ID: Area B Comp  
SAMPLE

Lab Sample ID: WZ47C  
LIMS ID: 13-15983  
Matrix: Sediment  
Data Release Authorized: *mw*  
Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

Date Extracted: 08/05/13  
Date Analyzed: 08/09/13 20:01  
Instrument/Analyst: ECD6/YZ  
GPC Cleanup: No  
Sulfur Cleanup: Yes  
Florisil Cleanup: No  
Acid Cleanup: No

Sample Amount: 13.3 g-dry-wt  
Final Extract Volume: 2.5 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: 16.8%

CAS Number	Analyte	RL	Result
319-84-6	alpha-BHC	0.47	< 0.47 U
319-85-7	beta-BHC	0.47	< 0.47 U
319-86-8	delta-BHC	0.47	< 0.47 U
58-89-9	gamma-BHC (Lindane)	0.47	< 0.47 U
76-44-8	Heptachlor	0.47	< 0.47 U
309-00-2	Aldrin	0.47	< 0.47 U
1024-57-3	Heptachlor Epoxide	0.94	< 0.94 U
959-98-8	Endosulfan I	0.47	< 0.47 U
60-57-1	Dieldrin	0.94	< 0.94 U
<b>72-55-9</b>	<b>4,4'-DDE</b>	<b>0.94</b>	<b>4.2 P</b>
72-20-8	Endrin	0.94	< 0.94 U
33213-65-9	Endosulfan II	0.94	< 0.94 U
72-54-8	4,4'-DDD	0.94	< 0.94 U
1031-07-8	Endosulfan Sulfate	0.94	< 0.94 U
<b>50-29-3</b>	<b>4,4'-DDT</b>	<b>0.94</b>	<b>4.0</b>
72-43-5	Methoxychlor	4.7	< 4.7 U
7421-93-4	Endrin Aldehyde	0.94	< 0.94 U
<b>5103-74-2</b>	<b>trans-Chlordane #</b>	<b>0.47</b>	<b>0.67</b>
5103-71-9	cis-Chlordane \$	0.47	< 0.47 U
8001-35-2	Toxaphene	94	< 94 U
789-02-6	2,4'-DDT	0.94	< 0.94 U
3424-82-6	2,4'-DDE	0.94	< 0.94 U
53-19-0	2,4'-DDD	0.94	< 0.94 U
27304-13-8	oxy Chlordane	0.94	< 0.94 U
5103-73-1	cis-Nonachlor	0.94	< 0.94 U
39765-80-5	trans-Nonachlor	0.94	< 0.94 U

Reported in µg/kg (ppb)

**Pest/PCB Surrogate Recovery**

Decachlorobiphenyl	101%
Tetrachlorometaxylene	76.5%

# This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

\$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

**SW8081 PESTICIDE SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY**

Matrix: Sediment

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000

<u>Client ID</u>	<u>DCBP</u>	<u>TCMX</u>	<u>TOT OUT</u>
MB-080513	105%	73.0%	0
LCS-080513	104%	73.0%	0
LA-3	106%	106%	0
LA-3 MS	102%	97.4%	0
LA-3 MSD	97.9%	96.1%	0
Area A Comp	99.8%	80.8%	0
Area B Comp	101%	76.5%	0
Area B Top	91.6%	78.8%	0

**LCS/MB LIMITS      QC LIMITS**

(DCBP) = Decachlorobiphenyl      (60-149)      (36-182)  
(TCMX) = Tetrachlorometaxylene      (47-124)      (34-169)

Prep Method: SW3546  
Log Number Range: 13-15981 to 13-15984

**ORGANICS ANALYSIS DATA SHEET**  
**PSDDA Pesticides/PCB by GC/ECD**  
 Page 1 of 1

**Sample ID: LA-3**  
**MS/MSD**

Lab Sample ID: WZ47A  
 LIMS ID: 13-15981  
 Matrix: Sediment  
 Data Release Authorized: *[Signature]*  
 Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted MS/MSD: 08/05/13  
 Date Analyzed MS: 08/09/13 19:07  
 MSD: 08/09/13 19:25  
 Instrument/Analyst MS: ECD6/YZ  
 MSD: ECD6/YZ

Sample Amount MS: 12.6 g-dry-wt  
 MSD: 12.6 g-dry-wt  
 Final Extract Volume MS: 2.5 mL  
 MSD: 2.5 mL  
 Dilution Factor MS: 5.00  
 MSD: 5.00  
 Silica Gel: Yes  
 Percent Moisture: 53.3%

GPC Cleanup: No  
 Sulfur Cleanup: Yes  
 Florisil Cleanup: No  
 Acid Cleanup: No

Analyte	Sample	MS	Spike		MS		Spike		RPD
			Added-MS	Recovery	MSD	Added-MSD	Recovery		
alpha-BHC	< 2.47	12.5 P	3.96	316%	9.12 P	3.96	230%	31.3%	
beta-BHC	< 13.9	9.22 P	3.96	233%	7.74 P	3.96	195%	17.5%	
delta-BHC	< 2.47	5.13	3.96	130%	3.59	3.96	90.7%	35.3%	
gamma-BHC (Lindane)	< 2.47	5.56	3.96	140%	4.37	3.96	110%	24.0%	
Heptachlor	< 11.3	15.6 P	3.96	394%	15.9 P	3.96	402%	1.9%	
Aldrin	< 2.47	4.24	3.96	107%	3.59	3.96	90.7%	16.6%	
Heptachlor Epoxide	< 4.94	6.10 JP	3.96	154%	5.21	3.96	132%	15.7%	
Endosulfan I	< 2.47	3.68	3.96	92.9%	3.39	3.96	85.6%	8.2%	
Dieldrin	< 4.94	6.96	7.91	88.0%	5.88	7.91	74.3%	16.8%	
4,4'-DDE	18.0	31.4	7.91	169%	25.6	7.91	96.1%	20.4%	
Endrin	< 4.94	9.69	7.91	123%	8.16	7.91	103%	17.1%	
Endosulfan II	< 4.94	8.66	7.91	109%	7.02	7.91	88.7%	20.9%	
4,4'-DDD	< 4.94	15.0	7.91	190%	13.1	7.91	166%	13.5%	
Endosulfan Sulfate	< 4.94	9.44	7.91	119%	6.44	7.91	81.4%	37.8%	
4,4'-DDT	3.38	9.17	7.91	73.2%	6.92	7.91	44.8%	28.0%	
Methoxychlor	< 24.7	41.2	39.6	104%	31.1	39.6	78.5%	27.9%	
Endrin Aldehyde	< 4.94	5.00 J	7.91	63.2%	3.60 J	7.91	45.5%	32.6%	
trans-Chlordane	< 2.47	6.41 P	3.96	162%	9.34 P	3.96	236%	37.2%	
cis-Chlordane	< 2.47	7.72 P	3.96	195%	7.38 P	3.96	186%	4.5%	

Reported in µg/kg (ppb)  
 RPD calculated using sample concentrations per SW846.

**ORGANICS ANALYSIS DATA SHEET**  
**PSDDA Pesticides/PCB by GC/ECD**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: LA-3**  
**MATRIX SPIKE**

Lab Sample ID: WZ47A  
 LIMS ID: 13-15981  
 Matrix: Sediment  
 Data Release Authorized: *MW*  
 Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/05/13  
 Date Analyzed: 08/09/13 19:07  
 Instrument/Analyst: ECD6/YZ  
 GPC Cleanup: No  
 Sulfur Cleanup: Yes  
 Florisil Cleanup: No  
 Acid Cleanup: No

Sample Amount: 12.6 g-dry-wt  
 Final Extract Volume: 2.5 mL  
 Dilution Factor: 5.00  
 Silica Gel: Yes  
 Percent Moisture: 53.3%

CAS Number	Analyte	RL	Result
319-84-6	alpha-BHC	2.5	---
319-85-7	beta-BHC	2.5	---
319-86-8	delta-BHC	2.5	---
58-89-9	gamma-BHC (Lindane)	2.5	---
76-44-8	Heptachlor	2.5	---
309-00-2	Aldrin	2.5	---
1024-57-3	Heptachlor Epoxide	4.9	---
959-98-8	Endosulfan I	2.5	---
60-57-1	Dieldrin	4.9	---
72-55-9	4,4'-DDE	4.9	---
72-20-8	Endrin	4.9	---
33213-65-9	Endosulfan II	4.9	---
72-54-8	4,4'-DDD	4.9	---
1031-07-8	Endosulfan Sulfate	4.9	---
50-29-3	4,4'-DDT	4.9	---
72-43-5	Methoxychlor	25	---
7421-93-4	Endrin Aldehyde	4.9	---
5103-74-2	trans-Chlordane	2.5	---
5103-71-9	cis-Chlordane	2.5	---
8001-35-2	Toxaphene	490	< 490 U
789-02-6	2,4'-DDT	4.9	< 4.9 U
3424-82-6	2,4'-DDE	4.9	< 4.9 U
53-19-0	2,4'-DDD	4.9	< 4.9 U
27304-13-8	oxy Chlordane	4.9	< 4.9 U
5103-73-1	cis-Nonachlor	4.9	< 4.9 U
39765-80-5	trans-Nonachlor	4.9	< 4.9 U

Reported in µg/kg (ppb)

**Pest/PCB Surrogate Recovery**

Decachlorobiphenyl	102%
Tetrachlorometaxylene	97.4%

**ORGANICS ANALYSIS DATA SHEET**  
**PSDDA Pesticides/PCB by GC/ECD**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: LA-3**  
**MATRIX SPIKE DUP**

Lab Sample ID: WZ47A  
 LIMS ID: 13-15981  
 Matrix: Sediment  
 Data Release Authorized: *mmw*  
 Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/05/13  
 Date Analyzed: 08/09/13 19:25  
 Instrument/Analyst: ECD6/YZ  
 GPC Cleanup: No  
 Sulfur Cleanup: Yes  
 Florisil Cleanup: No  
 Acid Cleanup: No

Sample Amount: 12.6 g-dry-wt  
 Final Extract Volume: 2.5 mL  
 Dilution Factor: 5.00  
 Silica Gel: Yes  
 Percent Moisture: 53.3%

CAS Number	Analyte	RL	Result
319-84-6	alpha-BHC	2.5	---
319-85-7	beta-BHC	2.5	---
319-86-8	delta-BHC	2.5	---
58-89-9	gamma-BHC (Lindane)	2.5	---
76-44-8	Heptachlor	2.5	---
309-00-2	Aldrin	2.5	---
1024-57-3	Heptachlor Epoxide	4.9	---
959-98-8	Endosulfan I	2.5	---
60-57-1	Dieldrin	4.9	---
72-55-9	4,4'-DDE	4.9	---
72-20-8	Endrin	4.9	---
33213-65-9	Endosulfan II	4.9	---
72-54-8	4,4'-DDD	4.9	---
1031-07-8	Endosulfan Sulfate	4.9	---
50-29-3	4,4'-DDT	4.9	---
72-43-5	Methoxychlor	25	---
7421-93-4	Endrin Aldehyde	4.9	---
5103-74-2	trans-Chlordane	2.5	---
5103-71-9	cis-Chlordane	2.5	---
8001-35-2	Toxaphene	490	< 490 U
789-02-6	2,4'-DDT	4.9	< 4.9 U
3424-82-6	2,4'-DDE	4.9	< 4.9 U
53-19-0	2,4'-DDD	4.9	< 4.9 U
27304-13-8	oxy Chlordane	4.9	< 4.9 U
5103-73-1	cis-Nonachlor	4.9	< 4.9 U
39765-80-5	trans-Nonachlor	4.9	< 4.9 U

Reported in µg/kg (ppb)

**Pest/PCB Surrogate Recovery**

Decachlorobiphenyl	97.9%
Tetrachlorometaxylene	96.1%

**ORGANICS ANALYSIS DATA SHEET**  
**PSDDA Pesticides/PCB by GC/ECD**  
 Page 1 of 1

Sample ID: LCS-080513  
 LAB CONTROL

Lab Sample ID: LCS-080513  
 LIMS ID: 13-15981  
 Matrix: Sediment  
 Data Release Authorized: *MW*  
 Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/05/13  
 Date Analyzed: 08/09/13 18:32  
 Instrument/Analyst: ECD6/YZ  
 GPC Cleanup: No  
 Sulfur Cleanup: Yes  
 Florisil Cleanup: No  
 Acid Cleanup: No

Sample Amount: 12.5 g-dry-wt  
 Final Extract Volume: 2.5 mL  
 Dilution Factor: 1.00  
 Silica Gel: Yes  
 Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
alpha-BHC	3.92	4.00	98.0%
beta-BHC	4.16	4.00	104%
delta-BHC	4.54	4.00	114%
gamma-BHC (Lindane)	4.06	4.00	102%
Heptachlor	4.00	4.00	100%
Aldrin	4.10	4.00	102%
Heptachlor Epoxide	4.64	4.00	116%
Endosulfan I	4.62	4.00	116%
Dieldrin	9.48	8.00	118%
4,4'-DDE	10.2	8.00	128%
Endrin	8.60	8.00	108%
Endosulfan II	8.40	8.00	105%
4,4'-DDD	8.50	8.00	106%
Endosulfan Sulfate	8.98	8.00	112%
4,4'-DDT	8.20	8.00	102%
Methoxychlor	40.6	40.0	102%
Endrin Aldehyde	5.48	8.00	68.5%
trans-Chlordane	4.58	4.00	114%
cis-Chlordane	4.56	4.00	114%

**Pest/PCB Surrogate Recovery**

Decachlorobiphenyl	104%
Tetrachlorometaxylene	73.0%

Reported in µg/kg (ppb)



FORM 4  
PESTICIDE METHOD BLANK SUMMARY

BLANK NO.

WZ47MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

Lab Sample ID: WZ47MBS1

Lab File ID: 0809A013

Date Extracted: 08/05/13

Matrix: SOLID

Date Analyzed: 08/09/13

Instrument ID: ECD6

Time Analyzed: 1814

GC Columns: STX-CLP1/STX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	WZ47LCSS1	WZ47LCSS1	08/09/13
02	LA-3	WZ47A	08/09/13
03	LA-3 MS	WZ47AMS	08/09/13
04	LA-3 MSD	WZ47AMSD	08/09/13
05	AREA A COMP	WZ47B	08/09/13
06	AREA B COMP	WZ47C	08/09/13
07	AREA B TOP	WZ47D	08/09/13

ALL RUNS ARE DUAL COLUMN

**ORGANICS ANALYSIS DATA SHEET**  
**PSDDA Pesticides/PCB by GC/ECD**  
**Extraction Method: SW3546**  
 Page 1 of 1

**Sample ID: MB-080513**  
**METHOD BLANK**

Lab Sample ID: MB-080513  
 LIMS ID: 13-15981  
 Matrix: Sediment  
 Data Release Authorized: *MW*  
 Reported: 08/14/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: NA  
 Date Received: NA

Date Extracted: 08/05/13  
 Date Analyzed: 08/09/13 18:14  
 Instrument/Analyst: ECD6/YZ  
 GPC Cleanup: No  
 Sulfur Cleanup: Yes  
 Florisil Cleanup: No  
 Acid Cleanup: No

Sample Amount: 12.5 g-dry-wt  
 Final Extract Volume: 2.5 mL  
 Dilution Factor: 1.00  
 Silica Gel: Yes  
 Percent Moisture: NA

CAS Number	Analyte	RL	Result
319-84-6	alpha-BHC	0.50	< 0.50 U
319-85-7	beta-BHC	0.50	< 0.50 U
319-86-8	delta-BHC	0.50	< 0.50 U
58-89-9	gamma-BHC (Lindane)	0.50	< 0.50 U
76-44-8	Heptachlor	0.50	< 0.50 U
309-00-2	Aldrin	0.50	< 0.50 U
1024-57-3	Heptachlor Epoxide	1.0	< 1.0 U
959-98-8	Endosulfan I	0.50	< 0.50 U
60-57-1	Dieldrin	1.0	< 1.0 U
72-55-9	4,4'-DDE	1.0	< 1.0 U
72-20-8	Endrin	1.0	< 1.0 U
33213-65-9	Endosulfan II	1.0	< 1.0 U
72-54-8	4,4'-DDD	1.0	< 1.0 U
1031-07-8	Endosulfan Sulfate	1.0	< 1.0 U
50-29-3	4,4'-DDT	1.0	< 1.0 U
72-43-5	Methoxychlor	5.0	< 5.0 U
7421-93-4	Endrin Aldehyde	1.0	< 1.0 U
5103-74-2	trans-Chlordane	0.50	< 0.50 U
5103-71-9	cis-Chlordane	0.50	< 0.50 U
8001-35-2	Toxaphene	100	< 100 U
789-02-6	2,4'-DDT	1.0	< 1.0 U
3424-82-6	2,4'-DDE	1.0	< 1.0 U
53-19-0	2,4'-DDD	1.0	< 1.0 U
27304-13-8	oxy Chlordane	1.0	< 1.0 U
5103-73-1	cis-Nonachlor	1.0	< 1.0 U
39765-80-5	trans-Nonachlor	1.0	< 1.0 U

Reported in µg/kg (ppb)

**Pest/PCB Surrogate Recovery**

Decachlorobiphenyl	105%
Tetrachlorometaxylene	73.0%

6D  
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
alpha-BHC	4.28	4.28	4.28	4.28	4.28	4.28	4.28	4.28	4.23	4.33
beta-BHC	4.65	4.65	4.64	4.64	4.64	4.64	4.64	4.64	4.59	4.69
delta-BHC	4.82	4.82	4.81	4.81	4.81	4.81	4.81	4.81	4.76	4.86
gamma-BHC (Lindane)	4.57	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.51	4.61
Heptachlor	5.01	5.01	5.01	5.01	5.01	5.01	5.00	5.01	4.95	5.05
Aldrin	5.30	5.30	5.30	5.30	5.30	5.30	5.29	5.30	5.24	5.34
Heptachlor epoxide b	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.82	5.92
Endosulfan I	6.25	6.25	6.25	6.25	6.25	6.24	6.24	6.25	6.19	6.29
Dieldrin	6.47	6.47	6.47	6.47	6.47	6.47	6.46	6.47	6.41	6.51
4,4'-DDE	6.18	6.17	6.17	6.17	6.17	6.17	6.17	6.17	6.12	6.22
Endrin	6.69	6.69	6.69	6.68	6.68	6.68	6.68	6.68	6.63	6.73
Endosulfan II	6.89	6.89	6.89	6.89	6.89	6.89	6.89	6.89	6.84	6.94
4,4'-DDD	6.74	6.73	6.73	6.73	6.73	6.73	6.72	6.73	6.67	6.77
Endosulfan sulfate	7.66	7.66	7.66	7.66	7.66	7.65	7.65	7.66	7.60	7.70
4,4'-DDT	6.99	6.99	6.99	6.99	6.98	6.98	6.98	6.99	6.93	7.03
Methoxychlor	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.36	7.46
Endrin ketone	7.91	7.91	7.91	7.91	7.91	7.91	7.91	7.91	7.86	7.96
Endrin aldehyde	7.27	7.27	7.27	7.27	7.27	7.27	7.26	7.27	7.21	7.31
gamma-Chlordane	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.94	6.04
alpha-Chlordane	6.12	6.11	6.11	6.11	6.11	6.11	6.11	6.11	6.06	6.16
Hexachlorobutadiene	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.25	2.35
Hexachlorobenzene	4.14	4.14	4.14	4.14	4.14	4.14	4.13	4.14	4.08	4.18
Tetrachloro-m-xylene	3.80	3.80	3.80	3.80	3.80	3.80	3.79	3.80	3.74	3.84
Decachlorobiphenyl	8.75	8.75	8.75	8.75	8.75	8.75	8.75	8.75	8.70	8.80

6D  
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
alpha-BHC	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.66	4.76
beta-BHC	5.15	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.09	5.19
delta-BHC	5.46	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.40	5.50
gamma-BHC (Lindane)	5.07	5.07	5.07	5.07	5.07	5.07	5.06	5.07	5.01	5.11
Heptachlor	5.53	5.53	5.53	5.53	5.53	5.53	5.52	5.53	5.47	5.57
Aldrin	5.87	5.87	5.87	5.86	5.87	5.86	5.86	5.87	5.81	5.91
Heptachlor epoxide b	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.37	6.47
Endosulfan I	6.81	6.81	6.81	6.81	6.81	6.81	6.80	6.81	6.75	6.85
Dieldrin	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.01	7.11
4,4'-DDE	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.82	6.92
Endrin	7.35	7.35	7.35	7.35	7.35	7.35	7.35	7.35	7.30	7.40
Endosulfan II	7.54	7.54	7.54	7.54	7.54	7.54	7.54	7.54	7.49	7.59
4,4'-DDD	7.41	7.41	7.41	7.41	7.40	7.40	7.40	7.41	7.35	7.45
Endosulfan sulfate	8.08	8.08	8.08	8.08	8.08	8.08	8.08	8.08	8.03	8.13
4,4'-DDT	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.64	7.74
Methoxychlor	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.22	8.32
Endrin ketone	8.57	8.57	8.57	8.57	8.57	8.57	8.57	8.57	8.52	8.62
Endrin aldehyde	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.79	7.89
gamma-Chlordane	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.55	6.65
alpha-Chlordane	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.69	6.79
Hexachlorobutadiene	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.41	2.51
Hexachlorobenzene	4.59	4.59	4.59	4.59	4.59	4.59	4.58	4.59	4.53	4.63
Tetrachloro-m-xylene	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.08	4.18
Decachlorobiphenyl	9.72	9.72	9.72	9.72	9.72	9.72	9.71	9.72	9.66	9.76

6E  
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

COMPOUND	CALIBRATION FACTORS							MEAN	R <sup>2</sup>
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		
alpha-BHC	1.4329	1.4668	1.4941	1.5856	1.5998	1.6675	1.6510	1.5568	5.9
beta-BHC	0.6624	0.6515	0.6124	0.6178	0.5982	0.6036	0.5865	0.6189	4.5
delta-BHC	1.2616	1.1700	1.1853	1.3059	1.3433	1.4135	1.4153	1.2993	7.7
gamma-BHC (Lindane)	1.3482	1.3745	1.3772	1.4464	1.4444	1.4906	1.4713	1.4218	3.8
Heptachlor	1.3677	1.3694	1.3592	1.3983	1.3675	1.3758	1.3199	1.3654	1.7
Aldrin	1.3427	1.3505	1.3469	1.3977	1.3830	1.4036	1.3482	1.3675	1.9
Heptachlor epoxide b	1.2687	1.2644	1.2358	1.2652	1.2214	1.2197	1.1554	1.2329	3.2
Endosulfan I	1.2724	1.2405	1.1849	1.1778	1.1222	1.1046	1.0522	1.1649	6.6
Dieldrin	1.2203	1.2500	1.2323	1.2610	1.2227	1.2149	1.1627	1.2234	2.6
4,4'-DDE	0.9652	0.9454	0.9071	0.9186	0.9121	0.9366	0.9264	0.9302	2.2
Endrin	1.0649	1.0874	1.0675	1.1026	1.0760	1.0622	1.0324	1.0704	2.1
Endosulfan II	1.1344	1.1277	1.1037	1.1406	1.0974	1.0793	1.0453	1.1040	3.1
4,4'-DDD	1.0801	1.0967	1.0746	1.0376	1.0253	1.0440	1.0222	1.0544	2.8
Endosulfan sulfate	0.9640	0.9628	0.9393	0.9726	0.9514	0.9536	0.9355	0.9542	1.4
4,4'-DDT	1.0171	1.0390	1.0327	1.0779	1.0622	1.0736	1.0662	1.0527	2.2
Methoxychlor	0.5442	0.5347	0.5022	0.4958	0.4584	0.4615	0.4669	0.4948	7.0
Endrin ketone	1.3247	1.2976	1.2403	1.2541	1.2000	1.1925	1.1616	1.2387	4.7
Endrin aldehyde	0.9712	0.9492	0.9229	0.9381	0.8981	0.8869	0.8533	0.9171	4.4
gamma-Chlordane	1.3016	1.3015	1.2770	1.3156	1.2958	1.3224	1.2787	1.2989	1.3
alpha-Chlordane	1.2610	1.2514	1.2172	1.2492	1.2296	1.2516	1.2093	1.2385	1.6
Hexachlorobutadiene	1.7682	1.7672	1.7088	1.7198	1.6565	1.6752	1.6653	1.7087	2.7
Hexachlorobenzene	1.2880	1.3455	1.2190	1.2156	1.1641	1.1656	1.1292	1.2181	6.2
Tetrachloro-m-xylene	1.0173	1.0212	1.0128	1.0445	1.0274	1.0316	0.9995	1.0220	1.4
Decachlorobiphenyl	1.0442	1.0256	0.9800	0.9744	0.9086	0.9328	0.9114	0.9681	5.5

6E  
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

COMPOUND	CALIBRATION FACTORS							MEAN	R <sup>2</sup>
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		
alpha-BHC	1.4576	1.5789	1.5694	1.6904	1.6706	1.7099	1.6497	1.6181	5.5
beta-BHC	0.5999	0.6149	0.6102	0.6302	0.6231	0.6377	0.6143	0.6186	2.1
delta-BHC	1.1059	1.1922	1.2676	1.3972	1.4052	1.4473	1.4400	1.3222	10.2
gamma-BHC (Lindane)	1.2675	1.3492	1.3843	1.4814	1.4688	1.4956	1.4853	1.4189	6.1
Heptachlor	1.3155	1.3667	1.3678	1.4144	1.3603	1.3309	1.2306	1.3409	4.3
Aldrin	1.2960	1.2818	1.2901	1.3286	1.2887	1.2854	1.2022	1.2818	3.0
Heptachlor epoxide b	1.0710	1.1195	1.1105	1.1559	1.1202	1.1034	1.0222	1.1004	3.9
Endosulfan I	0.9717	1.0164	1.0202	1.0643	1.0317	1.0172	0.9424	1.0091	4.0
Dieldrin	1.0695	1.0982	1.0832	1.0937	1.0206	0.9787	0.8735	1.0310	7.9
4,4'-DDE	0.9911	1.0511	1.0595	1.0850	1.0265	1.0074	0.9026	1.0176	5.9
Endrin	1.5502	1.5945	1.5699	1.6194	1.5453	1.4744	1.3494	1.5290	6.0
Endosulfan II	1.7033	1.7400	1.7134	1.7628	1.6694	1.6318	1.5129	1.6762	5.0
4,4'-DDD	1.5656	1.6287	1.6222	1.6758	1.6108	1.5853	1.4950	1.5976	3.6
Endosulfan sulfate	1.3069	1.3530	1.3364	1.4134	1.3761	1.3572	1.2743	1.3453	3.4
4,4'-DDT	1.3786	1.4373	1.4357	1.5206	1.4835	1.4466	1.4537	1.4508	3.0
Methoxychlor	0.6424	0.6359	0.5967	0.5699	0.5063	0.4753	0.4024	0.5470	16.3
Endrin ketone	1.5980	1.5766	1.5283	1.5686	1.4714	1.4601	1.3776	1.5115	5.2
Endrin aldehyde	1.3837	1.3898	1.3548	1.3988	1.3332	1.3044	1.2058	1.3386	5.0
gamma-Chlordane	1.0797	1.1247	1.1287	1.1761	1.1520	1.1562	1.0930	1.1300	3.1
alpha-Chlordane	1.0040	1.0483	1.0540	1.0984	1.0708	1.0737	1.0165	1.0522	3.1
Hexachlorobutadiene	1.4211	1.4157	1.3660	1.3944	1.3356	1.3012	1.2646	1.3569	4.4
Hexachlorobenzene	1.7385	1.7870	1.6791	1.7479	1.7008	1.6915	1.6390	1.7120	2.9
Tetrachloro-m-xylene	1.1874	1.2264	1.2121	1.2347	1.1723	1.1487	0.9965	1.1683	7.0
Decachlorobiphenyl	1.4342	1.4175	1.3539	1.3567	1.2919	1.2984	1.2587	1.3445	4.9

6D  
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
Oxychlorthane	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.72	5.82
2,4-DDE	5.86	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.80	5.90
trans-Nonachlor	6.10	6.10	6.10	6.09	6.10	6.09	6.09	6.10	6.04	6.14
2,4-DDD	6.34	6.34	6.34	6.34	6.34	6.34	6.34	6.34	6.28	6.38
2,4-DDT	6.58	6.58	6.58	6.57	6.57	6.57	6.57	6.57	6.52	6.62
cis-Nonachlor	6.71	6.71	6.71	6.71	6.71	6.71	6.71	6.71	6.66	6.76
Mirex	7.58	7.58	7.58	7.58	7.58	7.58	7.58	7.58	7.53	7.63
Tetrachloro-m-xylene	3.80	3.80	3.80	3.80	3.80	3.80	3.79	3.80	3.74	3.84
Decachlorobiphenyl	8.75	8.75	8.75	8.75	8.75	8.75	8.75	8.75	8.70	8.80

FORM VI PEST-1

WZ47 : 00073

6D  
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
Oxychlorthane	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.28	6.38
2,4-DDE	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.53	6.63
trans-Nonachlor	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.63	6.73
2,4-DDD	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.01	7.11
2,4-DDT	7.35	7.35	7.35	7.35	7.35	7.35	7.35	7.35	7.30	7.40
cis-Nonachlor	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.36	7.46
Mirex	8.56	8.56	8.56	8.56	8.56	8.56	8.56	8.56	8.51	8.61
Tetrachloro-m-xylene	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.08	4.18
Decachlorobiphenyl	9.72	9.72	9.72	9.72	9.72	9.72	9.71	9.72	9.66	9.76

FORM VI PEST-1

WZ47:00074



6E  
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

COMPOUND	CALIBRATION FACTORS							MEAN	R <sup>2</sup>
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		
Oxychlorthane	1.0437	1.0650	1.0418	1.0048	1.0068	0.9831	0.9393	1.0121	4.2
2,4-DDE	0.8736	0.8777	0.8576	0.8322	0.8272	0.8005	0.7454	0.8306	5.6
trans-Nonachlor	1.2665	1.3289	1.3156	1.2641	1.2912	1.2774	1.2481	1.2845	2.3
2,4-DDD	0.7604	0.7607	0.7120	0.6932	0.6986	0.6900	0.6693	0.7120	5.0
2,4-DDT	0.8416	0.8608	0.8404	0.8257	0.8280	0.8186	0.7891	0.8292	2.7
cis-Nonachlor	1.3979	1.4414	1.4306	1.3879	1.4197	1.4153	1.3926	1.4122	1.4
Mirex	0.9326	0.9298	0.8892	0.8460	0.8351	0.8288	0.8138	0.8679	5.7
Tetrachloro-m-xylene	1.0173	1.0212	1.0128	1.0445	1.0274	1.0316	0.9995	1.0220	1.4
Decachlorobiphenyl	1.0442	1.0256	0.9800	0.9744	0.9086	0.9328	0.9114	0.9681	5.5

FORM VI PEST-2

WZ47 : 00075

6E  
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC  
 ARI Job No.: WZ47  
 GC Column: STX-CLP2 ID: 0.53 (mm)  
 Calibration Date: 08/06/13

Client: NEWFIELDS NORTHWEST  
 Project: BALBOA MARINA  
 Instrument ID: ECD6

COMPOUND	CALIBRATION FACTORS							MEAN	R <sup>2</sup>
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		
Oxychlorane	0.8495	0.9039	0.9149	0.9185	0.8904	0.8942	0.8743	0.8922	2.7
2,4-DDE	0.6792	0.7024	0.7040	0.6996	0.6676	0.6406	0.5945	0.6697	6.0
trans-Nonachlor	2.0766	2.1934	2.2200	2.1753	2.1516	2.1061	1.9390	2.1231	4.5
2,4-DDD	1.1425	1.1951	1.2004	1.1870	1.1660	1.1344	1.0567	1.1546	4.3
2,4-DDT	1.1731	1.2449	1.2654	1.2810	1.2513	1.2263	1.1460	1.2268	4.0
cis-Nonachlor	2.1096	2.2655	2.2854	2.2521	2.2144	2.1620	1.9702	2.1799	5.1
Mirex	1.1438	1.1520	1.0960	1.0401	1.0182	1.0210	0.9888	1.0657	6.1
Tetrachloro-m-xylene	1.1874	1.2264	1.2121	1.2347	1.1723	1.1487	0.9965	1.1683	7.0
Decachlorobiphenyl	1.4342	1.4175	1.3539	1.3567	1.2919	1.2984	1.2587	1.3445	4.9

6G  
8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

Toxaphene				Cal
Peak	RT	RT WIN		Factor
1	6.940	6.89-	6.99	0.0498
2	6.991	6.94-	7.04	0.0354
3	7.247	7.20-	7.30	0.0563
4	7.358	7.31-	7.41	0.0296
5	7.572	7.52-	7.62	0.0568
6	7.891	7.84-	7.94	0.0322

6G  
8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 08/06/13

Toxaphene				Cal Factor
Peak	RT	RT WIN		
1	7.285	7.23-	7.33	0.0569
2	7.610	7.56-	7.66	0.0835
3	7.840	7.79-	7.89	0.0908
4	8.307	8.26-	8.36	0.0648
5	8.346	8.30-	8.40	0.0847

7E  
8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.:

Analysis Date: 09-AUG-2013 16:09

Init. Calib. Date: 06-AUG-2013

GC Column: STX-CLP1 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.172	158487
Endrin	6.682	8976773
4,4'-DDD	6.727	540831
4,4'-DDT	6.982	8887411
Endrin ketone	7.907	461524
Endrin aldehyde	7.264	213848

DDT Percent Breakdown = 7.3 %  
((158487+540831) \* 100)/(158487+540831+8887411)

Endrin Percent Breakdown = 7.0 %  
((213848+461524) \* 100)/(213848+461524+8976773)

GC Column: STX-CLP2 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.865	836760
Endrin	7.349	34028971
4,4'-DDD	7.402	2899474
4,4'-DDT	7.689	33123164
Endrin ketone	8.569	1620078
Endrin aldehyde	7.835	1021176

DDT Percent Breakdown = 10.1 %  
((836760+2899474) \* 100)/(836760+2899474+33123164)

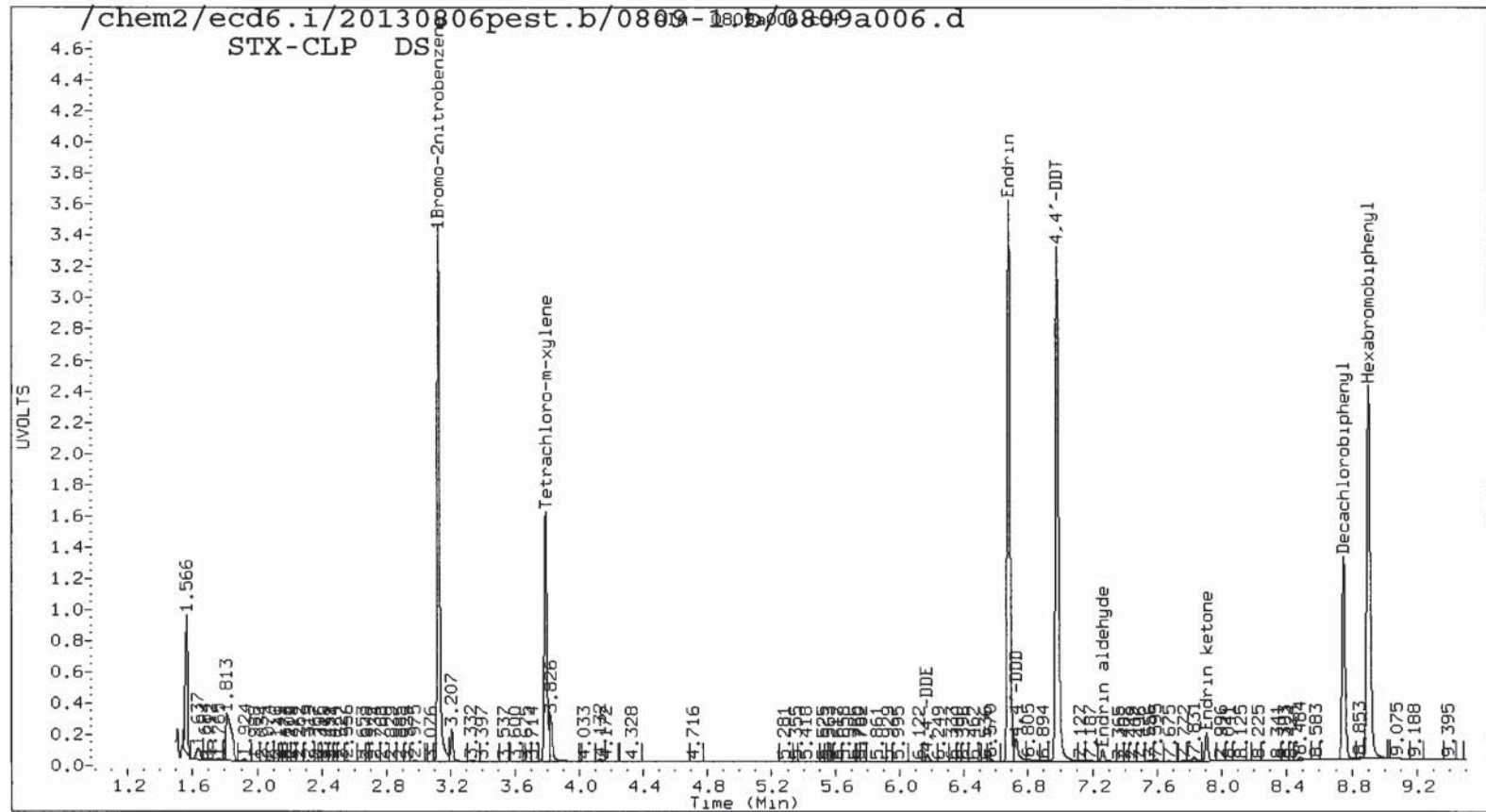
Endrin Percent Breakdown = 7.2 %  
((1021176+1620078) \* 100)/(1021176+1620078+34028971)

Form VII Pest-1

WZ47:0007S

/chem2/ecd6.i/20130806pest.b/0809-1.b/0809a006.d

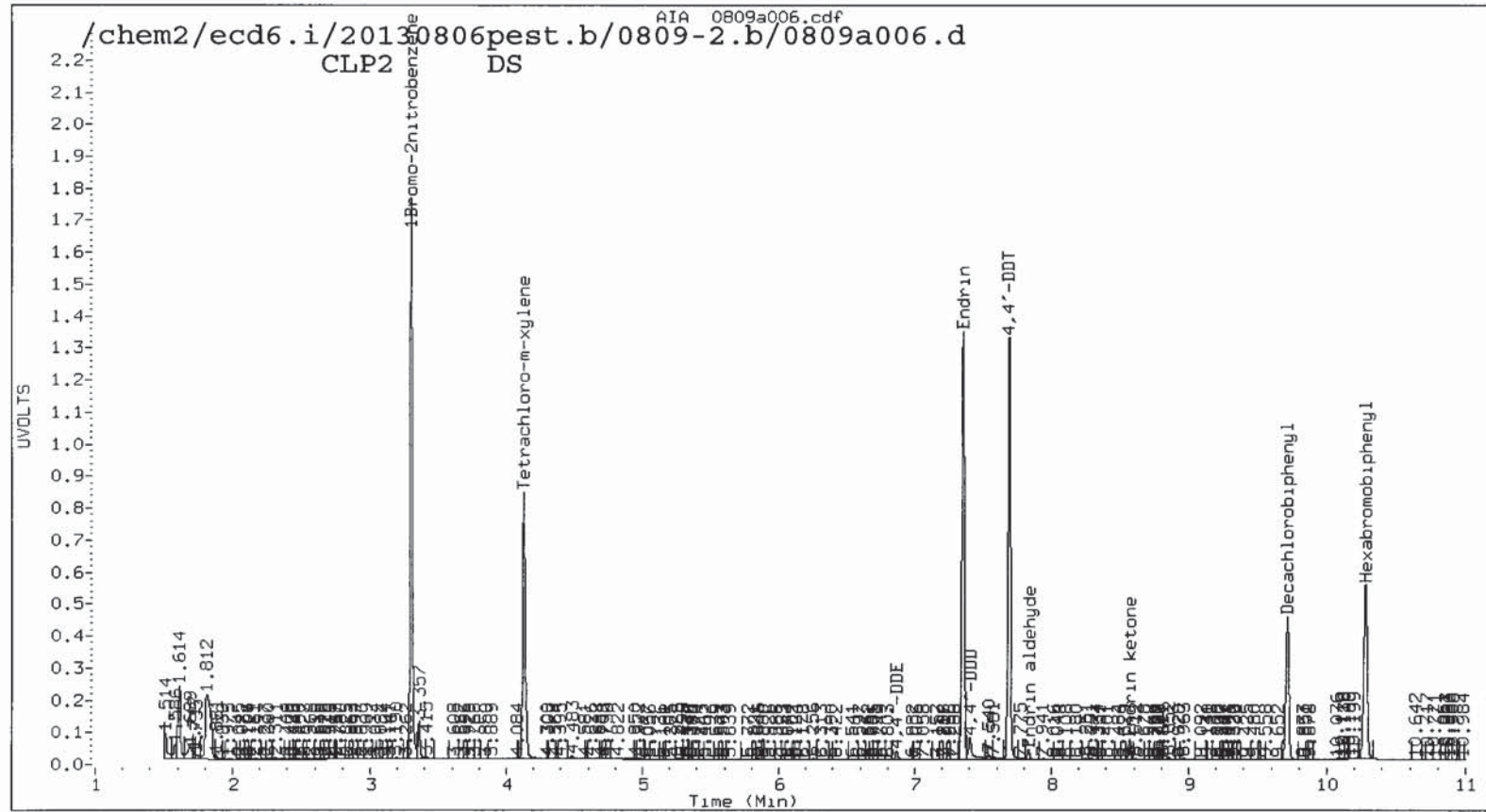
STX-CLP DS



/chem2/ecd6.i/20130806pest.b/0809-2.b/0809a006.d

CLP2 DS

AIA 0809a006.cdf



## 8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: INDAE

Date/Time Analyzed: 08/09/13,1627

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	4.71	4.66	4.76	21.7	20.0	8.7
beta-BHC	5.14	5.09	5.19	21.0	20.0	5.1
delta-BHC	5.45	5.40	5.50	22.5	20.0	12.6
gamma-BHC (Lindane)	5.06	5.01	5.11	21.8	20.0	8.9
Heptachlor	5.52	5.47	5.57	21.0	20.0	5.1
Aldrin	5.86	5.81	5.91	21.1	20.0	5.6
Heptachlor epoxide b	6.41	6.37	6.47	22.6	20.0	12.8
Endosulfan I	6.80	6.75	6.85	22.8	20.0	13.8
Dieldrin	7.06	7.01	7.11	44.5	40.0	11.4
4,4'-DDE	6.86	6.82	6.92	43.7	40.0	9.3
Endrin	7.35	7.30	7.40	41.9	40.0	4.8
Endosulfan II	7.54	7.49	7.59	42.1	40.0	5.4
4,4'-DDD	7.40	7.35	7.45	43.3	40.0	8.2
Endosulfan sulfate	8.08	8.03	8.13	42.3	40.0	5.8
4,4'-DDT	7.69	7.64	7.74	40.3	40.0	0.8
Methoxychlor	8.27	8.22	8.32	187.8	200.0	-6.1
Endrin ketone	8.57	8.52	8.62	40.2	40.0	0.6
Endrin aldehyde	7.83	7.79	7.89	40.5	40.0	1.2
gamma-Chlordane	6.60	6.55	6.65	22.7	20.0	13.5
alpha-Chlordane	6.73	6.69	6.79	22.5	20.0	12.4
Hexachlorobutadiene	2.46	2.41	2.51	18.4	20.0	-7.9
Hexachlorobenzene	4.58	4.53	4.63	20.6	20.0	2.9
Tetrachloro-m-xylene	4.13	4.08	4.18	41.3	40.0	3.1
Decachlorobiphenyl	9.71	9.66	9.76	41.1	40.0	2.6

## 8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: INDAE

Date/Time Analyzed: 08/09/13,1627

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
		FROM	TO			
alpha-BHC	4.28	4.23	4.33	21.6	20.0	7.9
beta-BHC	4.64	4.59	4.69	19.9	20.0	-0.4
delta-BHC	4.81	4.76	4.86	21.6	20.0	8.2
gamma-BHC (Lindane)	4.56	4.51	4.61	21.1	20.0	5.5
Heptachlor	5.00	4.95	5.05	20.7	20.0	3.5
Aldrin	5.29	5.24	5.34	20.9	20.0	4.4
Heptachlor epoxide b	5.87	5.82	5.92	20.7	20.0	3.3
Endosulfan I	6.24	6.19	6.29	20.1	20.0	0.3
Dieldrin	6.46	6.41	6.51	41.8	40.0	4.4
4,4'-DDE	6.17	6.12	6.22	40.3	40.0	0.7
Endrin	6.68	6.63	6.73	40.7	40.0	1.8
Endosulfan II	6.89	6.84	6.94	39.0	40.0	-2.5
4,4'-DDD	6.73	6.67	6.77	41.5	40.0	3.8
Endosulfan sulfate	7.65	7.60	7.70	40.1	40.0	0.3
4,4'-DDT	6.98	6.93	7.03	39.1	40.0	-2.2
Methoxychlor	7.41	7.36	7.46	183.5	200.0	-8.2
Endrin ketone	7.91	7.86	7.96	38.2	40.0	-4.5
Endrin aldehyde	7.26	7.21	7.31	38.3	40.0	-4.3
gamma-Chlordane	5.99	5.94	6.04	20.8	20.0	3.8
alpha-Chlordane	6.11	6.06	6.16	20.7	20.0	3.7
Hexachlorobutadiene	2.30	2.25	2.35	19.6	20.0	-2.1
Hexachlorobenzene	4.13	4.08	4.18	19.5	20.0	-2.3
Tetrachloro-m-xylene	3.79	3.74	3.84	40.3	40.0	0.6
Decachlorobiphenyl	8.75	8.70	8.80	37.8	40.0	-5.5







## 8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: TOXAPH

Date/Time Analyzed: 08/09/13,1645

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
===== Toxaphene -1	7.28	7.23	7.33	2500	2500	0.0
Toxaphene -2	7.61	7.56	7.66	2440	2500	-2.4
Toxaphene -3	7.84	7.79	7.89	2450	2500	-2.0
Toxaphene -4	8.31	8.26	8.36	2360	2500	-5.6
Toxaphene -5	8.35	8.30	8.40	2330	2500	-6.8
-----						

AVERAGE %D = 3.4

FORM VII PEST-3

WZ47:00085

## 8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: TOXAPH

Date/Time Analyzed: 08/09/13,1645

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
		FROM	TO			
===== Toxaphene -1	6.94	6.89	6.99	2480	2500	-0.8
Toxaphene -2	6.99	6.94	7.04	2510	2500	0.4
Toxaphene -3	7.25	7.20	7.30	2490	2500	-0.4
Toxaphene -4	7.36	7.31	7.41	2490	2500	-0.4
Toxaphene -5	7.57	7.52	7.62	2470	2500	-1.2
Toxaphene -6	7.89	7.84	7.94	2480	2500	-0.8

AVERAGE %D = 0.7

FORM VII PEST-3

WZ47:00086

7E  
8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.:

Analysis Date: 09-AUG-2013 20:36

Init. Calib. Date: 06-AUG-2013

GC Column: STX-CLP1 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.170	72036
Endrin	6.680	7434084
4,4'-DDD	6.725	840423
4,4'-DDT	6.979	5433488
Endrin ketone	7.905	416155
Endrin aldehyde	7.262	108457

DDT Percent Breakdown = 14.4 %  
 $((72036+840423) * 100) / (72036+840423+5433488)$

Endrin Percent Breakdown = 6.6 %  
 $((108457+416155) * 100) / (108457+416155+7434084)$

GC Column: STX-CLP2 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.863	190786
Endrin	7.347	16777427
4,4'-DDD	7.401	2384775
4,4'-DDT	7.687	12221785
Endrin ketone	8.569	1052109
Endrin aldehyde	7.833	377783

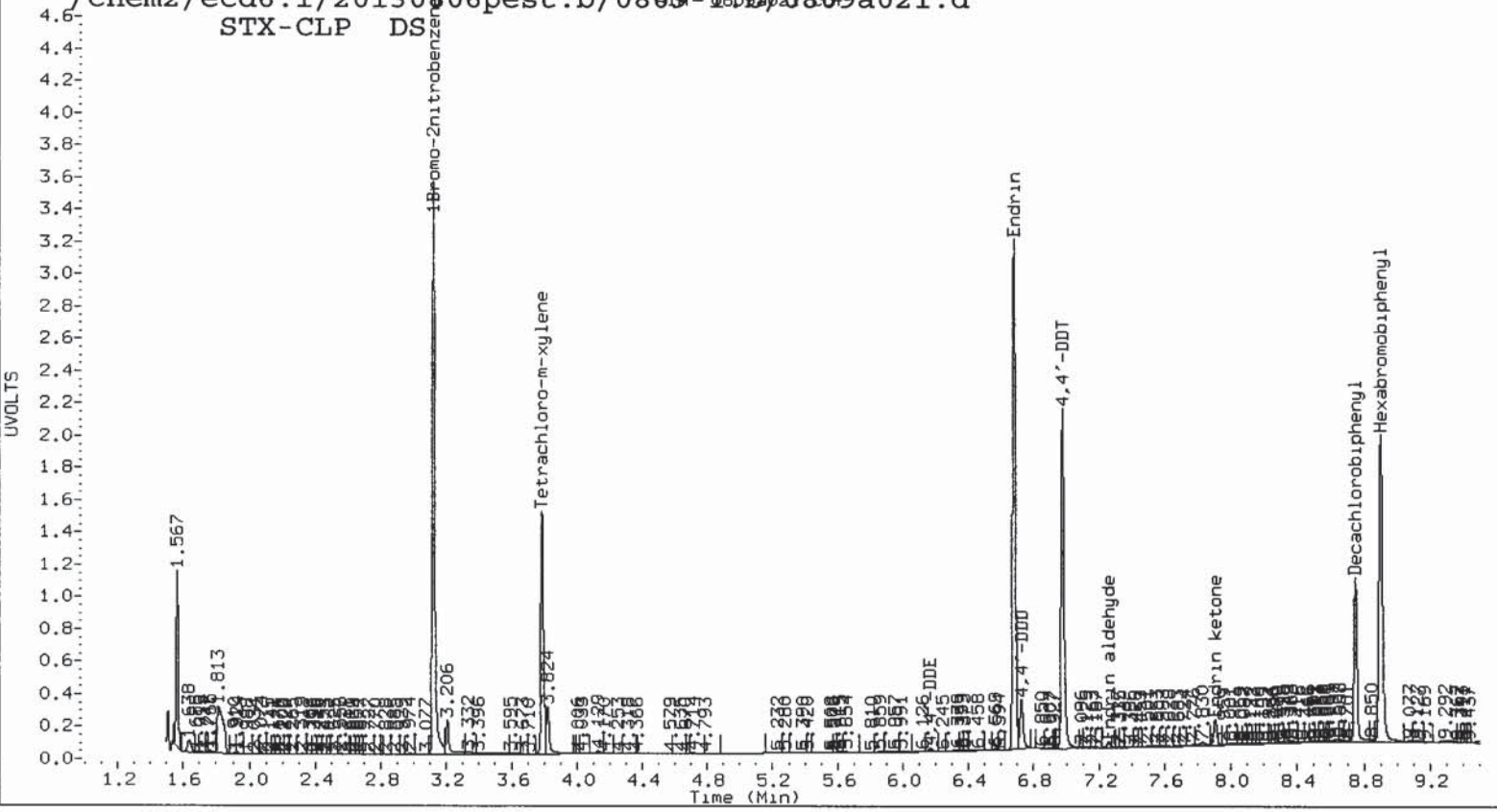
DDT Percent Breakdown = 17.4 %  
 $((190786+2384775) * 100) / (190786+2384775+12221785)$

Endrin Percent Breakdown = 7.9 %  
 $((377783+1052109) * 100) / (377783+1052109+16777427)$

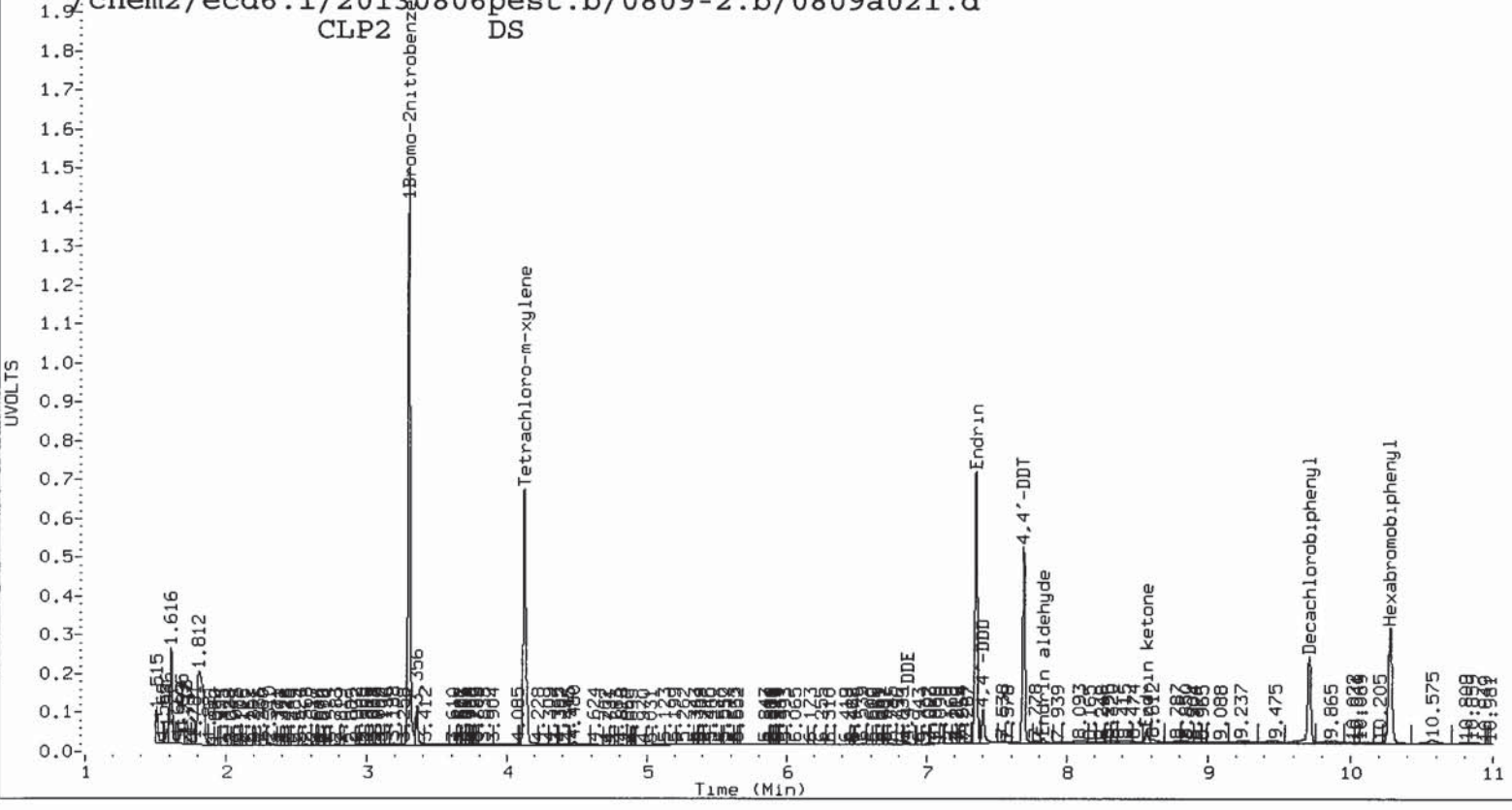
Form VII Pest-1

WZ47:00087

/chem2/ecd6.i/20130806pest.b/0809-1806/0809a021.d  
STX-CLP DS



/chem2/ecd6.i/20130806pest.b/0809-2.b/0809a021.d  
CLP2 DS



## 8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: INDAE

Date/Time Analyzed: 08/09/13,2054

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	4.70	4.66	4.76	19.1	20.0	-4.3
beta-BHC	5.13	5.09	5.19	18.0	20.0	-10.0
delta-BHC	5.44	5.40	5.50	19.2	20.0	-4.2
gamma-BHC (Lindane)	5.06	5.01	5.11	18.8	20.0	-5.9
Heptachlor	5.52	5.47	5.57	17.3	20.0	-13.2
Aldrin	5.86	5.81	5.91	16.5	20.0	-17.6
Heptachlor epoxide b	6.41	6.37	6.47	16.3	20.0	-18.6
Endosulfan I	6.80	6.75	6.85	14.0	20.0	-29.9
Dieldrin	7.06	7.01	7.11	28.7	40.0	-28.1
4,4'-DDE	6.86	6.82	6.92	27.2	40.0	-32.0
Endrin	7.35	7.30	7.40	39.3	40.0	-1.8
Endosulfan II	7.54	7.49	7.59	41.2	40.0	2.9
4,4'-DDD	7.40	7.35	7.45	44.0	40.0	9.9
Endosulfan sulfate	8.08	8.03	8.13	41.3	40.0	3.3
4,4'-DDT	7.69	7.64	7.74	29.4	40.0	-26.5
Methoxychlor	8.27	8.22	8.32	164.7	200.0	-17.6
Endrin ketone	8.57	8.52	8.62	34.2	40.0	-14.5
Endrin aldehyde	7.83	7.79	7.89	37.5	40.0	-6.2
gamma-Chlordane	6.60	6.55	6.65	15.3	20.0	-23.5
alpha-Chlordane	6.73	6.69	6.79	14.1	20.0	-29.3
Hexachlorobutadiene	2.46	2.41	2.51	17.9	20.0	-10.6
Hexachlorobenzene	4.58	4.53	4.63	17.9	20.0	-10.4
Tetrachloro-m-xylene	4.12	4.08	4.18	36.7	40.0	-8.2
Decachlorobiphenyl	9.71	9.66	9.76	39.7	40.0	-0.8

## 8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: INDAE

Date/Time Analyzed: 08/09/13,2054

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
		FROM	TO			
alpha-BHC	4.27	4.23	4.33	20.6	20.0	3.1
beta-BHC	4.63	4.59	4.69	18.3	20.0	-8.5
delta-BHC	4.80	4.76	4.86	20.2	20.0	0.8
gamma-BHC (Lindane)	4.56	4.51	4.61	19.7	20.0	-1.6
Heptachlor	5.00	4.95	5.05	18.8	20.0	-6.2
Aldrin	5.29	5.24	5.34	19.2	20.0	-3.8
Heptachlor epoxide b	5.86	5.82	5.92	18.5	20.0	-7.6
Endosulfan I	6.24	6.19	6.29	17.9	20.0	-10.5
Dieldrin	6.46	6.41	6.51	36.3	40.0	-9.2
4,4'-DDE	6.17	6.12	6.22	37.4	40.0	-6.5
Endrin	6.68	6.63	6.73	43.7	40.0	9.2
Endosulfan II	6.89	6.84	6.94	40.2	40.0	0.5
4,4'-DDD	6.72	6.67	6.77	47.6	40.0	18.9
Endosulfan sulfate	7.65	7.60	7.70	39.5	40.0	-1.3
4,4'-DDT	6.98	6.93	7.03	30.4	40.0	-24.0
Methoxychlor	7.40	7.36	7.46	162.5	200.0	-18.7
Endrin ketone	7.91	7.86	7.96	35.0	40.0	-12.5
Endrin aldehyde	7.26	7.21	7.31	38.8	40.0	-3.0
gamma-Chlordane	5.98	5.94	6.04	18.2	20.0	-9.2
alpha-Chlordane	6.11	6.06	6.16	18.0	20.0	-10.0
Hexachlorobutadiene	2.30	2.25	2.35	19.4	20.0	-2.9
Hexachlorobenzene	4.13	4.08	4.18	18.7	20.0	-6.4
Tetrachloro-m-xylene	3.79	3.74	3.84	39.7	40.0	-0.8
Decachlorobiphenyl	8.75	8.70	8.80	37.3	40.0	-6.7

&lt;-







## 8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: TOXAPH

Date/Time Analyzed: 08/09/13,2112

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
===== Toxaphene -1	7.28	7.23	7.33	2510	2500	0.4
Toxaphene -2	7.61	7.56	7.66	2420	2500	-3.2
Toxaphene -3	7.84	7.79	7.89	2140	2500	-14.4
Toxaphene -4	8.30	8.26	8.36	1730	2500	-30.8 <-
Toxaphene -5	8.34	8.30	8.40	1640	2500	-34.4 <-
-----						

AVERAGE %D = 16.6

FORM VII PEST-3

WZ47 : 00093

## 8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 08/06/13

Lab Ccal ID: TOXAPH

Date/Time Analyzed: 08/09/13,2112

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
		FROM	TO			
===== Toxaphene -1	6.94	6.89	6.99	2290	2500	-8.4
Toxaphene -2	6.99	6.94	7.04	2380	2500	-4.8
Toxaphene -3	7.24	7.20	7.30	2160	2500	-13.6
Toxaphene -4	7.36	7.31	7.41	2180	2500	-12.8
Toxaphene -5	7.57	7.52	7.62	1970	2500	-21.2 <-
Toxaphene -6	7.89	7.84	7.94	1810	2500	-27.6 <-

AVERAGE %D = 14.7

FORM VII PEST-3

WZ47: 00094

FORM 8  
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Init. Calib. Date: 08/06/13

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,  
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT
=====				=====	=====	=====	=====
ICAL MIDPT				6543663	3.125	6145816	8.908
UPPER LIMIT				13087326	3.175	12291632	8.958
LOWER LIMIT				3271832	3.075	3072908	8.858
=====				=====	=====	=====	=====
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
=====							
01	INDAE	08/06/13	1449	6543663	3.125	6145816	8.908
02	INDAA	08/06/13	1507	6716330	3.126	6353355	8.908
03	INDAB	08/06/13	1525	6761013	3.125	6361933	8.908
04	INDAC	08/06/13	1543	6654949	3.125	6280845	8.908
05	INDAD	08/06/13	1600	6555754	3.125	6135575	8.908
06	INDAF	08/06/13	1618	6566625	3.125	6215153	8.908
07	INDAG	08/06/13	1636	6550783	3.123	6120423	8.907
08	WNDE	08/06/13	1654	6469590	3.124	6085456	8.908
09	WNDA	08/06/13	1712	6566209	3.124	6205260	8.909
10	WNDB	08/06/13	1729	6434092	3.123	6045618	8.909
11	WNDC	08/06/13	1747	6381041	3.123	6053695	8.909
12	WNDD	08/06/13	1805	6387695	3.123	6149571	8.908
13	WNDF	08/06/13	1823	6297916	3.123	5987613	8.907
14	WNDG	08/06/13	1841	6201370	3.122	5887904	8.906
15	TOXAPHENE	08/06/13	1858	6548179	3.123	6422616	8.907
16	DS	08/09/13	1609	7205953	3.122	6977044	8.903
17	INDAE	08/09/13	1627	7181030	3.122	7043452	8.904
18	TOXAPH	08/09/13	1645	7126845	3.122	7095599	8.904
19	WND	08/09/13	1703	5813298	3.120	5751983	8.905
20	WZ47MBS1	08/09/13	1814	6397283	3.119	5911263	8.900
21	WZ47LCSS1	08/09/13	1832	6705047	3.119	6415014	8.900
22	LA-3	08/09/13	1850	6382063	3.119	5720349	8.897
23	LA-3 MS	08/09/13	1907	6291715	3.118	5039450	8.898
24	LA-3 MSD	08/09/13	1925	6979532	3.119	5483821	8.898
25	AREA A COMP	08/09/13	1943	5961895	3.118	4846941	8.899
26	AREA B COMP	08/09/13	2001	5373445	3.118	5073718	8.897
27	AREA B TOP	08/09/13	2019	6253697	3.120	5345445	8.899
28	DS	08/09/13	2036	7284862	3.121	5624104	8.902
29	INDAE	08/09/13	2054	7344745	3.121	5823828	8.902
30	TOXAPH	08/09/13	2112	7230155	3.120	6154379	8.902
31	WNDE	08/09/13	2130	7251719	3.120	6445601	8.902

IS1 = 1-Bromo-2-Nitrobenzene      RT Window = RT +/- .05 min  
IS2 = Hexabromobiphenyl

\* Indicates value outside QC Limits

WZ47:00095

FORM 8  
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC  
ARI Job No.: WZ47  
GC Column: STX-CLP2 ID: 0.53 (mm)  
Init. Calib. Date: 08/06/13

Client: NEWFIELDS NORTHWEST  
Project: BALBOA MARINA  
Instrument ID: ECD6

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,  
SAMPLES, AND STANDARDS IS GIVEN BELOW:

	IS1 AREA	RT	IS2 AREA	RT
ICAL MIDPT	32480641	3.300	16281238	10.280
UPPER LIMIT	64961282	3.350	32562476	10.330
LOWER LIMIT	16240320	3.250	8140619	10.230

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		INDAE	08/06/13	1449	32480641	3.300	16281238	10.280
02		INDAA	08/06/13	1507	33285043	3.301	16722696	10.279
03		INDAB	08/06/13	1525	32938676	3.300	16681138	10.280
04		INDAC	08/06/13	1543	32580583	3.300	16528373	10.280
05		INDAD	08/06/13	1600	32255555	3.299	16244730	10.280
06		INDAF	08/06/13	1618	32181454	3.300	16249363	10.279
07		INDAG	08/06/13	1636	31840350	3.297	16046830	10.279
08		WNDE	08/06/13	1654	32387396	3.298	15808947	10.279
09		WNDA	08/06/13	1712	33187310	3.299	16201723	10.279
10		WNDB	08/06/13	1729	32530095	3.297	15945266	10.281
11		WNDC	08/06/13	1747	32759740	3.298	16061354	10.280
12		WNDD	08/06/13	1805	32623400	3.297	16261404	10.279
13		WNDF	08/06/13	1823	32055300	3.297	15921548	10.279
14		WNDG	08/06/13	1841	30833839	3.296	15565243	10.278
15		TOXAPHENE	08/06/13	1858	32786474	3.297	17237151	10.279
16		DS	08/09/13	1609	35653151	3.297	18856431	10.275
17		INDAE	08/09/13	1627	36452901	3.297	19505437	10.275
18		TOXAPH	08/09/13	1645	36653792	3.297	20136441	10.275
19		WNDE	08/09/13	1703	36570277	3.296	19721180	10.276
20	WZ47MBS1	WZ47MBS1	08/09/13	1814	29143065	3.294	16636418	10.273
21	WZ47LCSS1	WZ47LCSS1	08/09/13	1832	29912604	3.293	17331024	10.272
22	LA-3	WZ47A	08/09/13	1850	27147360	3.293	11496701	10.271
23	LA-3 MS	WZ47AMS	08/09/13	1907	25257361	3.293	10175861	10.272
24	LA-3 MSD	WZ47AMSD	08/09/13	1925	26411955	3.294	10915041	10.271
25	AREA A COMP	WZ47B	08/09/13	1943	25915128	3.294	8191501	10.273
26	AREA B COMP	WZ47C	08/09/13	2001	16762865	3.293	9083538	10.272
27	AREA B TOP	WZ47D	08/09/13	2019	26844827	3.294	9180154	10.273
28		DS	08/09/13	2036	30584534	3.295	11126215	10.274
29		INDAE	08/09/13	2054	35417960	3.296	11453349	10.274
30		TOXAPH	08/09/13	2112	35194608	3.295	12546555	10.274
31		WNDE	08/09/13	2130	35246086	3.295	14299637	10.274


IS1 = 1-Bromo-2-Nitrobenzene      RT Window = RT +/- .05 min  
IS2 = Hexabromobiphenyl

\* Indicates value outside QC Limits

**PCB Congener Analysis  
Report and Summary QC Forms**

**ARI Job ID: WZ47**

Sample ID: LA-3  
 SAMPLE

Lab Sample ID: WZ47A  
 LIMS ID: 13-15981  
 Matrix: Sediment  
 Data Release Authorized:   
 Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

Date Extracted: 08/07/13  
 Date Analyzed: 08/12/13 23:31  
 Instrument/Analyst: ECD6/MDB  
 Silica Gel: No  
 Sulfur Cleanup: Yes  
 Acid Cleanup: Yes

Sample Amount: 9.84 g-dry-wt  
 Final Extract Volume: 1.0 mL  
 Dilution Factor: 1.00  
 GPC Cleanup: No  
 Percent Moisture: 53.3%

CAS Number	Analyte	RL	Result
34883-43-7	PCB #8	0.5	< 0.5 U
37680-65-2	PCB #18	0.9	< 0.9 Y
7012-37-5	PCB #28	0.5	< 0.5 U
16606-02-3	PCB #31	0.5	< 0.5 U
38444-86-9	PCB #33	0.5	< 0.5 U
41464-39-5	PCB #44	0.5	< 0.5 U
41464-40-8	PCB #49	0.5	< 0.5 U
35693-99-3	PCB #52	1.0	< 1.0 Y
41464-43-1	PCB #56	4.2	< 4.2 Y
33025-41-1	PCB #60	2.1	< 2.1 Y
<b>32598-10-0</b>	<b>PCB #66</b>	<b>0.5</b>	<b>0.6</b>
<b>32598-11-1</b>	<b>PCB #70</b>	<b>0.5</b>	<b>0.7</b>
32690-93-0	PCB #74	0.5	< 0.5 U
38380-02-8	PCB #87	0.5	< 0.5 U
38379-99-6	PCB #95	1.2	< 1.2 Y
41464-51-1	PCB #97	0.5	< 0.5 U
38380-01-7	PCB #99	0.7	< 0.7 Y
37680-73-2	PCB #101	4.2	< 4.2 Y
32598-14-4	PCB #105	0.5	< 0.5 U
<b>38380-03-9</b>	<b>PCB #110</b>	<b>0.5</b>	<b>0.7</b>
<b>31508-00-6</b>	<b>PCB #118</b>	<b>0.5</b>	<b>0.7</b>
38380-07-3	PCB #128	0.5	< 0.5 U
38380-05-1	PCB #132	1.0	< 1.0 Y
<b>35065-28-2</b>	<b>PCB #138</b>	<b>0.5</b>	<b>0.9</b>
52712-04-6	PCB #141	0.5	< 0.5 U
38380-04-0	PCB #149	0.5	< 0.5 U
52663-63-5	PCB #151	0.5	< 0.5 U
35065-27-1	PCB #153	1.0	< 1.0 Y
38380-08-4	PCB #156	0.5	< 0.5 U
74472-42-7	PCB #158	0.5	< 0.5 U
35065-30-6	PCB #170	0.5	< 0.5 U
38411-25-5	PCB #174	0.5	< 0.5 U
52663-70-4	PCB #177	0.5	< 0.5 U
35065-29-3	PCB #180	0.5	< 0.5 U
52663-69-1	PCB #183	0.5	< 0.5 U
52663-68-0	PCB #187	0.5	< 0.5 U
35694-08-7	PCB #194	0.5	< 0.5 U
52663-78-2	PCB #195	0.5	< 0.5 U



ORGANICS ANALYSIS DATA SHEET  
PCB Congeners by SW8082  
Extraction Method: SW3546  
Page 2 of 2

Sample ID: LA-3  
SAMPLE



Lab Sample ID: WZ47A  
LIMS ID: 13-15981  
Matrix: Sediment  
Data Release Authorized: *AB*  
Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

CAS Number	Analyte	RL	Result
40186-71-8	PCB #201	0.5	< 0.5 U
52663-76-0	PCB #203	0.5	< 0.5 U


Reported in  $\mu\text{g}/\text{kg}$  (ppb)

**PCB Congener Surrogate Recovery**

Decachlorobiphenyl	60.0%
Tetrachlorometaxylene	63.5%

**ORGANICS ANALYSIS DATA SHEET**  
**PCB Congeners by SW8082**  
**Extraction Method: SW3546**  
 Page 1 of 2

**Sample ID: Area A Comp**  
**SAMPLE**

Lab Sample ID: WZ47B  
 LIMS ID: 13-15982  
 Matrix: Sediment  
 Data Release Authorized:   
 Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13


Date Extracted: 08/07/13  
 Date Analyzed: 08/13/13 00:21  
 Instrument/Analyst: ECD6/JGR  
 Silica Gel: No  
 Sulfur Cleanup: Yes  
 Acid Cleanup: Yes

Sample Amount: 10.8 g-dry-wt  
 Final Extract Volume: 1.0 mL  
 Dilution Factor: 1.00  
 GPC Cleanup: No  
 Percent Moisture: 23.4%

CAS Number	Analyte	RL	Result
34883-43-7	PCB #8	0.5	< 0.5 U
<b>37680-65-2</b>	<b>PCB #18</b>	<b>0.5</b>	<b>1.4</b>
<b>7012-37-5</b>	<b>PCB #28</b>	<b>0.5</b>	<b>0.6</b>
<b>16606-02-3</b>	<b>PCB #31</b>	<b>0.5</b>	<b>0.5</b>
38444-86-9	PCB #33	0.5	< 0.5 U
<b>41464-39-5</b>	<b>PCB #44</b>	<b>0.5</b>	<b>0.7</b>
<b>41464-40-8</b>	<b>PCB #49</b>	<b>0.5</b>	<b>1.5</b>
<b>35693-99-3</b>	<b>PCB #52</b>	<b>0.5</b>	<b>2.5</b>
41464-43-1	PCB #56	0.5	< 0.5 U
33025-41-1	PCB #60	0.5	< 0.5 U
<b>32598-10-0</b>	<b>PCB #66</b>	<b>0.5</b>	<b>0.8</b>
<b>32598-11-1</b>	<b>PCB #70</b>	<b>0.5</b>	<b>1.0</b>
<b>32690-93-0</b>	<b>PCB #74</b>	<b>0.5</b>	<b>0.6</b>
38380-02-8	PCB #87	0.5	< 0.5 U
<b>38379-99-6</b>	<b>PCB #95</b>	<b>0.5</b>	<b>2.0</b>
<b>41464-51-1</b>	<b>PCB #97</b>	<b>0.5</b>	<b>0.6</b>
<b>38380-01-7</b>	<b>PCB #99</b>	<b>0.5</b>	<b>1.1</b>
<b>37680-73-2</b>	<b>PCB #101</b>	<b>0.5</b>	<b>2.4</b>
32598-14-4	PCB #105	0.5	< 0.5 U
<b>38380-03-9</b>	<b>PCB #110</b>	<b>0.5</b>	<b>0.8</b>
31508-00-6	PCB #118	1.1	< 1.1 Y
38380-07-3	PCB #128	0.5	< 0.5 U
38380-05-1	PCB #132	1.9	< 1.9 Y
<b>35065-28-2</b>	<b>PCB #138</b>	<b>0.5</b>	<b>1.8</b>
52712-04-6	PCB #141	0.5	< 0.5 U
<b>38380-04-0</b>	<b>PCB #149</b>	<b>0.5</b>	<b>1.2</b>
52663-63-5	PCB #151	0.5	< 0.5 U
35065-27-1	PCB #153	1.9	< 1.9 Y
38380-08-4	PCB #156	0.5	< 0.5 U
74472-42-7	PCB #158	0.5	< 0.5 U
35065-30-6	PCB #170	0.5	< 0.5 U
38411-25-5	PCB #174	0.5	< 0.5 U
52663-70-4	PCB #177	0.5	< 0.5 U
<b>35065-29-3</b>	<b>PCB #180</b>	<b>0.5</b>	<b>0.6</b>
52663-69-1	PCB #183	0.5	< 0.5 U
<b>52663-68-0</b>	<b>PCB #187</b>	<b>0.5</b>	<b>0.6</b>
35694-08-7	PCB #194	0.5	< 0.5 U
52663-78-2	PCB #195	0.5	< 0.5 U

**ORGANICS ANALYSIS DATA SHEET**  
**PCB Congeners by SW8082**  
**Extraction Method: SW3546**  
 Page 2 of 2

**Sample ID: Area A Comp**  
**SAMPLE**

Lab Sample ID: WZ47B  
 LIMS ID: 13-15982  
 Matrix: Sediment  
 Data Release Authorized:   
 Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/30/13  
 Date Received: 07/31/13

CAS Number	Analyte	RL	Result
40186-71-8	PCB #201	0.5	< 0.5 U
52663-76-0	PCB #203	0.5	< 0.5 U

Reported in µg/kg (ppb)


**PCB Congener Surrogate Recovery**

Decachlorobiphenyl	75.5%
Tetrachlorometaxylene	75.5%

ORGANICS ANALYSIS DATA SHEET  
PCB Congeners by SW8082  
Extraction Method: SW3546  
Page 1 of 2



Sample ID: Area B Comp  
SAMPLE

Lab Sample ID: WZ47C  
LIMS ID: 13-15983  
Matrix: Sediment  
Data Release Authorized:   
Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

Date Extracted: 08/07/13  
Date Analyzed: 08/13/13 01:11  
Instrument/Analyst: ECD6/JGR  
Silica Gel: No  
Sulfur Cleanup: Yes  
Acid Cleanup: Yes


Sample Amount: 10.9 g-dry-wt  
Final Extract Volume: 1.0 mL  
Dilution Factor: 1.00  
GPC Cleanup: No  
Percent Moisture: 16.8%

CAS Number	Analyte	RL	Result
34883-43-7	PCB #8	0.5	< 0.5 U
37680-65-2	PCB #18	0.5	< 0.5 U
7012-37-5	PCB #28	0.5	< 0.5 U
16606-02-3	PCB #31	0.5	< 0.5 U
38444-86-9	PCB #33	0.5	< 0.5 U
41464-39-5	PCB #44	0.5	< 0.5 U
41464-40-8	PCB #49	0.5	< 0.5 U
35693-99-3	PCB #52	0.5	< 0.5 U
41464-43-1	PCB #56	0.6	< 0.6 Y
33025-41-1	PCB #60	0.5	< 0.5 U
32598-10-0	PCB #66	0.5	< 0.5 U
32598-11-1	PCB #70	0.5	< 0.5 U
32690-93-0	PCB #74	0.5	< 0.5 U
38380-02-8	PCB #87	0.5	< 0.5 U
38379-99-6	PCB #95	0.5	< 0.5 U
41464-51-1	PCB #97	0.5	< 0.5 U
38380-01-7	PCB #99	0.5	< 0.5 U
37680-73-2	PCB #101	0.5	< 0.5 Y
32598-14-4	PCB #105	0.5	< 0.5 U
38380-03-9	PCB #110	0.5	< 0.5 U
31508-00-6	PCB #118	0.5	< 0.5 U
38380-07-3	PCB #128	0.5	< 0.5 U
38380-05-1	PCB #132	0.5	< 0.5 Y
35065-28-2	PCB #138	0.6	< 0.6 Y
52712-04-6	PCB #141	0.5	< 0.5 U
38380-04-0	PCB #149	0.5	< 0.5 U
52663-63-5	PCB #151	0.5	< 0.5 U
35065-27-1	PCB #153	0.5	< 0.5 U
38380-08-4	PCB #156	0.5	< 0.5 U
74472-42-7	PCB #158	0.5	< 0.5 U
35065-30-6	PCB #170	0.5	< 0.5 U
38411-25-5	PCB #174	0.5	< 0.5 U
52663-70-4	PCB #177	0.5	< 0.5 U
35065-29-3	PCB #180	0.5	< 0.5 U
52663-69-1	PCB #183	0.5	< 0.5 U
52663-68-0	PCB #187	0.5	< 0.5 U
35694-08-7	PCB #194	0.5	< 0.5 U
52663-78-2	PCB #195	0.5	< 0.5 U

ORGANICS ANALYSIS DATA SHEET  
PCB Congeners by SW8082  
Extraction Method: SW3546  
Page 2 of 2



Sample ID: Area B Comp  
SAMPLE

Lab Sample ID: WZ47C  
LIMS ID: 13-15983  
Matrix: Sediment  
Data Release Authorized:   
Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

CAS Number	Analyte	RL	Result
40186-71-8	PCB #201	0.5	< 0.5 U
52663-76-0	PCB #203	0.5	< 0.5 U

Reported in µg/kg (ppb)

**PCB Congener Surrogate Recovery**

Decachlorobiphenyl	72.2%
Tetrachlorometaxylene	59.5%

PCB CONGENERS SW8082  
 SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY



Matrix: Sediment

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000

Client ID	ARI ID	DCBP	TCMX	TOT OUT
LA-3	WZ47A	60.0%	63.5%	0
Area A Comp	WZ47B	75.5%	75.5%	0
Area B Comp	WZ47C	72.2%	59.5%	0
Method Blank	MB080713	85.8%	76.2%	0
Lab Control	LCS080713	79.5%	66.5%	0
Area B Top	WZ47D	80.8%	83.0%	0
Area B Top	WZ47DMS	87.5%	84.8%	0
Area B Top	WZ47DMSD	80.5%	78.0%	0

LCS/MB LIMITS      QC LIMITS

(DCBP) = Decachlorobiphenyl      (30-160)      (30-160)  
 (TCMX) = Tetrachlorometaxylene      (30-160)      (30-160)

Prep Method: SW3546  
 Log Number Range: 13-15981 to 13-15984

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**ORGANICS ANALYSIS DATA SHEET**

**PCB Congeners by SW8082**

Page 1 of 2

**Sample ID: LCS-080713**

**LAB CONTROL**

Lab Sample ID: LCS-080713

LIMS ID: 13-15984

Matrix: Sediment

Data Release Authorized: 

Reported: 08/20/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: NA

Date Received: NA

Date Extracted LCS: 08/07/13

Date Analyzed LCS: 08/12/13 21:51

Instrument/Analyst LCS: ECD6/JGR

Silica Gel: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount LCS: 10.0 g-dry-wt

Final Extract Volume LCS: 1.0 mL

Dilution Factor LCS: 1.00

GPC Cleanup: No

Analyte	LCS	Spike Added	Recovery
PCB #8	3.8	5.0	76.0%
PCB #18	3.5	5.0	70.0%
PCB #28	3.5	5.0	70.0%
PCB #31	4.0	5.0	80.0%
PCB #33	3.6	5.0	72.0%
PCB #44	3.7	5.0	74.0%
PCB #49	3.6	5.0	72.0%
PCB #52	3.9	5.0	78.0%
PCB #56	7.7	5.0	154%
PCB #60	4.1	5.0	82.0%
PCB #66	3.5	5.0	70.0%
PCB #70	4.1	5.0	82.0%
PCB #74	4.0	5.0	80.0%
PCB #87	3.8	5.0	76.0%
PCB #95	3.9	5.0	78.0%
PCB #97	3.9	5.0	78.0%
PCB #99	3.4	5.0	68.0%
PCB #101	4.0	5.0	80.0%
PCB #105	4.0	5.0	80.0%
PCB #110	3.9	5.0	78.0%
PCB #118	3.8	5.0	76.0%
PCB #128	3.9	5.0	78.0%
PCB #132	3.5	5.0	70.0%
PCB #138	4.1	5.0	82.0%
PCB #141	3.8	5.0	76.0%
PCB #149	3.8	5.0	76.0%
PCB #151	3.6	5.0	72.0%
PCB #153	3.4	5.0	68.0%
PCB #156	4.0	5.0	80.0%
PCB #158	3.8	5.0	76.0%
PCB #170	3.8	5.0	76.0%
PCB #174	3.9	5.0	78.0%
PCB #177	3.8	5.0	76.0%
PCB #180	3.9	5.0	78.0%
PCB #183	3.6	5.0	72.0%
PCB #187	3.8	5.0	76.0%
PCB #194	3.9	5.0	78.0%

**ORGANICS ANALYSIS DATA SHEET**

**PCB Congeners by SW8082**

Page 2 of 2

Sample ID: LCS-080713  
LAB CONTROL

Lab Sample ID: LCS-080713  
LIMS ID: 13-15984  
Matrix: Sediment  
Data Release Authorized:  
Reported: 08/20/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: NA  
Date Received: NA

Analyte	LCS	Spike Added	Recovery
PCB #195	3.9	5.0	78.0%
PCB #201	3.8	5.0	76.0%
PCB #203	3.7	5.0	74.0%

**PCB Congener Surrogate Recovery**


Decachlorobiphenyl	79.5%
Tetrachlorometaxylene	66.5%

Results reported in µg/kg (ppb)  
RPD calculated using sample concentrations per SW846.



**ORGANICS ANALYSIS DATA SHEET**  
**PCB Congeners by SW8082**  
**Extraction Method: SW3546**  
 Page 1 of 2

**Sample ID: Area B Top**  
**MATRIX SPIKE**

Lab Sample ID: WZ47D  
 LIMS ID: 13-15984  
 Matrix: Sediment  
 Data Release Authorized:   
 Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/31/13  
 Date Received: 07/31/13


Date Extracted: 08/07/13  
 Date Analyzed: 08/13/13 02:51  
 Instrument/Analyst: ECD6/JGR  
 Silica Gel: No  
 Sulfur Cleanup: Yes  
 Acid Cleanup: Yes

Sample Amount: 11.0 g-dry-wt  
 Final Extract Volume: 1.0 mL  
 Dilution Factor: 1.00  
 GPC Cleanup: No  
 Percent Moisture: 9.2%

CAS Number	Analyte	RL	Result
34883-43-7	PCB #8	0.5	---
37680-65-2	PCB #18	0.5	---
7012-37-5	PCB #28	0.5	---
16606-02-3	PCB #31	0.5	---
38444-86-9	PCB #33	0.5	---
41464-39-5	PCB #44	0.5	---
41464-40-8	PCB #49	0.5	---
35693-99-3	PCB #52	0.5	---
41464-43-1	PCB #56	0.5	---
33025-41-1	PCB #60	0.5	---
32598-10-0	PCB #66	0.5	---
32598-11-1	PCB #70	0.5	---
32690-93-0	PCB #74	0.5	---
38380-02-8	PCB #87	0.5	---
38379-99-6	PCB #95	7.0	---
41464-51-1	PCB #97	0.5	---
38380-01-7	PCB #99	0.5	---
37680-73-2	PCB #101	7.4	---
32598-14-4	PCB #105	0.5	---
38380-03-9	PCB #110	0.5	---
31508-00-6	PCB #118	0.5	---
38380-07-3	PCB #128	0.5	---
38380-05-1	PCB #132	0.5	---
35065-28-2	PCB #138	0.5	---
52712-04-6	PCB #141	0.5	---
38380-04-0	PCB #149	0.5	---
52663-63-5	PCB #151	0.5	---
35065-27-1	PCB #153	0.5	---
38380-08-4	PCB #156	0.5	---
74472-42-7	PCB #158	0.5	---
35065-30-6	PCB #170	0.5	---
38411-25-5	PCB #174	0.5	---
52663-70-4	PCB #177	0.5	---
35065-29-3	PCB #180	0.5	---
52663-69-1	PCB #183	0.5	---
52663-68-0	PCB #187	0.5	---
35694-08-7	PCB #194	0.5	---
52663-78-2	PCB #195	0.5	---

**ORGANICS ANALYSIS DATA SHEET**  
**PCB Congeners by SW8082**  
**Extraction Method: SW3546**  
 Page 2 of 2

**Sample ID: Area B Top**  
**MATRIX SPIKE**

Lab Sample ID: WZ47D  
 LIMS ID: 13-15984  
 Matrix: Sediment  
 Data Release Authorized:   
 Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
 Project: Balboa Marina  
 860.0100.000  
 Date Sampled: 07/31/13  
 Date Received: 07/31/13

CAS Number	Analyte	RL	Result
40186-71-8	PCB #201	0.5	---
52663-76-0	PCB #203	0.5	---

Reported in µg/kg (ppb)

**PCB Congener Surrogate Recovery**

Decachlorobiphenyl	87.5%
Tetrachlorometaxylene	84.8%

**ORGANICS ANALYSIS DATA SHEET  
PCB Congeners by SW8082  
Extraction Method: SW3546**


**Sample ID: Area B Top  
MATRIX SPIKE DUP**

Page 1 of 2

Lab Sample ID: WZ47D

LIMS ID: 13-15984

Matrix: Sediment

Data Release Authorized: 

Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: 07/31/13

Date Received: 07/31/13

Date Extracted: 08/07/13

Date Analyzed: 08/13/13 03:40

Instrument/Analyst: ECD6/JGR

Silica Gel: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 11.0 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1.00

GPC Cleanup: No

Percent Moisture: 9.2%

CAS Number	Analyte	RL	Result
34883-43-7	PCB #8	0.5	---
37680-65-2	PCB #18	0.5	---
7012-37-5	PCB #28	0.5	---
16606-02-3	PCB #31	0.5	---
38444-86-9	PCB #33	0.5	---
41464-39-5	PCB #44	0.5	---
41464-40-8	PCB #49	0.5	---
35693-99-3	PCB #52	0.5	---
41464-43-1	PCB #56	0.5	---
33025-41-1	PCB #60	0.5	---
32598-10-0	PCB #66	0.5	---
32598-11-1	PCB #70	0.5	---
32690-93-0	PCB #74	0.5	---
38380-02-8	PCB #87	0.5	---
38379-99-6	PCB #95	6.0	---
41464-51-1	PCB #97	0.5	---
38380-01-7	PCB #99	0.5	---
37680-73-2	PCB #101	5.4	---
32598-14-4	PCB #105	0.5	---
38380-03-9	PCB #110	0.5	---
31508-00-6	PCB #118	0.5	---
38380-07-3	PCB #128	0.5	---
38380-05-1	PCB #132	0.5	---
35065-28-2	PCB #138	0.5	---
52712-04-6	PCB #141	0.5	---
38380-04-0	PCB #149	0.5	---
52663-63-5	PCB #151	0.5	---
35065-27-1	PCB #153	0.5	---
38380-08-4	PCB #156	0.5	---
74472-42-7	PCB #158	0.5	---
35065-30-6	PCB #170	0.5	---
38411-25-5	PCB #174	0.5	---
52663-70-4	PCB #177	0.5	---
35065-29-3	PCB #180	0.5	---
52663-69-1	PCB #183	0.5	---
52663-68-0	PCB #187	0.5	---
35694-08-7	PCB #194	0.5	---
52663-78-2	PCB #195	0.5	---
40186-71-8	PCB #201	0.5	---

ORGANICS ANALYSIS DATA SHEET  
PCB Congeners by SW8082  
Extraction Method: SW3546  
Page 2 of 2



Sample ID: Area B Top  
MATRIX SPIKE DUP

Lab Sample ID: WZ47D  
LIMS ID: 13-15984  
Matrix: Sediment  
Data Release Authorized: *B*  
Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: 07/31/13  
Date Received: 07/31/13

CAS Number	Analyte	RL	Result
52663-76-0	PCB #203	0.5	---

Reported in  $\mu\text{g}/\text{kg}$  (ppb)

**PCB Congener Surrogate Recovery**

Decachlorobiphenyl	80.5%
Tetrachlorometaxylene	78.0%

**ORGANICS ANALYSIS DATA SHEET**

**PCB Congeners by SW8082**

Page 1 of 2

**Sample ID: Area B Top  
MS/MSD**

Lab Sample ID: WZ47D

LIMS ID: 13-15984

Matrix: Sediment

Data Release Authorized: *AS*

Reported: 08/20/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: 07/31/13

Date Received: 07/31/13

Date Extracted MS/MSD: 08/07/13

Sample Amount MS: 11.0 g-dry-wt

MSD: 11.0 g-dry-wt

Date Analyzed MS: 08/13/13 02:51

Final Extract Volume MS: 1.0 mL

MSD: 08/13/13 03:40

MSD: 1.0 mL

Instrument/Analyst MS: ECD6/JGR

Dilution Factor MS: 1.00

MSD: ECD6/JGR

MSD: 1.00

Silica Gel: No

GPC Cleanup: 1.00

Sulfur Cleanup: Yes

Percent Moisture: 9.2%

Acid Cleanup: Yes

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
PCB #8	< 0.5 U	3.8	4.5	84.4%	3.5	4.6	76.1%	8.2%
PCB #18	< 0.5 U	4.1	4.5	91.1%	3.6	4.6	78.3%	13.0%
PCB #28	< 0.5 U	3.4	4.5	75.6%	3.2	4.6	69.6%	6.1%
PCB #31	< 0.5 U	4.5	4.5	100%	4.2	4.6	91.3%	6.9%
PCB #33	< 0.5 U	4.3	4.5	95.6%	3.5	4.6	76.1%	20.5%
PCB #44	< 0.5 U	4.0	4.5	88.9%	3.7	4.6	80.4%	7.8%
PCB #49	< 0.5 U	3.7	4.5	82.2%	3.4	4.6	73.9%	8.5%
PCB #52	0.8	4.8	4.5	88.9%	4.4	4.6	78.3%	8.7%
PCB #56	< 0.5 U	6.6	4.5	147%	6.2	4.6	135%	6.2%
PCB #60	< 0.5 U	5.9	4.5	131%	5.3	4.6	115%	10.7%
PCB #66	< 0.5 U	3.5	4.5	77.8%	3.2	4.6	69.6%	9.0%
PCB #70	< 0.5 U	5.3	4.5	118%	4.8	4.6	104%	9.9%
PCB #74	< 0.5 U	4.4	4.5	97.8%	4.1	4.6	89.1%	7.1%
PCB #87	1.6	5.4	4.5	84.4%	4.7	4.6	67.4%	13.9%
PCB #95	< 3.2 Y	< 7.0 Y	4.5	NA	< 6.0 Y	4.6	NA	NA
PCB #97	1.0	5.0	4.5	88.9%	4.5	4.6	76.1%	10.5%
PCB #99	< 0.5 U	5.3	4.5	118%	6.7	4.6	146%	23.3%
PCB #101	< 4.1 Y	< 7.4 Y	4.5	NA	< 5.4 Y	4.6	NA	NA
PCB #105	1.4	5.9	4.5	100%	5.3	4.6	84.8%	10.7%
PCB #110	4.2	8.4	4.5	93.3%	7.1	4.6	63.0%	16.8%
PCB #118	3.0	6.6	4.5	80.0%	5.7	4.6	58.7%	14.6%
PCB #128	1.4	5.6	4.5	93.3%	5.0	4.6	78.3%	11.3%
PCB #132	1.6	5.0	4.5	75.6%	3.7	4.6	45.7%	29.9%
PCB #138	6.2	11.5	4.5	118%	9.7	4.6	76.1%	17.0%
PCB #141	1.2	5.2	4.5	88.9%	4.7	4.6	76.1%	10.1%
PCB #149	3.2	6.8	4.5	80.0%	6.1	4.6	63.0%	10.9%
PCB #151	0.8	4.6	4.5	84.4%	4.2	4.6	73.9%	9.1%
PCB #153	3.2	6.5	4.5	73.3%	4.7	4.6	32.6%	32.1%
PCB #156	0.7	4.8	4.5	91.1%	4.4	4.6	80.4%	8.7%
PCB #158	0.7	4.7	4.5	88.9%	4.3	4.6	78.3%	8.9%
PCB #170	0.8	4.8	4.5	88.9%	4.4	4.6	78.3%	8.7%
PCB #174	0.8	4.9	4.5	91.1%	4.5	4.6	80.4%	8.5%
PCB #177	< 0.5 U	4.2	4.5	93.3%	3.9	4.6	84.8%	7.4%
PCB #180	1.2	5.2	4.5	88.9%	4.8	4.6	78.3%	8.0%
PCB #183	< 0.5 U	4.4	4.5	97.8%	4.1	4.6	89.1%	7.1%
PCB #187	0.9	5.0	4.5	91.1%	4.6	4.6	80.4%	8.3%
PCB #194	< 0.5 U	4.2	4.5	93.3%	3.9	4.6	84.8%	7.4%
PCB #195	< 0.5 U	4.4	4.5	97.8%	4.0	4.6	87.0%	9.5%

ORGANICS ANALYSIS DATA SHEET

PCB Congeners by SW8082

Page 2 of 2



Sample ID: Area B Top  
MS/MSD

Lab Sample ID: WZ47D  
LIMS ID: 13-15984  
Matrix: Sediment  
Data Release Authorized:  
Reported: 08/20/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: 07/31/13  
Date Received: 07/31/13

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
PCB #201	< 0.5 U	4.3	4.5	95.6%	4.0	4.6	87.0%	7.2%
PCB #203	< 0.5 U	4.2	4.5	93.3%	3.9	4.6	84.8%	7.4%

Results reported in µg/kg (ppb)

NA-No recovery due to high concentration of analyte in original sample and/or calculated negative recovery.

RPD calculated using sample concentrations per SW846.

4  
CONGENER METHOD BLANK SUMMARY

BLANK NO.

WZ47MBS1


Lab Name: ANALYTICAL RESOURCES INC      Client: NEWFIELDS NORTHWEST  
ARI Job No.: WZ47      Project: BALBOA MARINA  
Lab Sample ID: WZ47MBS1      Lab File ID: 0812A011  
Date Extracted: 08/07/13      Matrix: SOLID  
Date Analyzed: 08/12/13      Instrument ID: ECD6  
Time Analyzed: 2102      GC Columns: CLP1/CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	WZ47LCSS1	WZ47LCSS1	08/12/13
02	LA-3	WZ47A	08/12/13
03	AREA A COMP	WZ47B	08/13/13
04	AREA B COMP	WZ47C	08/13/13
05	AREA B TOP	WZ47D	08/13/13
06	AREA B TOP MS	WZ47DMS	08/13/13
07	AREA B TOP MSD	WZ47DMSD	08/13/13

ALL RUNS ARE DUAL COLUMN

Sample ID: MB-080713  
METHOD BLANK

Lab Sample ID: MB-080713  
LIMS ID: 13-15984  
Matrix: Sediment  
Data Release Authorized:   
Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: NA  
Date Received: NA

Date Extracted: 08/07/13  
Date Analyzed: 08/12/13 21:02  
Instrument/Analyst: ECD6/JGR  
Silica Gel: No  
Sulfur Cleanup: Yes  
Acid Cleanup: Yes

Sample Amount: 10.0 g-dry-wt  
Final Extract Volume: 1.0 mL  
Dilution Factor: 1.00  
GPC Cleanup: No  
Percent Moisture: NA

CAS Number	Analyte	RL	Result
34883-43-7	PCB #8	0.5	< 0.5 U
37680-65-2	PCB #18	0.5	< 0.5 U
7012-37-5	PCB #28	0.5	< 0.5 U
16606-02-3	PCB #31	0.5	< 0.5 U
38444-86-9	PCB #33	0.5	< 0.5 U
41464-39-5	PCB #44	0.5	< 0.5 U
41464-40-8	PCB #49	0.5	< 0.5 U
35693-99-3	PCB #52	0.5	< 0.5 U
41464-43-1	PCB #56	0.5	< 0.5 U
33025-41-1	PCB #60	0.5	< 0.5 U
32598-10-0	PCB #66	0.5	< 0.5 U
32598-11-1	PCB #70	0.5	< 0.5 U
32690-93-0	PCB #74	0.5	< 0.5 U
38380-02-8	PCB #87	0.5	< 0.5 U
38379-99-6	PCB #95	0.5	< 0.5 U
41464-51-1	PCB #97	0.5	< 0.5 U
38380-01-7	PCB #99	0.5	< 0.5 U
37680-73-2	PCB #101	0.5	< 0.5 U
32598-14-4	PCB #105	0.5	< 0.5 U
38380-03-9	PCB #110	0.5	< 0.5 U
31508-00-6	PCB #118	0.5	< 0.5 U
38380-07-3	PCB #128	0.5	< 0.5 U
38380-05-1	PCB #132	0.5	< 0.5 U
35065-28-2	PCB #138	0.5	< 0.5 U
52712-04-6	PCB #141	0.5	< 0.5 U
38380-04-0	PCB #149	0.5	< 0.5 U
52663-63-5	PCB #151	0.5	< 0.5 U
35065-27-1	PCB #153	0.5	< 0.5 U
38380-08-4	PCB #156	0.5	< 0.5 U
74472-42-7	PCB #158	0.5	< 0.5 U
35065-30-6	PCB #170	0.5	< 0.5 U
38411-25-5	PCB #174	0.5	< 0.5 U
52663-70-4	PCB #177	0.5	< 0.5 U
35065-29-3	PCB #180	0.5	< 0.5 U
52663-69-1	PCB #183	0.5	< 0.5 U
52663-68-0	PCB #187	0.5	< 0.5 U
35694-08-7	PCB #194	0.5	< 0.5 U
52663-78-2	PCB #195	0.5	< 0.5 U



ORGANICS ANALYSIS DATA SHEET  
PCB Congeners by SW8082  
Extraction Method: SW3546  
Page 2 of 2



Sample ID: MB-080713  
METHOD BLANK

Lab Sample ID: MB-080713  
LIMS ID: 13-15984  
Matrix: Sediment  
Data Release Authorized: *RB*  
Reported: 08/19/13

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000  
Date Sampled: NA  
Date Received: NA

CAS Number	Analyte	RL	Result
40186-71-8	PCB #201	0.5	< 0.5 U
52663-76-0	PCB #203	0.5	< 0.5 U

Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	85.8%
Tetrachlorometaxylene	76.2%

6D  
ECD CONGENER RETENTION TIME WINDOWS

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP1 ID: 0.32 (mm)

Instrument ID: ECD6

Calibration Date: 08/12/13

COMPOUND	RT OF STANDARDS					MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		FROM	TO
BZ#5/8	9.54	9.54	9.54	9.54	9.54	9.54	9.44	9.64
BZ#18	11.01	11.00	11.01	11.00	11.00	11.00	10.91	11.11
BZ#28	13.10	13.10	13.10	13.09	13.09	13.10	13.00	13.20
BZ#31	13.01	13.01	13.01	13.01	13.01	13.01	12.91	13.11
BZ#33	13.69	13.69	13.68	13.68	13.68	13.68	13.58	13.78
BZ#44	15.71	15.71	15.70	15.70	15.70	15.70	15.60	15.80
BZ#49	14.74	14.73	14.73	14.73	14.73	14.73	14.63	14.83
BZ#52	14.63	14.63	14.63	14.63	14.63	14.63	14.53	14.73
BZ#60	18.85	18.84	18.81	18.81	18.81	18.82	18.71	18.91
BZ#66	18.07	18.06	18.03	18.03	18.03	18.04	17.93	18.13
BZ#70	17.94	17.93	17.90	17.90	17.90	17.91	17.80	18.00
BZ#74	17.48	17.47	17.44	17.44	17.44	17.45	17.34	17.54
BZ#87	20.53	20.52	20.51	20.51	20.51	20.52	20.41	20.61
BZ#95	17.69	17.69	17.69	17.69	17.69	17.69	17.59	17.79
BZ#97	20.29	20.29	20.27	20.27	20.27	20.28	20.17	20.37
BZ#99	19.29	19.29	19.28	19.27	19.27	19.28	19.18	19.38
BZ#105	24.25	24.24	24.22	24.23	24.22	24.23	24.12	24.32
BZ#110	21.21	21.20	21.19	21.19	21.19	21.20	21.09	21.29
BZ#118	22.78	22.78	22.76	22.76	22.75	22.77	22.66	22.86
BZ#128	26.88	26.88	26.86	26.86	26.86	26.87	26.76	26.96
BZ#138	25.36	25.35	25.34	25.34	25.34	25.35	25.24	25.44
BZ#141	24.52	24.52	24.51	24.51	24.51	24.51	24.41	24.61
BZ#149	22.26	22.25	22.25	22.25	22.25	22.25	22.15	22.35
BZ#151	21.48	21.48	21.47	21.47	21.47	21.47	21.37	21.57
BZ#156	28.33	28.32	28.31	28.31	28.31	28.31	28.21	28.41
BZ#158	25.46	25.46	25.45	25.45	25.45	25.45	25.35	25.55
BZ#170	30.63	30.63	30.62	30.62	30.62	30.62	30.52	30.72
BZ#174	27.37	27.37	27.36	27.36	27.36	27.36	27.26	27.46
BZ#177	27.57	27.57	27.57	27.57	27.57	27.57	27.47	27.67
BZ#180	29.13	29.13	29.13	29.12	29.12	29.12	29.03	29.23
BZ#183	26.30	26.29	26.29	26.29	26.29	26.29	26.19	26.39
BZ#187	26.05	26.04	26.04	26.04	26.04	26.04	25.94	26.14
BZ#194	34.13	34.13	34.12	34.12	34.12	34.12	34.02	34.22
BZ#195	32.62	32.62	32.62	32.62	32.62	32.62	32.52	32.72
BZ#201	30.90	30.90	30.89	30.89	30.89	30.89	30.79	30.99
BZ#203	31.10	31.09	31.09	31.09	31.09	31.09	30.99	31.19
BZ#56/101	19.09	19.09	19.07	19.07	19.07	19.08	18.97	19.17
BZ#132/153	23.80	23.79	23.78	23.78	23.78	23.79	23.68	23.88
BZ#206	35.70	35.70	35.69	35.69	35.70	35.70	35.59	35.79
TCMX (SS)	8.12	8.12	8.12	8.12	8.12	8.12	8.02	8.22

6D  
ECD CONGENER RETENTION TIME WINDOWS

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP2 ID: 0.32 (mm)

Instrument ID: ECD6

Calibration Date: 08/12/13

COMPOUND	RT OF STANDARDS					MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		FROM	TO
BZ#8	11.99	11.98	11.99	11.98	11.98	11.98	11.89	12.09
BZ#18	13.99	13.99	13.99	13.99	13.99	13.99	13.89	14.09
BZ#28	16.41	16.41	16.41	16.41	16.41	16.41	16.31	16.51
BZ#31	16.35	16.34	16.34	16.34	16.34	16.34	16.24	16.44
BZ#33	17.12	17.11	17.11	17.11	17.11	17.11	17.01	17.21
BZ#44	19.71	19.71	19.70	19.70	19.70	19.70	19.60	19.80
BZ#49	18.50	18.50	18.50	18.49	18.49	18.50	18.40	18.60
BZ#52	18.29	18.29	18.29	18.29	18.29	18.29	18.19	18.39
BZ#56/60	23.36	23.36	23.36	23.36	23.36	23.36	23.26	23.46
BZ#66/95	22.13	22.13	22.13	22.13	22.13	22.13	22.03	22.23
BZ#70	21.94	21.93	21.91	21.91	21.91	21.92	21.81	22.01
BZ#74	21.54	21.53	21.52	21.51	21.51	21.52	21.42	21.62
BZ#87	25.20	25.19	25.19	25.19	25.19	25.19	25.09	25.29
BZ#97	24.85	24.85	24.84	24.84	24.84	24.84	24.74	24.94
BZ#99	23.59	23.59	23.59	23.59	23.59	23.59	23.49	23.69
BZ#105/141	29.12	29.12	29.11	29.11	29.11	29.11	29.01	29.21
BZ#110	25.85	25.85	25.84	25.84	25.84	25.84	25.74	25.94
BZ#118	27.21	27.20	27.19	27.19	27.19	27.20	27.09	27.29
BZ#128	32.12	32.12	32.12	32.11	32.12	32.12	32.02	32.22
BZ#138/158	30.22	30.22	30.22	30.21	30.21	30.22	30.12	30.32
BZ#149	26.98	26.98	26.98	26.98	26.98	26.98	26.88	27.08
BZ#151	26.08	26.08	26.08	26.08	26.08	26.08	25.98	26.18
BZ#156	33.18	33.17	33.17	33.17	33.17	33.17	33.07	33.27
BZ#170/201	35.81	35.81	35.81	35.81	35.81	35.81	35.71	35.91
BZ#174	32.35	32.35	32.34	32.34	32.34	32.34	32.24	32.44
BZ#177	32.73	32.72	32.72	32.72	32.72	32.72	32.62	32.82
BZ#180	33.84	33.84	33.84	33.83	33.83	33.84	33.74	33.94
BZ#183	31.04	31.04	31.04	31.03	31.04	31.04	30.94	31.14
BZ#187	30.74	30.74	30.74	30.74	30.74	30.74	30.64	30.84
BZ#194	39.09	39.09	39.09	39.09	39.09	39.09	38.99	39.19
BZ#195	38.07	38.06	38.06	38.06	38.06	38.06	37.96	38.16
BZ#203	36.05	36.05	36.05	36.04	36.05	36.04	35.95	36.15
BZ#101	23.31	23.31	23.31	23.31	23.31	23.31	23.21	23.41
BZ#132	28.91	28.91	28.91	28.90	28.90	28.90	28.81	29.01
BZ#153	28.25	28.25	28.25	28.24	28.24	28.25	28.15	28.35
BZ#5	12.06	12.06	12.06	12.06	12.06	12.06	11.96	12.16
BZ#206	40.61	40.62	40.62	40.61	40.62	40.62	40.52	40.72
TCMX (SS)	9.65	9.65	9.65	9.65	9.65	9.65	9.55	9.75
DCBP (SS)	41.57	41.57	41.57	41.56	41.57	41.57	41.47	41.67

6E  
ECD CONGENER INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP1 ID: 0.32 (mm)

Instrument ID: ECD6

Calibration Date: 08/12/13

COMPOUND	CALIBRATION FACTORS					MEAN	%RSD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		
BZ#5/8	0.3015	0.2923	0.2746	0.2602	0.2470	0.2751	9.4
BZ#18	0.2578	0.2513	0.2352	0.2228	0.2118	0.2358	9.1
BZ#28	0.6864	0.6900	0.6242	0.5874	0.5474	0.6271	10.6
BZ#31	0.3130	0.3215	0.3283	0.3372	0.3327	0.3265	2.6
BZ#33	0.4213	0.4488	0.3860	0.3766	0.3569	0.3979	8.9
BZ#44	0.5516	0.5331	0.5036	0.4824	0.4605	0.5062	8.0
BZ#49	0.5482	0.5243	0.4864	0.4567	0.4331	0.4897	10.6
BZ#52	0.3478	0.3369	0.3219	0.3138	0.3019	0.3245	6.0
BZ#60	0.7290	0.7365	0.7483	0.7645	0.7588	0.7474	1.9
BZ#66	0.8098	0.7946	0.7345	0.6708	0.6407	0.7301	11.2
BZ#70	0.4872	0.4825	0.4783	0.4838	0.4776	0.4819	0.8
BZ#74	0.5512	0.5458	0.5381	0.5385	0.5254	0.5398	2.1
BZ#87	0.8694	0.8442	0.7952	0.7766	0.7531	0.8077	6.5
BZ#95	0.5986	0.5560	0.4997	0.4670	0.4421	0.5127	13.2
BZ#97	0.6098	0.5849	0.5571	0.5470	0.5309	0.5659	5.9
BZ#99	0.8258	0.7888	0.7274	0.6443	0.6312	0.7235	12.6
BZ#105	0.7653	0.7692	0.7797	0.7972	0.7725	0.7768	1.6
BZ#110	0.7334	0.7090	0.6696	0.6668	0.6527	0.6863	4.9
BZ#118	0.7449	0.7193	0.6842	0.6735	0.6454	0.6935	5.9
BZ#128	0.8822	0.8789	0.8706	0.8878	0.8499	0.8739	2.3
BZ#138	0.6125	0.6312	0.6397	0.6517	0.6308	0.6332	2.1
BZ#141	0.9097	0.9000	0.8726	0.8758	0.8342	0.8785	4.2
BZ#149	0.6825	0.6444	0.5962	0.5653	0.5374	0.6052	10.2
BZ#151	0.8102	0.7691	0.6689	0.6507	0.6447	0.7087	10.6
BZ#156	0.8880	0.9252	0.9685	0.9836	0.9578	0.9446	3.6
BZ#158	0.9982	1.0070	0.9709	0.9656	0.9207	0.9725	4.4
BZ#170	1.0772	1.0190	0.9754	0.9642	0.9311	0.9934	6.0
BZ#174	0.7695	0.7558	0.7353	0.7287	0.6971	0.7373	4.5
BZ#177	0.7831	0.7630	0.7294	0.7132	0.6783	0.7334	6.5
BZ#180	0.8782	0.8701	0.8627	0.8543	0.8230	0.8577	3.0
BZ#183	1.0063	0.8288	0.7376	0.7320	0.6938	0.7997	15.8
BZ#187	0.6829	0.6790	0.6466	0.6409	0.6080	0.6515	5.6
BZ#194	1.0651	1.0896	1.0611	1.0440	1.0125	1.0545	3.1
BZ#195	0.9659	1.0280	1.0074	0.9976	0.9700	0.9938	2.7
BZ#201	0.8737	0.8515	0.8151	0.7969	0.7637	0.8202	5.9
BZ#203	0.9823	0.9663	0.9376	0.9211	0.8893	0.9393	4.5
BZ#56/101	0.5990	0.5789	0.5554	0.5453	0.5274	0.5612	5.4
BZ#132/153	0.6307	0.6167	0.5904	0.5775	0.5466	0.5924	6.6
BZ#206	1.1992	1.1495	1.0846	1.0832	1.0536	1.1140	5.0
TCMX(SS)	0.9205	0.9271	0.9280	0.9329	0.9200	0.9257	0.9

6E  
ECD CONGENER INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP2 ID: 0.32 (mm)

Instrument ID: ECD6

Calibration Date: 08/12/13

COMPOUND	CALIBRATION FACTORS					MEAN	%RSD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		
BZ#8	0.1889	0.1901	0.1873	0.1820	0.1740	0.1845	4.9
BZ#18	0.2427	0.2393	0.2328	0.2198	0.2136	0.2296	6.3
BZ#28	0.6631	0.6700	0.6341	0.6118	0.5838	0.6326	6.9
BZ#31	0.3261	0.3379	0.3529	0.3603	0.3527	0.3460	3.6
BZ#33	0.3967	0.4116	0.3986	0.4011	0.3849	0.3986	3.4
BZ#44	0.5036	0.4992	0.5032	0.4926	0.4732	0.4944	3.5
BZ#49	0.4729	0.4712	0.4651	0.4520	0.4342	0.4591	4.6
BZ#52	0.3650	0.3642	0.3603	0.3517	0.3393	0.3561	3.9
BZ#56/60	0.7285	0.7287	0.7624	0.7436	0.7195	0.7365	2.3
BZ#66/95	0.5990	0.5956	0.5798	0.5610	0.5303	0.5731	6.3
BZ#70	0.5496	0.5683	0.5920	0.5881	0.5632	0.5722	3.1
BZ#74	0.6002	0.6054	0.6116	0.6099	0.5885	0.6031	2.3
BZ#87	0.7873	0.8096	0.8122	0.8121	0.7739	0.7990	2.7
BZ#97	0.6042	0.6068	0.6038	0.5989	0.5754	0.5978	2.9
BZ#99	0.8148	0.8176	0.7315	0.7028	0.6818	0.7497	9.5
BZ#105/141	1.4575	1.4159	1.3936	1.3479	1.2330	1.3696	8.4
BZ#110	0.7065	0.7135	0.7210	0.7292	0.7029	0.7146	1.8
BZ#118	0.7973	0.8643	0.8466	0.8646	0.8308	0.8407	3.1
BZ#128	1.4216	1.4011	1.3830	1.3634	1.2713	1.3681	5.9
BZ#138/158	1.4977	1.4723	1.4416	1.4029	1.2892	1.4207	7.7
BZ#149	0.6151	0.6360	0.6258	0.6211	0.5952	0.6186	3.0
BZ#151	0.8398	0.8346	0.8324	0.8380	0.7997	0.8289	2.7
BZ#156	1.9188	1.8958	1.9137	1.9177	1.7964	1.8885	3.8
BZ#170/201	1.7502	1.7340	1.6976	1.6425	1.5180	1.6685	7.4
BZ#174	1.4032	1.3811	1.3331	1.2901	1.1947	1.3204	7.9
BZ#177	1.3895	1.3730	1.3383	1.2990	1.2073	1.3214	7.0
BZ#180	1.7694	1.7603	1.7805	1.7606	1.6517	1.7445	4.1
BZ#183	1.6187	1.5208	1.4993	1.4893	1.3832	1.5023	6.9
BZ#187	1.5658	1.4827	1.4535	1.4334	1.3304	1.4532	7.3
BZ#194	2.0200	2.0385	2.0457	2.0478	1.9312	2.0166	3.4
BZ#195	1.9823	1.9921	1.9836	1.9642	1.8518	1.9548	4.3
BZ#203	1.9193	1.9152	1.9100	1.8920	1.7710	1.8815	4.8
BZ#101	0.4770	0.4741	0.4623	0.5014	0.4727	0.4775	4.0
BZ#132	1.0785	1.0106	0.9780	0.9512	0.8800	0.9797	9.0
BZ#153	1.3769	1.1478	1.1154	1.0939	1.0170	1.1502	12.5
BZ#5	0.3527	0.3534	0.3464	0.3280	0.3134	0.3388	7.0
BZ#206	1.2266	1.2918	1.3220	1.3369	1.3172	1.2989	3.1
TCMX (SS)	0.9186	0.9437	0.9673	0.9611	0.9393	0.9460	2.2
DCBP (SS)	1.5227	1.4577	1.4101	1.3935	1.3354	1.4239	5.7

## CONGENER CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP1 ID: 0.32 (mm)

Init. Calib. Date(s): 08/12/13 08/12/13

Date Analyzed :08/12/13

Lab Standard ID: CONG#1

Time Analyzed :2012

CONGENER	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
BZ#5/8	9.54	9.44	9.64	95.7	100.0	-4.3
BZ#18	11.00	10.91	11.11	47.8	50.0	-4.4
BZ#28	13.10	13.00	13.20	47.5	50.0	-5.0
BZ#31	13.01	12.91	13.11	50.2	50.0	0.5
BZ#33	13.69	13.58	13.78	47.2	50.0	-5.5
BZ#44	15.71	15.60	15.80	47.6	50.0	-4.7
BZ#49	14.73	14.63	14.83	47.2	50.0	-5.6
BZ#52	14.63	14.53	14.73	48.0	50.0	-4.0
BZ#60	18.81	18.71	18.91	49.8	50.0	-0.4
BZ#66	18.04	17.93	18.13	46.5	50.0	-7.0
BZ#70	17.91	17.80	18.00	49.0	50.0	-2.0
BZ#74	17.45	17.34	17.54	49.0	50.0	-2.0
BZ#87	20.51	20.41	20.61	47.8	50.0	-4.4
BZ#95	17.69	17.59	17.79	45.9	50.0	-8.2
BZ#97	20.28	20.17	20.37	47.9	50.0	-4.3
BZ#99	19.28	19.18	19.38	44.8	50.0	-10.3
BZ#105	24.23	24.12	24.32	49.7	50.0	-0.5
BZ#110	21.19	21.09	21.29	47.9	50.0	-4.3
BZ#118	22.76	22.66	22.86	48.1	50.0	-3.9
BZ#128	26.87	26.76	26.96	48.4	50.0	-3.2
BZ#138	25.35	25.24	25.44	49.6	50.0	-0.8
BZ#141	24.51	24.41	24.61	48.8	50.0	-2.3
BZ#149	22.25	22.15	22.35	46.6	50.0	-6.8
BZ#151	21.48	21.37	21.57	45.7	50.0	-8.6
BZ#156	28.31	28.21	28.41	50.4	50.0	0.8
BZ#158	25.46	25.35	25.55	48.2	50.0	-3.5
BZ#170	30.63	30.52	30.72	47.7	50.0	-4.5
BZ#174	27.37	27.26	27.46	48.0	50.0	-3.9
BZ#177	27.57	27.47	27.67	47.6	50.0	-4.8
BZ#180	29.13	29.03	29.23	48.7	50.0	-2.6
BZ#183	26.29	26.19	26.39	44.1	50.0	-11.7
BZ#187	26.04	25.94	26.14	47.5	50.0	-5.0
BZ#194	34.13	34.02	34.22	48.9	50.0	-2.2
BZ#195	32.62	32.52	32.72	49.3	50.0	-1.4
BZ#201	30.90	30.79	30.99	47.8	50.0	-4.4
BZ#203	31.10	30.99	31.19	48.3	50.0	-3.4
BZ#56/101	19.07	18.97	19.17	95.9	100.0	-4.1
BZ#132/153	23.79	23.68	23.88	96.0	100.0	-4.0
BZ#206	35.70	35.59	35.79	48.7	50.0	-2.6
TCMX(SS)	8.12	8.02	8.22	40.1	40.0	0.1

AVERAGE %D = 4.0

WZ47:00122

## CONGENER CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP2 ID: 0.32 (mm)

Init. Calib. Date(s): 08/12/13 08/12/13

Date Analyzed :08/12/13

Lab Standard ID: CONG#1

Time Analyzed :2012

CONGENER	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
BZ#8	11.99	11.89	12.09	49.5	50.0	-1.0
BZ#18	13.99	13.89	14.09	48.8	50.0	-2.4
BZ#28	16.41	16.31	16.51	48.9	50.0	-2.1
BZ#31	16.34	16.24	16.44	50.9	50.0	1.8
BZ#33	17.11	17.01	17.21	50.0	50.0	-0.1
BZ#44	19.70	19.60	19.80	49.5	50.0	-1.0
BZ#49	18.50	18.40	18.60	49.1	50.0	-1.8
BZ#52	18.29	18.19	18.39	49.2	50.0	-1.6
BZ#56/60	23.36	23.26	23.46	104.8	100.0	4.8
BZ#66/95	22.13	22.03	22.23	98.2	100.0	-1.8
BZ#70	21.92	21.81	22.01	50.7	50.0	1.3
BZ#74	21.52	21.42	21.62	50.1	50.0	0.2
BZ#87	25.19	25.09	25.29	50.3	50.0	0.6
BZ#97	24.85	24.74	24.94	49.6	50.0	-0.8
BZ#99	23.59	23.49	23.69	46.2	50.0	-7.6
BZ#105/141	29.12	29.01	29.21	90.4	100.0	-9.6
BZ#110	25.85	25.74	25.94	50.3	50.0	0.5
BZ#118	27.19	27.09	27.29	50.7	50.0	1.4
BZ#128	32.12	32.02	32.22	45.7	50.0	-8.6
BZ#138/158	30.22	30.12	30.32	90.6	100.0	-9.4
BZ#149	26.98	26.88	27.08	49.8	50.0	-0.5
BZ#151	26.08	25.98	26.18	50.0	50.0	-0.0
BZ#156	33.17	33.07	33.27	46.5	50.0	-7.0
BZ#170/201	35.81	35.71	35.91	91.3	100.0	-8.7
BZ#174	32.35	32.24	32.44	45.1	50.0	-9.8
BZ#177	32.73	32.62	32.82	45.2	50.0	-9.7
BZ#180	33.84	33.74	33.94	46.2	50.0	-7.6
BZ#183	31.04	30.94	31.14	45.3	50.0	-9.3
BZ#187	30.75	30.64	30.84	45.1	50.0	-9.8
BZ#194	39.09	38.99	39.19	47.3	50.0	-5.3
BZ#195	38.07	37.96	38.16	46.7	50.0	-6.6
BZ#203	36.05	35.95	36.15	46.3	50.0	-7.3
BZ#101	23.29	23.21	23.41	43.9	50.0	-12.3
BZ#132	28.91	28.81	29.01	44.6	50.0	-10.9
BZ#153	28.25	28.15	28.35	43.7	50.0	-12.6
BZ#5	12.06	11.96	12.16	49.3	50.0	-1.5
BZ#206	40.62	40.52	40.72	53.1	50.0	6.2
TCMX (SS)	9.65	9.55	9.75	40.5	40.0	1.2
DCBP (SS)	41.57	41.47	41.67	38.8	40.0	-2.9

AVERAGE %D = 4.8

WZ47:00123

## CONGENER CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP1 ID: 0.32 (mm)

Init. Calib. Date(s): 08/12/13 08/12/13

Date Analyzed :08/13/13

Lab Standard ID: CONG#2

Time Analyzed :0700

CONGENER	RT	RT WINDOW		CALC	NOM	%D
		FROM	TO	AMOUNT	AMOUNT	
				(ng)	(ng)	
BZ#5/8	9.54	9.44	9.64	94.1	100.0	-5.9
BZ#18	11.01	10.91	11.11	46.7	50.0	-6.5
BZ#28	13.10	13.00	13.20	45.9	50.0	-8.1
BZ#31	13.01	12.91	13.11	50.6	50.0	1.3
BZ#33	13.68	13.58	13.78	46.4	50.0	-7.3
BZ#44	15.70	15.60	15.80	47.2	50.0	-5.6
BZ#49	14.73	14.63	14.83	45.9	50.0	-8.2
BZ#52	14.63	14.53	14.73	48.2	50.0	-3.5
BZ#60	18.81	18.71	18.91	49.9	50.0	-0.1
BZ#66	18.03	17.93	18.13	45.0	50.0	-9.9
BZ#70	17.90	17.80	18.00	49.6	50.0	-0.9
BZ#74	17.44	17.34	17.54	49.0	50.0	-1.9
BZ#87	20.51	20.41	20.61	47.6	50.0	-4.7
BZ#95	17.69	17.59	17.79	45.5	50.0	-9.0
BZ#97	20.27	20.17	20.37	48.2	50.0	-3.7
BZ#99	19.28	19.18	19.38	44.3	50.0	-11.4
BZ#105	24.22	24.12	24.32	50.7	50.0	1.3
BZ#110	21.19	21.09	21.29	48.5	50.0	-3.0
BZ#118	22.76	22.66	22.86	48.5	50.0	-3.0
BZ#128	26.86	26.76	26.96	50.8	50.0	1.6
BZ#138	25.34	25.24	25.44	51.8	50.0	3.6
BZ#141	24.51	24.41	24.61	48.9	50.0	-2.2
BZ#149	22.25	22.15	22.35	47.0	50.0	-6.0
BZ#151	21.47	21.37	21.57	45.8	50.0	-8.4
BZ#156	28.31	28.21	28.41	52.5	50.0	5.0
BZ#158	25.45	25.35	25.55	49.5	50.0	-1.0
BZ#170	30.62	30.52	30.72	49.9	50.0	-0.2
BZ#174	27.36	27.26	27.46	50.1	50.0	0.2
BZ#177	27.57	27.47	27.67	49.3	50.0	-1.5
BZ#180	29.13	29.03	29.23	50.7	50.0	1.4
BZ#183	26.29	26.19	26.39	46.5	50.0	-7.0
BZ#187	26.04	25.94	26.14	49.7	50.0	-0.7
BZ#194	34.12	34.02	34.22	49.9	50.0	-0.3
BZ#195	32.62	32.52	32.72	50.8	50.0	1.5
BZ#201	30.89	30.79	30.99	49.8	50.0	-0.4
BZ#203	31.09	30.99	31.19	50.1	50.0	0.2
BZ#56/101	19.07	18.97	19.17	96.0	100.0	-4.0
BZ#132/153	23.78	23.68	23.88	97.7	100.0	-2.3
BZ#206	35.69	35.59	35.79	49.2	50.0	-1.6
TCMX(SS)	8.12	8.02	8.22	39.3	40.0	-1.7

AVERAGE %D = 3.7

WZ47:00124



## CONGENER CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP2 ID: 0.32 (mm)

Init. Calib. Date(s): 08/12/13 08/12/13

Date Analyzed :08/13/13

Lab Standard ID: CONG#2

Time Analyzed :0700

CONGENER	RT	RT WINDOW		CALC	NOM	%D
		FROM	TO	AMOUNT	AMOUNT	
				(ng)	(ng)	
BZ#8	11.99	11.89	12.09	48.3	50.0	-3.3
BZ#18	13.99	13.89	14.09	47.3	50.0	-5.3
BZ#28	16.41	16.31	16.51	45.9	50.0	-8.1
BZ#31	16.34	16.24	16.44	50.5	50.0	1.0
BZ#33	17.11	17.01	17.21	47.3	50.0	-5.4
BZ#44	19.70	19.60	19.80	46.6	50.0	-6.7
BZ#49	18.50	18.40	18.60	46.3	50.0	-7.4
BZ#52	18.29	18.19	18.39	47.1	50.0	-5.8
BZ#56/60	23.36	23.26	23.46	91.4	100.0	-8.6
BZ#66/95	22.13	22.03	22.23	88.4	100.0	-11.6
BZ#70	21.91	21.81	22.01	46.6	50.0	-6.7
BZ#74	21.52	21.42	21.62	46.0	50.0	-7.9
BZ#87	25.19	25.09	25.29	44.2	50.0	-11.6
BZ#97	24.84	24.74	24.94	44.1	50.0	-11.7
BZ#99	23.59	23.49	23.69	42.4	50.0	-15.2
BZ#105/141	29.11	29.01	29.21	153.9	100.0	53.9
BZ#110	25.84	25.74	25.94	44.0	50.0	-11.9
BZ#118	27.19	27.09	27.29	43.6	50.0	-12.8
BZ#128	32.12	32.02	32.22	69.2	50.0	38.4
BZ#138/158	30.22	30.12	30.32	150.2	100.0	50.2
BZ#149	26.98	26.88	27.08	43.5	50.0	-13.0
BZ#151	26.08	25.98	26.18	43.4	50.0	-13.3
BZ#156	33.17	33.07	33.27	68.7	50.0	37.4
BZ#170/201	35.81	35.71	35.91	124.4	100.0	24.4
BZ#174	32.34	32.24	32.44	67.7	50.0	35.4
BZ#177	32.72	32.62	32.82	67.4	50.0	34.7
BZ#180	33.84	33.74	33.94	66.7	50.0	33.5
BZ#183	31.04	30.94	31.14	72.1	50.0	44.3
BZ#187	30.74	30.64	30.84	73.1	50.0	46.2
BZ#194	39.09	38.99	39.19	60.5	50.0	20.9
BZ#195	38.06	37.96	38.16	58.9	50.0	17.8
BZ#203	36.05	35.95	36.15	61.0	50.0	22.0
BZ#101	23.31	23.21	23.41	45.5	50.0	-9.0
BZ#132	28.91	28.81	29.01	75.9	50.0	51.8
BZ#153	28.25	28.15	28.35	75.2	50.0	50.4
BZ#5	12.06	11.96	12.16	47.7	50.0	-4.5
BZ#206	40.62	40.52	40.72	28.2	50.0	-43.6
TCMX (SS)	9.65	9.55	9.75	39.5	40.0	-1.4
DCBP (SS)	41.57	41.47	41.67	37.7	40.0	-5.8

AVERAGE %D = 20.3

WZ47:00125

## CONGENER INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP1

ID: 0.32(mm)

Instrument ID: ECD6

Init. Calib. Date: 08/12/13

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,  
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT
=====				=====	=====	=====	=====
ICAL MIDPT				5207677	5.734	6134467	37.415
UPPER LIMIT				10415354	5.834	12268934	37.515
LOWER LIMIT				2603838	5.634	3067234	37.315
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
=====	=====	=====	=====	=====	=====	=====	=====
01	ZZZZZ	08/12/13	1243	4639203	5.736	5299414	37.413
02		08/12/13	1333	5207677	5.734	6134467	37.415
03		08/12/13	1423	5498598	5.734	6206943	37.415
04		08/12/13	1513	5614861	5.733	6169716	37.414
05		08/12/13	1603	5530238	5.733	6118674	37.416
06		08/12/13	1652	5530216	5.734	6129874	37.418
07		08/12/13	1742	5493411	5.734	6221821	37.419
08	ZZZZZ	08/12/13	1832	6569361	5.741	7981133	37.413
09	CONG#1	08/12/13	2012	5382954	5.734	6020441	37.425
10	WZ47MBS1	08/12/13	2102	5221799	5.735	6102278	37.411
11	WZ47LCSS1	08/12/13	2151	5418026	5.734	6177137	37.407
12	ZZZZZ	08/12/13	2241	5351597	5.734	6114883	37.407
13	LA-3	08/12/13	2331	5348825	5.735	5313101	37.410
14	AREA A COMP	08/13/13	0021	5439825	5.734	5249748	37.407
15	AREA B COMP	08/13/13	0111	4671394	5.736	5514075	37.399
16	AREA B TOP	08/13/13	0201	4734538	5.735	4963356	37.424
17	AREA B TOP M	08/13/13	0251	4712988	5.735	4800687	37.429
18	AREA B TOP M	08/13/13	0340	4875806	5.736	4965547	37.431
19	CONG#2	08/13/13	0700	5227051	5.735	5824052	37.413

IS1 = 1-Bromo-2-Nitrobenzene

RT Window = RT +/- 0.1 min

IS2 = Hexabromobiphenyl

\* Indicates value outside QC Limits

## CONGENER INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: NEWFIELDS NORTHWEST

ARI Job No.: WZ47

Project: BALBOA MARINA

GC Column: CLP2

ID: 0.32(mm)

Instrument ID: ECD6

Init. Calib. Date: 08/12/13

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,  
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1	RT	IS2	RT
				AREA		AREA	
=====				=====	=====	=====	=====
				ICAL MIDPT	6.377	23414893	42.988
				UPPER LIMIT	6.477	46829786	43.088
				LOWER LIMIT	6.277	11707446	42.888
				=====	=====	=====	=====
CLIENT	LAB	DATE	TIME	IS1	RT	IS2	RT
SAMPLE NO.	SAMPLE ID	ANALYZED		AREA		AREA	
=====	=====	=====	=====	=====	=====	=====	=====
01	ZZZZZ	08/12/13	1243	32204517	6.371	21914275	42.985
02		08/12/13	1333	33561419	6.377	23414893	42.988
03	5PPB CONG	08/12/13	1423	33013318	6.377	23828361	42.988
04	10PPBCONG	08/12/13	1513	33057767	6.377	24627269	42.987
05	25PPBCONG	08/12/13	1603	33342890	6.377	25402591	42.987
06	50PPBCONG	08/12/13	1652	33899901	6.377	26756430	42.989
07	75PPBCONG	08/12/13	1742	34226677	6.378	28003484	42.989
08	100PPBCONG	08/12/13	1832	40280648	6.384	35318920	42.988
09	ZZZZZ	08/12/13	2012	33435067	6.378	27931039	42.990
10	CONG#1	08/12/13	2102	32103537	6.379	28593405	42.986
11	WZ47MBS1	08/12/13	2151	32549586	6.377	28662682	42.986
12	WZ47LCSS1	08/12/13	2241	32258855	6.378	28034348	42.985
13	ZZZZZ	08/12/13	2331	109072096*	6.351	14664555	42.987
14	LA-3	08/12/13	2331	109072096*	6.351	14664555	42.987
15	AREA A COMP	08/13/13	0021	33386381	6.378	15073606	42.987
16	AREA B COMP	08/13/13	0111	22607766	6.379	16502808	42.986
17	AREA B TOP	08/13/13	0201	25251365	6.379	13377033	42.993
18	AREA B TOP M	08/13/13	0251	24137431	6.379	14478499	42.994
19	AREA B TOP M	08/13/13	0340	25011675	6.379	17028485	42.997
19	CONG#2	08/13/13	0700	32311774	6.378	13613040	42.988

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min  
IS2 = Hexabromobiphenyl

\* Indicates value outside QC Limits

Metals Analysis  
Report and Summary QC Forms

ARI Job ID: WZ47

# Cover Page

INORGANIC ANALYSIS DATA PACKAGE



CLIENT: Newfields Northwest

PROJECT: Balboa Marina

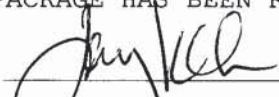
SDG: WZ47

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LA-3	WZ47A	13-15981	
LA-3D	WZ47ADUP	13-15981	
LA-3S	WZ47ASPK	13-15981	
Area A Comp	WZ47B	13-15982	
Area B Comp	WZ47C	13-15983	
Area B Top	WZ47D	13-15984	
PBS	WZ47MB1	13-15984	
LCSS	WZ47MB1SPK	13-15984	

Were ICP interelement corrections applied ?                      Yes/No    YES  
Were ICP background corrections applied ?                      Yes/No    YES  
If yes - were raw data generated before  
application of background corrections ?                      Yes/No    NO

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature:                       Name: Jay Kuhn  
Date: 8/12/13                      Title: Inorganics Director

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1


Sample ID: LA-3

SAMPLE

Lab Sample ID: WZ47A

LIMS ID: 13-15981

Matrix: Sediment

Data Release Authorized: 

Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: 07/30/13

Date Received: 07/31/13

Percent Total Solids: 43.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	08/06/13	6020A	08/07/13	7440-38-2	Arsenic	0.4	6.1	
3050B	08/06/13	6020A	08/07/13	7440-43-9	Cadmium	0.2	0.7	
3050B	08/06/13	6020A	08/07/13	7440-47-3	Chromium	1	41	
3050B	08/06/13	6020A	08/07/13	7440-50-8	Copper	1	27	
3050B	08/06/13	6020A	08/07/13	7439-92-1	Lead	0.2	14.3	
CLP	08/06/13	7471A	08/09/13	7439-97-6	Mercury	0.05	0.09	
3050B	08/06/13	6020A	08/07/13	7440-02-0	Nickel	1	25	
3050B	08/06/13	6020A	08/07/13	7782-49-2	Selenium	1	1	
3050B	08/06/13	6020A	08/07/13	7440-22-4	Silver	0.4	0.4	U
3050B	08/06/13	6020A	08/07/13	7440-66-6	Zinc	9	90	

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: Area A Comp  
SAMPLE

Lab Sample ID: WZ47B

LIMS ID: 13-15982

Matrix: Sediment

Data Release Authorized: 

Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: 07/30/13

Date Received: 07/31/13

Percent Total Solids: 75.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	08/06/13	6020A	08/07/13	7440-38-2	Arsenic	0.3	3.3	
3050B	08/06/13	6020A	08/07/13	7440-43-9	Cadmium	0.1	0.4	
3050B	08/06/13	6020A	08/07/13	7440-47-3	Chromium	0.6	12.2	
3050B	08/06/13	6020A	08/07/13	7440-50-8	Copper	0.6	17.4	
3050B	08/06/13	6020A	08/07/13	7439-92-1	Lead	0.1	10.2	
CLP	08/06/13	7471A	08/09/13	7439-97-6	Mercury	0.03	0.17	
3050B	08/06/13	6020A	08/07/13	7440-02-0	Nickel	0.6	7.9	
3050B	08/06/13	6020A	08/07/13	7782-49-2	Selenium	0.6	0.6	U
3050B	08/06/13	6020A	08/07/13	7440-22-4	Silver	0.3	0.3	U
3050B	08/06/13	6020A	08/07/13	7440-66-6	Zinc	5	54	

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: Area B Comp  
SAMPLE

Lab Sample ID: WZ47C

LIMS ID: 13-15983

Matrix: Sediment

Data Release Authorized: 

Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: 07/30/13

Date Received: 07/31/13

Percent Total Solids: 82.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	08/06/13	6020A	08/07/13	7440-38-2	Arsenic	0.2	1.9	
3050B	08/06/13	6020A	08/07/13	7440-43-9	Cadmium	0.1	0.2	
3050B	08/06/13	6020A	08/07/13	7440-47-3	Chromium	0.6	5.8	
3050B	08/06/13	6020A	08/07/13	7440-50-8	Copper	0.6	6.4	
3050B	08/06/13	6020A	08/07/13	7439-92-1	Lead	0.1	4.1	
CLP	08/06/13	7471A	08/09/13	7439-97-6	Mercury	0.02	0.03	
3050B	08/06/13	6020A	08/07/13	7440-02-0	Nickel	0.6	4.7	
3050B	08/06/13	6020A	08/07/13	7782-49-2	Selenium	0.6	0.6	U
3050B	08/06/13	6020A	08/07/13	7440-22-4	Silver	0.2	0.2	U
3050B	08/06/13	6020A	08/07/13	7440-66-6	Zinc	5	27	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation



**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1


Sample ID: LA-3

**MATRIX SPIKE**

Lab Sample ID: WZ47A

LIMS ID: 13-15981

Matrix: Sediment

Data Release Authorized: 

Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: 07/30/13

Date Received: 07/31/13

**MATRIX SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6020A	6.1	60.1	54.6	98.9%	
Cadmium	6020A	0.7	55.5	54.6	100%	
Chromium	6020A	41	92	54.6	93.4%	
Copper	6020A	27	84	54.6	104%	
Lead	6020A	14.3	69.7	54.6	101%	
Mercury	7471A	0.09	0.59	0.443	113%	
Nickel	6020A	25	82	54.6	104%	
Selenium	6020A	1	173	175	98.3%	
Silver	6020A	0.4 U	52.5	54.6	96.2%	
Zinc	6020A	90	259	175	96.6%	

Reported in mg/kg-dry

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: LA-3  
DUPLICATE

Lab Sample ID: WZ47A

LIMS ID: 13-15981

Matrix: Sediment

Data Release Authorized: 

Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: 07/30/13

Date Received: 07/31/13

**MATRIX DUPLICATE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6020A	6.1	6.0	1.7%	+/- 20%	
Cadmium	6020A	0.7	0.7	0.0%	+/- 0.2	L
Chromium	6020A	41	43	4.8%	+/- 20%	
Copper	6020A	27	28	3.6%	+/- 20%	
Lead	6020A	14.3	14.6	2.1%	+/- 20%	
Mercury	7471A	0.09	0.09	0.0%	+/- 0.05	L
Nickel	6020A	25	25	0.0%	+/- 20%	
Selenium	6020A	1	1	0.0%	+/- 1	L
Silver	6020A	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	6020A	90	91	1.1%	+/- 20%	

Reported in mg/kg-dry

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: LAB CONTROL**

Lab Sample ID: WZ47LCS

LIMS ID: 13-15984

Matrix: Sediment

Data Release Authorized: 

Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

<b>Analyte</b>	<b>Analysis Method</b>	<b>Spike Found</b>	<b>Spike Added</b>	<b>% Recovery</b>	<b>Q</b>
Arsenic	6020A	27.1	25.0	108%	
Cadmium	6020A	26.1	25.0	104%	
Chromium	6020A	26.4	25.0	106%	
Copper	6020A	27.6	25.0	110%	
Lead	6020A	26.8	25.0	107%	
Mercury	7471A	0.52	0.50	104%	
Nickel	6020A	27.3	25.0	109%	
Selenium	6020A	83.3	80.0	104%	
Silver	6020A	26.1	25.0	104%	
Zinc	6020A	89	80	111%	

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: METHOD BLANK**

Lab Sample ID: WZ47MB

LIMS ID: 13-15984

Matrix: Sediment

Data Release Authorized: 

Reported: 08/09/13

QC Report No: WZ47-Newfields Northwest

Project: Balboa Marina

860.0100.000

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	08/06/13	6020A	08/07/13	7440-38-2	Arsenic	0.2	0.2	U
3050B	08/06/13	6020A	08/07/13	7440-43-9	Cadmium	0.1	0.1	U
3050B	08/06/13	6020A	08/07/13	7440-47-3	Chromium	0.5	0.5	U
3050B	08/06/13	6020A	08/07/13	7440-50-8	Copper	0.5	0.5	U
3050B	08/06/13	6020A	08/07/13	7439-92-1	Lead	0.1	0.1	U
CLP	08/06/13	7471A	08/09/13	7439-97-6	Mercury	0.02	0.02	U
3050B	08/06/13	6020A	08/07/13	7440-02-0	Nickel	0.5	0.5	U
3050B	08/06/13	6020A	08/07/13	7782-49-2	Selenium	0.5	0.5	U
3050B	08/06/13	6020A	08/07/13	7440-22-4	Silver	0.2	0.2	U
3050B	08/06/13	6020A	08/07/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

# Calibration Verification

CLIENT: Newfields Northwest

PROJECT: Balboa Marina

SDG: WZ47



UNITS:ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	PMS	MS080781	50.0	52.58	105.2	50.0	49.97	99.9	49.55	99.1	50.11	100.2	50.74	101.5	50.20	100.4
Cadmium	CD	PMS	MS080781	50.0	50.61	101.2	50.0	49.94	99.9	50.33	100.7	50.44	100.9	50.13	100.3	50.43	100.9
Chromium	CR	PMS	MS080781	50.0	51.27	102.5	50.0	50.59	101.2	49.53	99.1	52.18	104.4	53.07	106.1	52.11	104.2
Copper	CU	PMS	MS080781	50.0	52.31	104.6	50.0	49.81	99.6	49.37	98.7	52.31	104.6	52.90	105.8	52.62	105.2
Lead	PB	PMS	MS080781	50.0	52.38	104.8	50.0	49.94	99.9	50.27	100.5	52.07	104.1	51.50	103.0	51.59	103.2
Mercury	HG	CVA	HG080902	8.0	8.26	103.3	4.0	3.94	98.5	4.00	100.0						
Nickel	NI	PMS	MS080781	50.0	52.55	105.1	50.0	50.20	100.4	49.08	98.2	52.27	104.5	52.52	105.0	52.39	104.8
Selenium	SE	PMS	MS080781	80.0	81.02	101.3	50.0	49.75	99.5	48.62	97.2	49.02	98.0	49.14	98.3	50.03	100.1
Silver	AG	PMS	MS080781	50.0	51.34	102.7	50.0	50.21	100.4	50.15	100.3	49.99	100.0	50.39	100.8	50.52	101.0
Zinc	ZN	PMS	MS080781	50.0	51.85	103.7	50.0	51.91	103.8	51.45	102.9	52.94	105.9	53.69	107.4	52.96	105.9

Control Limits: Mercury 80-120; Other Metals 90-110



# Calibration Verification

CLIENT: Newfields Northwest

PROJECT: Balboa Marina

SDG: WZ47

UNITS: ug/L

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Arsenic	AS	PMS	MS080781	50.0	50.09	100.2	50.19	100.4								
Cadmium	CD	PMS	MS080781	50.0	50.29	100.6	50.80	101.6								
Chromium	CR	PMS	MS080781	50.0	51.10	102.2	51.26	102.5								
Copper	CU	PMS	MS080781	50.0	51.63	103.3	50.75	101.5								
Lead	PB	PMS	MS080781	50.0	51.06	102.1	50.85	101.7								
Mercury	HG	CVA	HG080902	4.0												
Nickel	NI	PMS	MS080781	50.0	52.00	104.0	50.58	101.2								
Selenium	SE	PMS	MS080781	50.0	51.14	102.3	50.55	101.1								
Silver	AG	PMS	MS080781	50.0	49.32	98.6	50.30	100.6								
Zinc	ZN	PMS	MS080781	50.0	52.94	105.9	52.21	104.4								

Control Limits: Mercury 80-120; Other Metals 90-110

**CRDI Standard**

CLIENT: Newfields Northwest

PROJECT: Balboa Marina

SDG: WZ47



UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	PMS	MS080781		0.2	0.21	105.0										
Cadmium	CD	PMS	MS080781		0.1	0.11	110.0										
Chromium	CR	PMS	MS080781		0.5	0.52	104.0										
Copper	CU	PMS	MS080781		0.5	0.52	104.0										
Lead	PB	PMS	MS080781		0.1	0.11	110.0										
Mercury	HG	CVA	HG080902		0.1	0.10	100.0										
Nickel	NI	PMS	MS080781		0.5	0.54	108.0										
Selenium	SE	PMS	MS080781		0.5	0.46	92.0										
Silver	AG	PMS	MS080781		0.2	0.25	125.0										
Zinc	ZN	PMS	MS080781		4.0	4.46	111.5										

Control Limits: no control limits have been established by the EPA at this time.

# Calibration Blanks

CLIENT: Newfields Northwest

PROJECT: Balboa Marina

SDG: WZ47



UNITS: ug/L

ANALYTE	EL METH	RUN	CRDL	IDL	ICB	CCB1	CCB2	CCB3	CCB4	CCB5
Arsenic	PMS	MS080781	10.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cadmium	PMS	MS080781	5.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Chromium	PMS	MS080781	10.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Copper	PMS	MS080781	25.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead	PMS	MS080781	3.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mercury	CVA	HG080902	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nickel	PMS	MS080781	40.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Selenium	PMS	MS080781	5.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Silver	PMS	MS080781	10.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Zinc	PMS	MS080781	20.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0

WZ47:00141



# Calibration Blanks

CLIENT: Newfields Northwest

PROJECT: Balboa Marina

SDG: WZ47



UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	CCB7	CCB8	CCB9	CCB10	CCB11	C
Arsenic	AS	PMS	MS080781	10.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	U
Cadmium	CD	PMS	MS080781	5.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	U
Chromium	CR	PMS	MS080781	10.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	U
Copper	CU	PMS	MS080781	25.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	U
Lead	PB	PMS	MS080781	3.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	U
Mercury	HG	CVA	HG080902	0.2	0.1							U
Nickel	NI	PMS	MS080781	40.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	U
Selenium	SE	PMS	MS080781	5.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	U
Silver	AG	PMS	MS080781	10.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	U
Zinc	ZN	PMS	MS080781	20.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	U

WZ47:00142

# ICP Interference Check Sample



CLIENT: Newfields Northwest  
 PROJECT: Balboa Marina  
 SDG: WZ47

ICS SOURCE: I.V.  
 RUNID: MS080781  
 INSTRUMENT ID: PE ELAN 6000

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Antimony			0.1	0.1							
Arsenic	20		0.1	19.6	98.0						
Cadmium	20		0.1	19.8	99.0						
Chromium	20		0.5	20.3	101.5						
Cobalt	20		0.0	19.8	99.0						
Copper	20		0.6	19.7	98.5						
Manganese	20		0.1	19.8	99.0						
Molybdenum	400	400	380.8	383.0	95.8						
Nickel	20		0.5	19.5	97.5						
Silver	20		0.0	19.2	96.0						
Vanadium			0.1	-0.2							
Zinc	20		2.2	20.5	102.5						

WZ47: 00143

# IDLs and ICP Linear Ranges



CLIENT: Newfields Northwest

PROJECT: Balboa Marina

SDG: WZ47

UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENGTH (nm)	GFA BACK- GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Arsenic	AS	PMS	PE ELAN 6000 MS	0.00		10	0.2	4/1/2012		
Cadmium	CD	PMS	PE ELAN 6000 MS	0.00		5	0.1	4/1/2012		
Chromium	CR	PMS	PE ELAN 6000 MS	0.00		10	0.5	4/1/2012		
Copper	CU	PMS	PE ELAN 6000 MS	0.00		25	0.5	4/1/2012		
Lead	PB	PMS	PE ELAN 6000 MS	0.00		3	0.1	4/1/2012		
Mercury	HG	CVA	CETAC MERCURY	253.70		0.2	0.1	4/1/2012		
Nickel	NI	PMS	PE ELAN 6000 MS	0.00		40	0.5	4/1/2012		
Selenium	SE	PMS	PE ELAN 6000 MS	0.00		5	0.5	4/1/2012		
Silver	AG	PMS	PE ELAN 6000 MS	0.00		10	0.2	4/1/2012		
Zinc	ZN	PMS	PE ELAN 6000 MS	0.00		20	4.0	4/1/2012		

# Preparation Log



CLIENT: Newfields Northwest

ANALYSIS METHOD: PMS

PROJECT: Balboa Marina

ARI PREP CODE: SWN

SDG: WZ47

PREPDATE: 8/6/2013

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LA-3	WZ47A	1.047	0.0	50.0
LA-3D	WZ47ADUP	1.049	0.0	50.0
LA-3S	WZ47ASPK	1.044	0.0	50.0
Area A Comp	WZ47B	1.043	0.0	50.0
Area B Comp	WZ47C	1.032	0.0	50.0
Area B Top	WZ47D	1.014	0.0	50.0
PBS	WZ47MB1	1.000	0.0	50.0
LCSS	WZ47MB1SPK	1.000	0.0	50.0

# Preparation Log



CLIENT: Newfields Northwest

ANALYSIS METHOD: CVA

PROJECT: Balboa Marina

ARI PREP CODE: SMM

SDG: WZ47

PREPDATE: 8/6/2013

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LA-3	WZ47A	0.253	0.0	50.0
LA-3D	WZ47ADUP	0.254	0.0	50.0
LA-3S	WZ47ASPK	0.257	0.0	50.0
Area A Comp	WZ47B	0.213	0.0	50.0
Area B Comp	WZ47C	0.270	0.0	50.0
Area B Top	WZ47D	0.227	0.0	50.0
PBS	WZ47MB1	0.200	0.0	50.0
LCSW	WZ47MB1SPK	0.200	0.0	50.0



# Analysis Run Log

CLIENT: Newfields Northwest  
 PROJECT: Balboa Marina  
 SDG: WZ47  
 INSTRUMENT ID: PE ELAN 6000 MS  
 RUNID: MS080781  
 METHOD: PMS  
 START DATE: 8/7/2013  
 END DATE: 8/7/2013

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09080		X																												X
S1	S1	1.00	09140		X																												X
S2	S2	1.00	09200		X																												X
S3	S3	1.00	09250		X																												X
S4	S4	1.00	09310		X																												X
ZZZZZZ	Rinse Sampl	1.00	09370																														
ZZZZZZ	ZZZZZZ	1.00	09440																														
ZZZZZZ	ZZZZZZ	1.00	09510																														
S0	S0	1.00	09580		X																												X
ICV	MICV	1.00	10030		X																												X
ICB	ICB	1.00	10100		X																												X
CCV	MCCV1	1.00	10150		X																												X
CCB	CCB1	1.00	10220		X																												X
CRI	MCRI	1.00	10270		X																												X
ICSA	ICSAI	1.00	10320		X																												X
ICSAB	ICSABI	1.00	10380		X																												X
ZZZZZZ	LR200	1.00	10440																														
ZZZZZZ	LR300	1.00	10510																														
CCV	MCCV2	1.00	10570		X																												X
CCB	CCB2	1.00	11030		X																												X
ZZZZZZ	WY42B	50.00	11140																														
ZZZZZZ	WY42C	50.00	11200																														
ZZZZZZ	WY42D	50.00	11260																														
ZZZZZZ	WY42ADUP	50.00	11320																														
ZZZZZZ	WY42A	50.00	11380																														
ZZZZZZ	WY42ASPK	50.00	11440																														
ZZZZZZ	ZZZZZZ	50.00	11500																														
CCV	MCCV3	1.00	11560		X																												X
CCB	CCB3	1.00	12020		X																												X
S0	S0	1.00	12080		X																												X
CCV	MCCV4	1.00	12140		X																												X
CCB	CCB4	1.00	12210		X																												X
ZZZZZZ	WZ35MB	2.00	12270																														
ZZZZZZ	WZ35B	2.00	12330																														
ZZZZZZ	WZ35C	2.00	12390																														



**Analysis Run Log**

CLIENT: Newfields Northwest

PROJECT: Balboa Marina

SDG: WZ47

INSTRUMENT ID: CETAC MERCURY

RUNID: HG080902 METHOD: CVA

START DATE: 8/9/2013

END DATE: 8/9/2013

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN				
S0	S0	1.00	11235														X																				
S0.1	S0.1	1.00	11253														X																				
S0.5	S0.5	1.00	11270														X																				
S1	S1	1.00	11284														X																				
S2	S2	1.00	11302														X																				
S5	S5	1.00	11320														X																				
S10	S10	1.00	11333														X																				
ICV	AICV	1.00	11365														X																				
ICB	ICB	1.00	11382														X																				
CCV	ACCV1	1.00	11400														X																				
CCB	CCB1	1.00	11414														X																				
CRA	CRA	1.00	11432														X																				
PBW	WZ47MB1	1.00	11445														X																				
LCSW	WZ47MB1SPK	1.00	11463														X																				
LA-3	WZ47A	1.00	11480														X																				
LA-3D	WZ47ADUP	1.00	11494														X																				
LA-3S	WZ47ASEPK	1.00	11512														X																				
Area A Comp	WZ47B	1.00	11525														X																				
Area B Comp	WZ47C	1.00	11543														X																				
Area B Top	WZ47D	1.00	11561														X																				
CCV	ACCV2	1.00	11575														X																				
CCB	CCB2	1.00	11593														X																				

WZ47 : 00149



General Chemistry Analysis  
Report and Summary QC Forms

ARI Job ID: WZ47

SAMPLE RESULTS-CONVENTIONALS  
WZ47-Newfields Northwest



Matrix: Sediment  
Data Release Authorized:  
Reported: 08/16/13

A handwritten signature in black ink, appearing to be 'J. [unclear]', written over the 'Data Release Authorized' text.

Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13


Client ID: LA-3  
ARI ID: 13-15981 WZ47A

Analyte	Date	Method	Units	RL	Sample
Total Solids	08/05/13 080513#1	SM2540B	Percent	0.01	44.48
Total Volatile Solids	08/05/13 080513#1	SM2540E	Percent	0.01	7.23
Total Organic Carbon	08/15/13	Plumb,1981	Percent	0.020	2.07

RL Analytical reporting limit  
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS  
WZ47-Newfields Northwest



Matrix: Sediment  
Data Release Authorized:   
Reported: 08/16/13

Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

Client ID: Area A Comp  
ARI ID: 13-15982 WZ47B

Analyte	Date	Method	Units	RL	Sample
Total Solids	08/05/13 080513#1	SM2540B	Percent	0.01	75.09
Total Volatile Solids	08/05/13 080513#1	SM2540E	Percent	0.01	1.67
Total Organic Carbon	08/15/13	Plumb,1981	Percent	0.020	0.511

RL Analytical reporting limit  
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS  
WZ47-Newfields Northwest



Matrix: Sediment  
Data Release Authorized:  
Reported: 08/16/13

A handwritten signature in black ink, appearing to be 'J. [unclear]', written over the 'Data Release Authorized' text.

Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13


Client ID: Area B Comp  
ARI ID: 13-15983 WZ47C

Analyte	Date	Method	Units	RL	Sample
Total Solids	08/05/13 080513#1	SM2540B	Percent	0.01	84.24
Total Volatile Solids	08/05/13 080513#1	SM2540E	Percent	0.01	0.62
Total Organic Carbon	08/15/13	Plumb,1981	Percent	0.020	0.228

RL Analytical reporting limit  
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS  
WZ47-Newfields Northwest



Matrix: Sediment  
Data Release Authorized:   
Reported: 08/16/13

Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: 07/30/13  
Date Received: 07/31/13

Analyte	Date	Units	Sample	Replicate (s)	RPD/RSD
<b>ARI ID: WZ47A Client ID: LA-3</b>					
Total Solids	08/05/13	Percent	44.48	44.50 44.77	0.4%
Total Volatile Solids	08/05/13	Percent	7.23	7.23 7.23	0.0%

LAB CONTROL RESULTS-CONVENTIONALS  
WZ47-Newfields Northwest



Matrix: Sediment  
Data Release Authorized  
Reported: 08/16/13


A handwritten signature in black ink, appearing to be 'M. J.', with a checkmark above it.

Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: NA  
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon Plumb, 1981	ICVL	08/14/13	Percent	0.100	0.100	100.0%

METHOD BLANK RESULTS-CONVENTIONALS  
WZ47-Newfields Northwest




Matrix: Sediment  
Data Release Authorized:   
Reported: 08/16/13

Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: NA  
Date Received: NA

Analyte	Date	Units	Blank	QC ID
Total Solids	08/05/13	Percent	< 0.01 U	ICB
Total Volatile Solids	08/05/13	Percent	< 0.01 U	ICB
Total Organic Carbon	08/14/13	Percent	< 0.020 U	ICB

STANDARD REFERENCE RESULTS-CONVENTIONALS  
WZ47-Newfields Northwest



Matrix: Sediment  
Data Release Authorized:   
Reported: 08/16/13

Project: Balboa Marina  
Event: 860.0100.000  
Date Sampled: NA  
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
Total Organic Carbon NIST 1941B	08/14/13	Percent	3.28	2.99	109.7%



Total Solids

ARI Job ID: WZ47

Solids Data Entry Report  
Date: 08/07/13

Checked by: DM Date: 8/7/13  
Data Analyst: CB

Solids Determination performed on 08/06/13 by CB

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
WZ47	A	LA-3	0.981	10.738	5.263	43.89
WZ47	B	Area A Comp	0.988	10.794	8.400	75.59
WZ47	C	Area B Comp	0.949	10.933	9.204	82.68
WZ47	D	Area B Top	1.002	10.248	9.438	91.24



Extractions Total Solids-exttts  
Data By: Alex Choeng  
Created: 8/ 1/13

Worklist: 5372  
Analyst: RVR  
Comments:

Oven ID: \_\_\_\_\_

Balance ID: \_\_\_\_\_

Samples In:            Date: \_\_\_\_\_ Time: \_\_\_\_\_ Temp: \_\_\_\_\_ Analyst: \_\_\_\_\_

Samples Out:           Date: \_\_\_\_\_ Time: \_\_\_\_\_ Temp: \_\_\_\_\_ Analyst: \_\_\_\_\_

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	WZ47A 13-15981 LA-3	1.16	13.94	7.13	46.7	NR
2.	WZ47B 13-15982 Area A Comp	1.17	15.31	12.00	76.6	NR
3.	WZ47C 13-15983 Area B Comp	1.17	13.95	11.80	83.2	NR
4.	WZ47D 13-15984 Area B Top	1.17	11.69	10.72	90.8	NR

Extractions Total Solids-extts  
Data By: Alex Choeng  
Created: 8/ 1/13

Worklist: 5372  
Analyst: AC  
Comments:

Oven ID: ϕ15

Balance ID: B139298ϕϕ2

Samples In: Date: 8-1-13 Time: 19:4ϕ Temp: 1ϕ5°C Analyst: AC

Samples Out: Date: 8/24/13 Time: ϕ8:ϕϕ Temp: 1ϕ4°C Analyst: SR

ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1. WZ47A 13-15981 LA-3	<u>1.16</u>	<u>13.94</u>	<u>7.13</u>		NR
2. WZ47B 13-15982 Area A Comp	<u>1.17</u>	<u>15.31</u>	<u>12.ϕϕ</u>		NR
3. WZ47C 13-15983 Area B Comp	<u>1.17</u>	<u>13.95</u>	<u>11.8ϕ</u>		NR
4. WZ47D 13-15984 Area B Top	<u>1.17</u>	<u>11.69</u>	<u>1ϕ.72</u>		NR

Geotechnical Analysis.  
Report and Summary QC Forms

ARI Job ID: WZ47

GEOTECHNICAL ANALYSIS DATA SHEET  
Specific Gravity by Method ASTM D854



Data Release Authorized: *al*  
Reported: 08/14/13  
Date Received: 07/31/13  
Page 1 of 1

QC Report No: WZ47-Newfields Northwest  
Project: Balboa Marina  
860.0100.000

Client/ ARI ID	Date Sampled	Matrix	Analysis Date	Result
LA-3 WZ47A 13-15981	07/30/13	Sediment	08/12/13 10:01	2.722
Area A Comp WZ47B 13-15982	07/30/13	Sediment	08/12/13 10:01	2.662
Area B Comp WZ47C 13-15983	07/30/13	Sediment	08/12/13 10:01	2.693
Area B Top WZ47D 13-15984	07/31/13	Sediment	08/12/13 10:01	2.682

Reported in Std Units

Newfields Northwest  
 Balboa Marina  
 860.0100.000

Apparent Grain Size Distribution Summary  
 Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay		
	-3	-2	-1						5	6	7	8	9	10	
Phi Size				0	1	2	3	4							
Sieve Size (microns)	3/8"	#4 (4750)	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (63)							
LA-3	100.0	100.0	100.0	99.5	98.0	95.6	93.2	87.3	59.7	42.4	29.6	22.4	17.6	11.8	
	100.0	100.0	100.0	99.6	98.6	97.3	95.4	89.4	63.9	42.5	30.4	23.2	18.1	12.1	
	100.0	100.0	100.0	99.5	98.2	96.6	94.7	88.8	63.5	43.0	30.9	23.4	18.2	12.1	
Area A Comp	100.0	94.9	92.8	91.2	85.9	62.4	33.2	20.9	17.5	15.6	14.1	12.3	10.4	8.4	
Area B Comp	100.0	98.5	96.4	94.2	87.8	62.4	21.7	5.7	3.5	2.8	2.3	2.0	1.6	1.3	
Area B Top	100.0	89.3	83.1	76.4	64.5	40.9	19.3	10.1	6.7	5.0	3.9	2.9	2.2	1.5	

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

WZ47



Newfields Northwest  
 Balboa Marina  
 860.0100.000

Apparent Grain Size Distribution Summary  
 Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay			Total Fines
											8 to 9	9 to 10	> 10	
Phi Size	< -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	> 10	> 4
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	< 1.0	<230 (<62)
LA-3	0.0	0.5	1.5	2.4	2.4	5.9	27.6	17.3	12.8	7.2	4.8	5.8	11.8	87.3
	0.0	0.4	1.0	1.3	1.9	5.9	25.5	21.4	12.1	7.1	5.2	5.9	12.1	89.4
	0.0	0.5	1.3	1.6	1.9	5.9	25.2	20.6	12.1	7.5	5.2	6.0	12.1	88.8
Area A Comp	7.2	1.5	5.3	23.5	29.2	12.3	3.4	1.9	1.5	1.9	1.8	2.0	8.4	20.9
Area B Comp	3.6	2.2	6.4	25.4	40.7	15.9	2.2	0.7	0.5	0.4	0.3	0.3	1.3	5.7
Area B Top	16.9	6.6	12.0	23.6	21.6	9.2	3.4	1.7	1.1	0.9	0.7	0.7	1.5	10.1

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

WZ47

QA SUMMARY

Client	Newfields Northwest	Client Project:	Balboa Manna
ARI Trip Sample ID:	WZ47A	Client Project No.	860.0100 000
Client Trip Sample ID:	LA-3	Batch No	WZ47-1

Sample ID	Relative Standard Deviation, By Phi Size													
	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
LA-3	100.0	100.0	100.0	99.5	98.0	95.6	93.2	87.3	59.7	42.4	29.6	22.4	17.6	11.8
	100.0	100.0	100.0	99.6	98.6	97.3	95.4	89.4	63.9	42.5	30.4	23.2	18.1	12.1
	100.0	100.0	100.0	99.5	98.2	96.6	94.7	88.8	63.5	43.0	30.9	23.4	18.2	12.1
AVE	100.0	100.0	100.0	99.5	98.3	96.5	94.4	88.5	62.4	42.6	30.3	23.0	18.0	12.0
STDEV	0.0	0.0	0.0	0.1	0.3	0.8	1.1	1.1	2.3	0.3	0.7	0.5	0.3	0.2
%RSD	0.0	0.0	0.0	0.1	0.3	0.9	1.2	1.2	3.7	0.7	2.2	2.3	1.6	1.7

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5 0-25.0g)
LA-3	7/30/2013	8/6/2013	8/13/2013	100.6		22.2
	7/30/2013	8/6/2013	8/13/2013	101.2		22.9
	7/30/2013	8/6/2013	8/13/2013	99.8		21.6
Area A Comp	7/30/2013	8/6/2013	8/13/2013	101.9		12.3
Area B Comp	7/30/2013	8/6/2013	8/13/2013	100.8		7.2
Area B Top	7/31/2013	8/6/2013	8/13/2013	100.4		14.1

\* ARI Internal QA limits = 95-105%

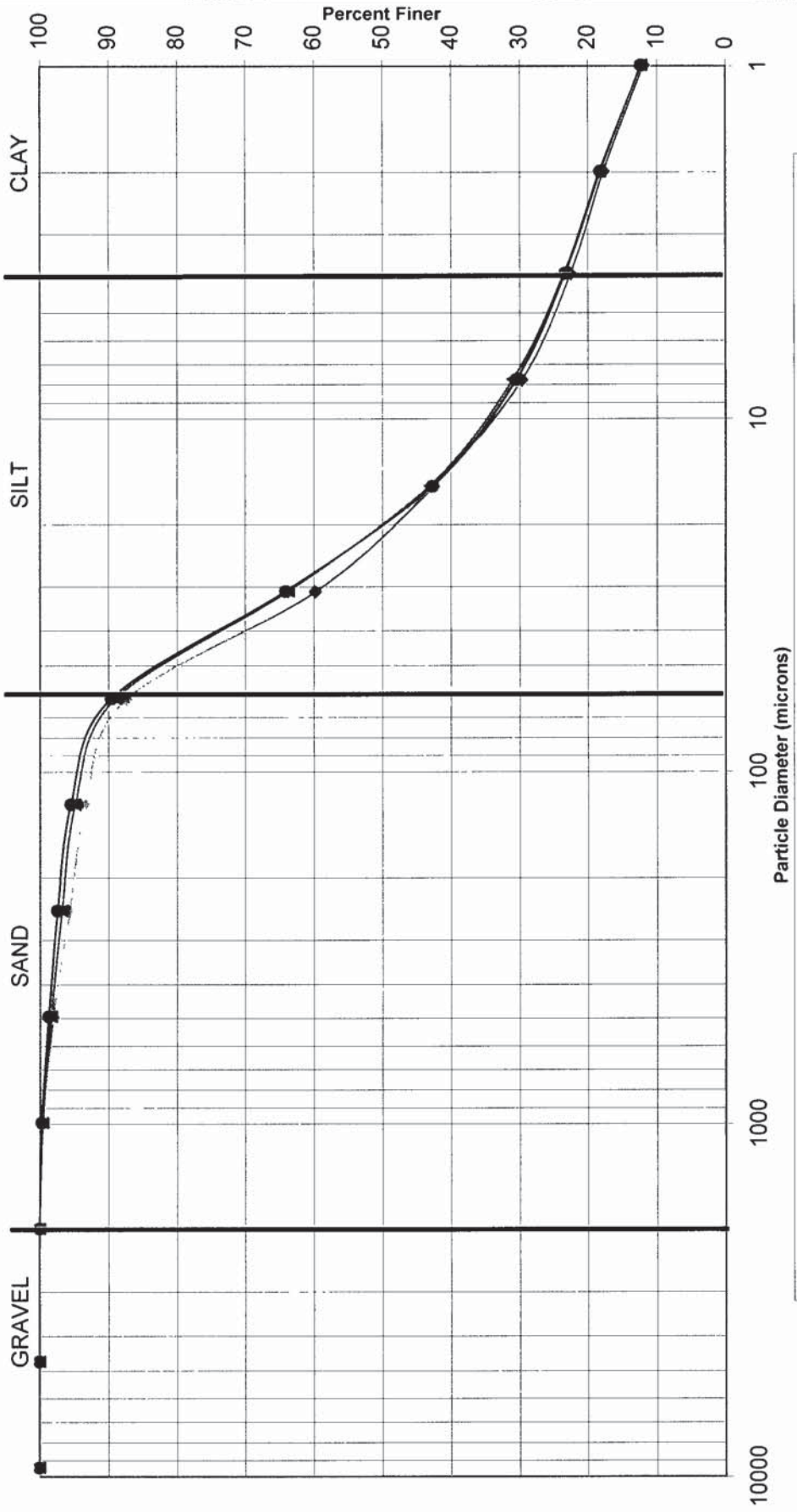
Notes to the Testing:

- Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing

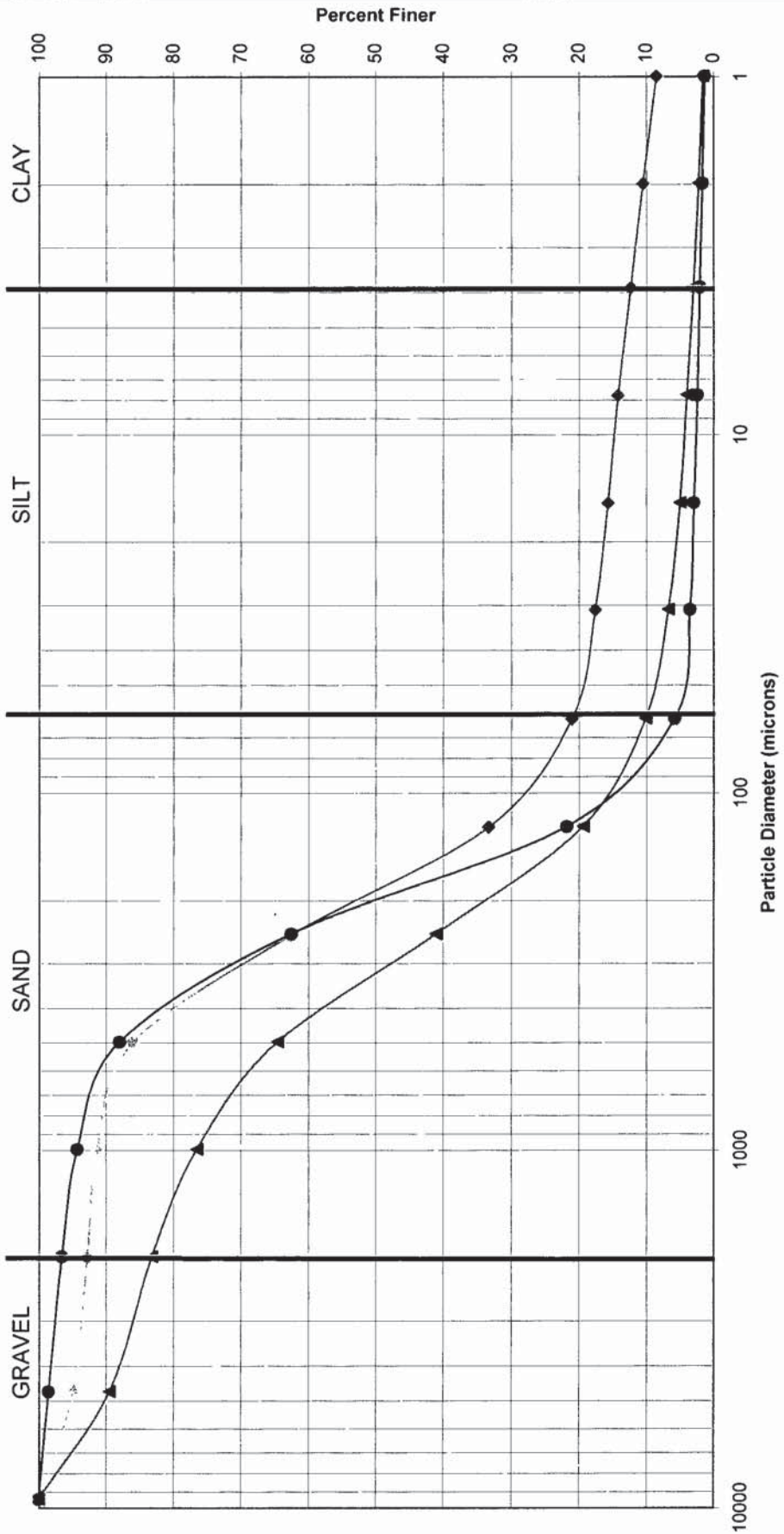
WZ47

# PSEP Grain Size Distribution

Triplicate Sample Plot



# PSEP Grain Size Distribution



Area A Comp     
  Area B Comp     
  Area B Top



September 06, 2013

Bill Gardiner  
NewFields  
1349 W. Peachtree St  
Suite 2000  
Atlanta, GA 30309-2926

Project Name: Balboa Marina  
Physis Project ID: 1308001-001

Dear Bill,


Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 8/2/2013. A total of 4 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Percent Solids by SM 2540B
Organics
Synthetic Pyrethroid Pesticides + 2 by EPA 8270C-NCI

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

  
on behalf of  
Misty Mercier  
Extension 202  
714-335-5918 cell  
mistymercier@physislabs.com

## ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

## QUALITY ASSURANCE SUMMARY

**LABORATORY BATCH:** Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

**PROCEDURAL BLANK:** Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

**ACCURACY:** Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

**PRECISION:** Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS<sub>1</sub>/MS<sub>2</sub>, BS<sub>1</sub>/BS<sub>2</sub>, LCS<sub>1</sub>/LCS<sub>2</sub>, LCM<sub>1</sub>/LCM<sub>2</sub>, CRM<sub>1</sub>/CRM<sub>2</sub>, surrogate spikes and/or replicate project sample analysis (R<sub>1</sub>/R<sub>2</sub>) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

**MATRIX SPIKES:** MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

**BLANK SPIKES:** BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

**CERTIFIED REFERENCE MATERIALS:** CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

**SURROGATES:** Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

**HOLDING TIME:** Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's

concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

**TOTAL/DISSOLVED FRACTION:** In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

**PHYSIS QUALIFIER CODES**

<b>CODE</b>	<b>DEFINITION</b>
<b>*</b>	see Case Narrative
<b>ND</b>	analyte not detected at or above the MDL
<b>B</b>	analyte was detected in the procedural blank greater than 10 times the MDL
<b>E</b>	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
<b>H</b>	sample received and/or analyzed past the recommended holding time
<b>J</b>	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
<b>N</b>	insufficient sample, analysis could not be performed
<b>M</b>	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
<b>SH</b>	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
<b>SL</b>	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
<b>NH</b>	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
<b>R</b>	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples



# ENVIRONMENTAL ANALYTICAL LABORATORIES, INC.

# REPORT

*Innovative Solutions for Nature*



1904 E. Wright Circle, Anaheim CA 92806    main: (714) 602-5320    fax: (714) 602-5321    www.physislabs.com    info@physislabs.com    CA ELAP #2769

## Conventionals

## ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
<b>Sample ID: 21940-R1</b>	<b>LA - 3 Ref 7/30/13 @ 12:12</b>	<b>Matrix: Sediment</b>				<b>Received: 02-Aug-13</b>
Percent Solids	Method: SM 2540B NA	Batch ID: C-13093 46.5	0.1	0.1	12:12 % Dry Weight	Analyzed: 13-Aug-13
<b>Sample ID: 21941-R1</b>	<b>Area A Comp 7/30/13 @ 10:50</b>	<b>Matrix: Sediment</b>				<b>Received: 02-Aug-13</b>
Percent Solids	Method: SM 2540B NA	Batch ID: C-13093 75.9	0.1	0.1	10:50 % Dry Weight	Analyzed: 13-Aug-13
<b>Sample ID: 21942-R1</b>	<b>Area B Comp 7/30/13 @ 14:43</b>	<b>Matrix: Sediment</b>				<b>Received: 02-Aug-13</b>
Percent Solids	Method: SM 2540B NA	Batch ID: C-13093 83.1	0.1	0.1	14:43 % Dry Weight	Analyzed: 13-Aug-13
<b>Sample ID: 21943-R1</b>	<b>Area B Top Comp 7/31/13 @ 09:40</b>	<b>Matrix: Sediment</b>				<b>Received: 02-Aug-13</b>
Percent Solids	Method: SM 2540B NA	Batch ID: C-13093 90.9	0.1	0.1	9:40 % Dry Weight	Analyzed: 13-Aug-13



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## Pyrethroids

## ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
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**Sample ID: 21940-R1**    **LA - 3 Ref 7/30/13 @ 12:12**    **Matrix: Sediment**    **Sampled: 30-Jul-13**    **12:12**    **Received: 02-Aug-13**  
 Method: EPA 8270C-NCI    Batch ID: O-4142    Prepared: 13-Aug-13    Analyzed: 22-Aug-13

(PCB 112)	NA	92			% Recovery	
(PCB 198)	NA	71			% Recovery	
Allethrin	NA	ND	0.5	2	ng/dry g	
Bifenthrin	NA	ND	0.5	2	ng/dry g	
Cyfluthrin	NA	ND	0.5	2	ng/dry g	
Cypermethrin	NA	ND	0.5	2	ng/dry g	
Danitol (Fenpropathrin)	NA	ND	0.5	2	ng/dry g	
Deltamethrin/Tralomethrin	NA	ND	0.5	2	ng/dry g	
Esfenvalerate	NA	ND	0.5	2	ng/dry g	
Fenvalerate	NA	ND	0.5	2	ng/dry g	
Fluvalinate	NA	ND	0.5	2	ng/dry g	
L-Cyhalothrin	NA	ND	0.5	2	ng/dry g	
Permethrin, cis-	NA	ND	5	10	ng/dry g	
Permethrin, trans-	NA	ND	5	10	ng/dry g	
Prallethrin	NA	ND	0.5	2	ng/dry g	
Resmethrin	NA	ND	5	10	ng/dry g	
Sumithrin	NA	ND	1	5	ng/dry g	
Tetramethrin	NA	ND	1	5	ng/dry g	

**Sample ID: 21941-R1**    **Area A Comp 7/30/13 @ 10:50**    **Matrix: Sediment**    **Sampled: 30-Jul-13**    **10:50**    **Received: 02-Aug-13**  
 Method: EPA 8270C-NCI    Batch ID: O-4142    Prepared: 13-Aug-13    Analyzed: 22-Aug-13

(PCB 112)	NA	104			% Recovery	
(PCB 198)	NA	70			% Recovery	
Allethrin	NA	ND	0.5	2	ng/dry g	
Bifenthrin	NA	ND	0.5	2	ng/dry g	
Cyfluthrin	NA	ND	0.5	2	ng/dry g	
Cypermethrin	NA	ND	0.5	2	ng/dry g	
Danitol (Fenpropathrin)	NA	ND	0.5	2	ng/dry g	
Deltamethrin/Tralomethrin	NA	ND	0.5	2	ng/dry g	
Esfenvalerate	NA	ND	0.5	2	ng/dry g	

PHYSIS Project ID: 1308001-001

Client: NewFields

Project: Balboa Marina



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## Pyrethroids

## ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Fenvalerate	NA	ND	0.5	2	ng/dry g	
Fluvalinate	NA	ND	0.5	2	ng/dry g	
L-Cyhalothrin	NA	ND	0.5	2	ng/dry g	
Permethrin, cis-	NA	ND	5	10	ng/dry g	
Permethrin, trans-	NA	ND	5	10	ng/dry g	
Prallethrin	NA	ND	0.5	2	ng/dry g	
Resmethrin	NA	ND	5	10	ng/dry g	
Sumithrin	NA	ND	1	5	ng/dry g	
Tetramethrin	NA	ND	1	5	ng/dry g	

Sample ID: 21942-R1

Area B Comp 7/30/13 @ 14:43

Matrix: Sediment

Sampled: 30-Jul-13

Received: 02-Aug-13

Method: EPA 8270C-NCI

Prepared: 13-Aug-13

Analyzed: 22-Aug-13

(PCB 112)	NA	107			% Recovery	
(PCB 198)	NA	74			% Recovery	
Allethrin	NA	ND	0.5	2	ng/dry g	
Bifenthrin	NA	ND	0.5	2	ng/dry g	
Cyfluthrin	NA	0.7	0.5	2	ng/dry g	J
Cypermethrin	NA	ND	0.5	2	ng/dry g	
Danitol (Fenpropathrin)	NA	ND	0.5	2	ng/dry g	
Deltamethrin/Tralomethrin	NA	ND	0.5	2	ng/dry g	
Esfenvalerate	NA	ND	0.5	2	ng/dry g	
Fenvalerate	NA	ND	0.5	2	ng/dry g	
Fluvalinate	NA	ND	0.5	2	ng/dry g	
L-Cyhalothrin	NA	ND	0.5	2	ng/dry g	
Permethrin, cis-	NA	ND	5	10	ng/dry g	
Permethrin, trans-	NA	ND	5	10	ng/dry g	
Prallethrin	NA	ND	0.5	2	ng/dry g	
Resmethrin	NA	ND	5	10	ng/dry g	
Sumithrin	NA	ND	1	5	ng/dry g	
Tetramethrin	NA	ND	1	5	ng/dry g	

Sample ID: 21943-R1

Area B Top Comp 7/31/13 @ 09:40

Matrix: Sediment

Sampled: 30-Jul-13

Received: 02-Aug-13

Method: EPA 8270C-NCI

Prepared: 13-Aug-13

Analyzed: 23-Aug-13

PHYSIS Project ID: 1308001-001

Client: NewFields

Project: Balboa Marina



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## Pyrethroids

## ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB 112)	NA	127			% Recovery	
(PCB 198)	NA	79			% Recovery	
Allethrin	NA	ND	0.5	2	ng/dry g	
Bifenthrin	NA	2.5	0.5	2	ng/dry g	
Cyfluthrin	NA	ND	0.5	2	ng/dry g	
Cypermethrin	NA	ND	0.5	2	ng/dry g	
Danitol (Fenpropathrin)	NA	ND	0.5	2	ng/dry g	
Deltamethrin/Tralomethrin	NA	ND	0.5	2	ng/dry g	
Esfenvalerate	NA	ND	0.5	2	ng/dry g	
Fenvalerate	NA	ND	0.5	2	ng/dry g	
Fluvalinate	NA	ND	0.5	2	ng/dry g	
L-Cyhalothrin	NA	1.7	0.5	2	ng/dry g	J
Permethrin, cis-	NA	ND	5	10	ng/dry g	
Permethrin, trans-	NA	ND	5	10	ng/dry g	
Prallethrin	NA	ND	0.5	2	ng/dry g	
Resmethrin	NA	ND	5	10	ng/dry g	
Sumithrin	NA	ND	1	5	ng/dry g	
Tetramethrin	NA	ND	1	5	ng/dry g	

# QUALITY CONTROL REPORT

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## Conventionals

## QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE
-----------	----------	--------	-----	----	-------	-------------	---------------	------------	-------------	---------

### Percent Solids

Method: SM 2540B		Fraction: NA		Prepared: 13-Aug-13		Analyzed: 13-Aug-13				
21939-B1	QAQC Procedural Blank	C-13093	ND	0.1	% Dry Weight	0.1				
21940-R2	LA - 3 Ref	C-13093	46.4	0.1	% Dry Weight	0.1		0	30	PASS



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## Pyrethroids

## QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE
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### Sample ID: 21939-B1

Matrix: DI Water  
Batch ID: O-4142

Sampled:  
Prepared: 13-Aug-13

Received:  
Analyzed: 22-Aug-13

Sample ID: 21939-B1	QAQC Procedural Blank	Method: EPA 8270C-NCI	Matrix: DI Water	Batch ID: O-4142	Sampled:	Prepared: 13-Aug-13	Received:	Analyzed: 22-Aug-13
(PCB 112)	NA	101	% Recovery	100	% Recovery	101	50 - 150%	PASS
(PCB 198)	NA	97	% Recovery	100	% Recovery	97	50 - 150%	PASS
Allethrin	NA	ND	0.5	2	ng/dry g			
Bifenthrin	NA	ND	0.5	2	ng/dry g			
Cyfluthrin	NA	ND	0.5	2	ng/dry g			
Cypermethrin	NA	ND	0.5	2	ng/dry g			
Danitol (Fenpropathrin)	NA	ND	0.5	2	ng/dry g			
Deltamethrin/Tralomethrin	NA	ND	0.5	2	ng/dry g			
Esfenvalerate	NA	ND	0.5	2	ng/dry g			
Fenvalerate	NA	ND	0.5	2	ng/dry g			
Fluvalinate	NA	ND	0.5	2	ng/dry g			
L-Cyhalothrin	NA	ND	0.5	2	ng/dry g			
Permethrin, cis-	NA	ND	5	10	ng/dry g			
Permethrin, trans-	NA	ND	5	10	ng/dry g			
Prallethrin	NA	ND	0.5	2	ng/dry g			
Resmethrin	NA	ND	5	10	ng/dry g			
Sumithrin	NA	ND	1	5	ng/dry g			
Tetramethrin	NA	ND	1	5	ng/dry g			

### Sample ID: 21939-BS1

Matrix: DI Water  
Batch ID: O-4142

Sampled:  
Prepared: 13-Aug-13

Received:  
Analyzed: 22-Aug-13

Sample ID: 21939-BS1	QAQC Procedural Blank	Method: EPA 8270C-NCI	Matrix: DI Water	Batch ID: O-4142	Sampled:	Prepared: 13-Aug-13	Received:	Analyzed: 22-Aug-13
(PCB 112)	NA	92	% Recovery	100	% Recovery	92	50 - 150%	PASS
(PCB 198)	NA	95	% Recovery	100	% Recovery	95	50 - 150%	PASS
Allethrin	NA	947.1	0.5	2	ng/dry g	95	50 - 150%	PASS
Bifenthrin	NA	1274.9	0.5	2	ng/dry g	127	50 - 150%	PASS
Cyfluthrin	NA	976.1	0.5	2	ng/dry g	98	50 - 150%	PASS
Cypermethrin	NA	947.1	0.5	2	ng/dry g	95	50 - 150%	PASS
Danitol (Fenpropathrin)	NA	1362.3	0.5	2	ng/dry g	136	50 - 150%	PASS
Deltamethrin/Tralomethrin	NA	1925.4	0.5	2	ng/dry g	96	50 - 150%	PASS

PHYSIS Project ID: 1308001-001

Client: NewFields

Project: Balboa Marina





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## Pyrethroids

## QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE
Esfenvalerate	NA	892.5	0.5	2	ng/dry g	1000	0	89	50 - 150%	PASS
Fenvalerate	NA	936.4	0.5	2	ng/dry g	1000	0	94	50 - 150%	PASS
Fluvalinate	NA	847.3	0.5	2	ng/dry g	1000	0	85	50 - 150%	PASS
L-Cyhalothrin	NA	1081.8	0.5	2	ng/dry g	1000	0	108	50 - 150%	PASS
Permethrin, cis-	NA	1022.1	5	10	ng/dry g	1000	0	102	50 - 150%	PASS
Permethrin, trans-	NA	1139.4	5	10	ng/dry g	1000	0	114	50 - 150%	PASS
Prallethrin	NA	1098.4	0.5	2	ng/dry g	1000	0	110	50 - 150%	PASS
Resmethrin	NA	1071.4	5	10	ng/dry g	1000	0	107	50 - 150%	PASS
Sumithrin	NA	ND0	1	5	ng/dry g	1000	0	0	0 - 100%	PASS
Tetramethrin	NA	1484	1	5	ng/dry g	1000	0	148	50 - 150%	PASS

### Sample ID: 21939-BS2

### QA/QC Procedural Blank

Method: EPA 8270C-NCI

### Matrix: DI Water

Batch ID: O-4142

### Sampled:

Prepared: 13-Aug-13

### Received:

Analyzed: 22-Aug-13

(PCB 112)	NA	95			% Recovery	100	0	95	50 - 150%	PASS	3	30	PASS
(PCB 198)	NA	89			% Recovery	100	0	89	50 - 150%	PASS	7	30	PASS
Allethrin	NA	910.7	0.5	2	ng/dry g	1000	0	91	50 - 150%	PASS	4	30	PASS
Bifenthrin	NA	1480.8	0.5	2	ng/dry g	1000	0	148	50 - 150%	PASS	15	30	PASS
Cyfluthrin	NA	899.5	0.5	2	ng/dry g	1000	0	90	50 - 150%	PASS	9	30	PASS
Cypermethrin	NA	860.1	0.5	2	ng/dry g	1000	0	86	50 - 150%	PASS	10	30	PASS
Danitol (Fenprothrin)	NA	1235.7	0.5	2	ng/dry g	1000	0	124	50 - 150%	PASS	9	30	PASS
Deltamethrin/Tralomethrin	NA	1880.2	0.5	2	ng/dry g	2000	0	94	50 - 150%	PASS	2	30	PASS
Esfenvalerate	NA	856.6	0.5	2	ng/dry g	1000	0	86	50 - 150%	PASS	3	30	PASS
Fenvalerate	NA	882.7	0.5	2	ng/dry g	1000	0	88	50 - 150%	PASS	7	30	PASS
Fluvalinate	NA	834.6	0.5	2	ng/dry g	1000	0	83	50 - 150%	PASS	2	30	PASS
L-Cyhalothrin	NA	994.9	0.5	2	ng/dry g	1000	0	99	50 - 150%	PASS	9	30	PASS
Permethrin, cis-	NA	934.7	5	10	ng/dry g	1000	0	93	50 - 150%	PASS	9	30	PASS
Permethrin, trans-	NA	1051.4	5	10	ng/dry g	1000	0	105	50 - 150%	PASS	8	30	PASS
Prallethrin	NA	1058.8	0.5	2	ng/dry g	1000	0	106	50 - 150%	PASS	4	30	PASS
Resmethrin	NA	1055.8	5	10	ng/dry g	1000	0	106	50 - 150%	PASS	1	30	PASS
Sumithrin	NA	ND0	1	5	ng/dry g	1000	0	0	0 - 100%	PASS	0	30	PASS
Tetramethrin	NA	1562.6	1	5	ng/dry g	1000	0	156	50 - 150%	FAIL	5	30	PASS

PHYSIS Project ID: 1308001-001

Client: NewFields

Project: Balboa Marina



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## Pyrethroids

## QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE
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Sample ID: 21940-MS1    LA - 3 Ref 7/30/13 @ 12:12  
Method: EPA 8270C-NCI

Matrix: Sediment    Batch ID: O-4142  
Sampled: 30-Jul-13    12:12    Received: 02-Aug-13  
Prepared: 13-Aug-13    Analyzed: 22-Aug-13

(PCB 112)	NA	105			% Recovery	100	0	105	50 - 150%	PASS
(PCB 198)	NA	73			% Recovery	100	0	73	50 - 150%	PASS
Allethrin	NA	174.2	0.5	2	ng/dry g	140.2	0	124	50 - 150%	PASS
Bifenthrin	NA	448.3	0.5	2	ng/dry g	140.2	0	320	50 - 150%	FAIL
Cyfluthrin	NA	100.7	0.5	2	ng/dry g	140.2	0	72	50 - 150%	PASS
Cypermethrin	NA	95.6	0.5	2	ng/dry g	140.2	0	68	50 - 150%	PASS
Danitol (Fenpropathrin)	NA	199.6	0.5	2	ng/dry g	140.2	0	142	50 - 150%	PASS
Deltamethrin/Tralomethrin	NA	133.6	0.5	2	ng/dry g	280.4	0	48	50 - 150%	FAIL
Esfenvalerate	NA	85.8	0.5	2	ng/dry g	140.2	0	61	50 - 150%	PASS
Fenvalerate	NA	92.6	0.5	2	ng/dry g	140.2	0	66	50 - 150%	PASS
Fluvalinate	NA	71.4	0.5	2	ng/dry g	140.2	0	51	50 - 150%	PASS
L-Cyhalothrin	NA	132.6	0.5	2	ng/dry g	140.2	0	95	50 - 150%	PASS
Permethrin, cis-	NA	125.7	5	10	ng/dry g	140.2	0	90	50 - 150%	PASS
Permethrin, trans-	NA	132.1	5	10	ng/dry g	140.2	0	94	50 - 150%	PASS
Prallethrin	NA	267.6	0.5	2	ng/dry g	140.2	0	191	50 - 150%	FAIL
Resmethrin	NA	ND0	5	10	ng/dry g	140.2	0	0	50 - 150%	FAIL
Sumithrin	NA	ND0	1	5	ng/dry g	140.2	0	0	0 - 100%	PASS
Tetramethrin	NA	321.5	1	5	ng/dry g	140.2	0	229	50 - 150%	FAIL

Sample ID: 21940-MS2    LA - 3 Ref 7/30/13 @ 12:12  
Method: EPA 8270C-NCI

Matrix: Sediment    Batch ID: O-4142  
Sampled: 30-Jul-13    12:12    Received: 02-Aug-13  
Prepared: 13-Aug-13    Analyzed: 22-Aug-13

(PCB 112)	NA	104			% Recovery	100	0	104	50 - 150%	PASS
(PCB 198)	NA	80			% Recovery	100	0	80	50 - 150%	PASS
Allethrin	NA	174.3	0.5	2	ng/dry g	143.4	0	122	50 - 150%	PASS
Bifenthrin	NA	448	0.5	2	ng/dry g	143.4	0	312	50 - 150%	FAIL
Cyfluthrin	NA	107.9	0.5	2	ng/dry g	143.4	0	75	50 - 150%	PASS
Cypermethrin	NA	106	0.5	2	ng/dry g	143.4	0	74	50 - 150%	PASS
Danitol (Fenpropathrin)	NA	209.8	0.5	2	ng/dry g	143.4	0	146	50 - 150%	PASS
Deltamethrin/Tralomethrin	NA	140.9	0.5	2	ng/dry g	286.8	0	49	50 - 150%	FAIL

PHYSIS Project ID: 1308001-001

Client: NewFields

Project: Balboa Marina



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## Pyrethroids

## QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE
						LEVEL	RESULT	LIMITS	LIMITS	
Esfenvalerate	NA	91.7	0.5	2	ng/dry g	143.4	0	64 50 - 150%	5 30 PASS	
Fenvalerate	NA	99.7	0.5	2	ng/dry g	143.4	0	70 50 - 150%	6 30 PASS	
Fluvalinate	NA	71.8	0.5	2	ng/dry g	143.4	0	50 50 - 150%	2 30 PASS	
L-Cyhalothrin	NA	141.9	0.5	2	ng/dry g	143.4	0	99 50 - 150%	4 30 PASS	
Permethrin, cis-	NA	139.2	5	10	ng/dry g	143.4	0	97 50 - 150%	7 30 PASS	
Permethrin, trans-	NA	161.3	5	10	ng/dry g	143.4	0	112 50 - 150%	17 30 PASS	
Prallethrin	NA	274.9	0.5	2	ng/dry g	143.4	0	192 50 - 150%	1 30 PASS	M
Resmethrin	NA	ND0	5	10	ng/dry g	143.4	0	0 50 - 150%	0 30 PASS	M
Sumithrin	NA	ND0	1	5	ng/dry g	143.4	0	0 0 - 100%	0 30 PASS	
Tetramethrin	NA	344	1	5	ng/dry g	143.4	0	240 50 - 150%	5 30 PASS	M

### Sample ID: 21940-R2

### LA - 3 Ref 7/30/13 @ 12:12

Method: EPA 8270C-NCI

### Matrix: Sediment

Batch ID: O-4142

### Sampled: 30-Jul-13

Prepared: 13-Aug-13

### 12:12

### Received: 02-Aug-13

Analyzed: 22-Aug-13

(PCB 112)	NA	94			% Recovery	100		94 50 - 150%	2 30 PASS	
(PCB 198)	NA	69			% Recovery	100		69 50 - 150%	3 30 PASS	
Allethrin	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Bifenthrin	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Cyfluthrin	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Cypermethrin	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Danitol (Fenprothrin)	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Deltamethrin/Tralomethrin	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Esfenvalerate	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Fenvalerate	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Fluvalinate	NA	ND	0.5	2	ng/dry g				0 30 PASS	
L-Cyhalothrin	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Permethrin, cis-	NA	ND	5	10	ng/dry g				0 30 PASS	
Permethrin, trans-	NA	ND	5	10	ng/dry g				0 30 PASS	
Prallethrin	NA	ND	0.5	2	ng/dry g				0 30 PASS	
Resmethrin	NA	ND	5	10	ng/dry g				0 30 PASS	
Sumithrin	NA	ND	1	5	ng/dry g				0 30 PASS	
Tetramethrin	NA	ND	1	5	ng/dry g				0 30 PASS	

# CHAIN OF CUSTODY

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# CHAIN OF CUSTODY

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NewFields Northwest, LLC.  
 Shipping: 4729 NE View Dr.  
 Mailing: P.O. Box 216  
 Port Gamble, WA, 98364  
 Tel: (360) 297-6040, Fax: (360) 297-7268



Destination Lab: <b>Physis</b> Destination Contact: <b>Misty Mercier</b> Date: <b>8/11/13</b> Turn-Around-Time: <b>NA</b>		Sample Originator: <b>NewFields</b> Contact Name: <b>Bill Gardiner</b> Address: <b>Same as above</b>		Report Results To: <b>NewFields</b> Contact Name: <b>Bill Gardiner</b> Address: <b>Same as above</b>		Phone: <b>360.297.6080</b> Fax: <b>360.297.7268</b> Email: <b>bgardiner@newfields.com</b>	
Project Name: <b>Balboa Marina West</b> Contract/PO: <b>NA</b>		Invoicing To: <b>NewFields</b> Comments or Special Instructions:		Analysis:		Invoicing To: <b>NewFields</b> Comments or Special Instructions:	
No.	Sample ID	Matrix	No. & Type of Container	Date & Time	Preservation	Sample Temp Upon Receipt	LAB ID
1	LA-3 Ref	SS	1 G	7/18/13 1212	4°C		
2	Area A Camp	↓	↓	7/18/13 1050	↓		
3	Area B Camp	↓	↓	7/18/13 1443	↓		
4	Area B Top Camp	↓	↓	7/13/13 0940			
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Print Name: **Mary Bacon** Relinquished by: **Adam J. Bell** Received by: **Adam J. Bell** Matrix Codes: FW = Fresh Water, MW = Waste Water, SB = Salt & Brackish Water, SS = Soil & Sediment, TS = part & Animal Tissue, OT = Other

Signature: **M. Bacon** Signature: **Adam J. Bell** Signature: **Adam J. Bell**

Affiliation: **NewFields.** Affiliation: **Physis** Affiliation: **Physis**

Date/Time: **8/11/13 0900** Date/Time: **8/13 10:45** Date/Time: **8/13 10:45**

WHITE - return to originator • YELLOW - lab • PINK - received by originator

## SAMPLE RECEIPT SUMMARY

CLIENT:                     New Fields                          Date Received:                     8/2/13                          Received By:                     AI                          Inspected By:                     AI                    

**COURIER**

PHYSIS     CLIENT     FEDEX     UPS

start \_\_\_\_\_ end \_\_\_\_\_     OTHER: \_\_\_\_\_

**COOLER**

COOLER     BOX    total #

OTHER: \_\_\_\_\_                        1                    

**TEMPERATURE**

                    8.6                     °C     WET ICE     BLUE ICE

DRY ICE     NONE

**SAMPLE INTEGRITY UPON RECEIPT**

1. COC(s) included and completely filled out..... **YES**
2. All sample containers arrived intact..... **YES**
3. All samples listed on COC(s) are present..... **YES**
4. Information on containers consistent with information on COC(s)..... **YES**
5. Correct containers and volume for all analyses indicated..... **YES**
6. All samples received within method holding time..... **YES**
7. Correct preservation used for all analyses indicated..... **NO; see notes below**

**NOTES**

see temp

## **Appendix D**

### ***Balboa Marina West Sediment Evaluation***

### **Bioassay and Bioaccumulation Test Data Sheets**

**Balboa Marina West**

**Amphipod Test Benchsheets**





10-DAY SOLID PHASE TEST OBSERVATION DATA

CLIENT		PROJECT		SPECIES		NEWFIELDS LABORATORY		PROTOCOL																		
City of Newport NEWFIELDS JOB NUMBER 860.0100.000		Balboa Marina West PROJECT MANAGER B. Gardiner		Ampellicia abdita TEST START DATE 20-Aug-13		Port Gamble Bath 9 TEST END DATE 30-Aug-13		USEPA/USCOE 1991																		
#E = Emergence #M = Number of Mortality G = Growth (fungal, bacterial, or algae) D = No Air Flow (DO?) N = Normal E = floating	Initial # of Organisms	Rep	Jar #	ENDPOINT DATA AND OBSERVATIONS										Number Alive												
				Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10													
		Date	Technician	Date	Technician	Date	Technician	Date	Technician	Date	Technician	Date	Technician	Date	Technician	Date	Technician									
	10			8/21	JK	8/22	JK	8/23	MMS	8/24	JU	8/25	JU	8/26	MMS	8/27	MMS	8/28	MMS	8/29	JK	8/30	JL	20		
		1	4		N		N		N		N		N		N		N		N		N		N		N	17
		2	18																							18
		3	8																							18
		4	16																							17
		5	22																							18
		1	19																							19
		2	21																							18
		3	2																							18
		4	13																							17
		5	3																							18
		1	14																							19
		2	11																							19
		3	17																							17 IM
		4	6																							17
		5	9																							17 IM
		1	7																							17
		2	10																							17
		3	24																							17
		4	15																							17
		5	20																							17

# 10 DAY SOLID PHASE BIOASSAY WATER QUALITY DATA SHEET

<b>CLIENT</b> City of Newport	<b>PROJECT</b> Baiboa Marina West
<b>NEWFIELDS JOB NUMBER</b> 860.0100.000	<b>PROJECT MANAGER</b> B. Gardiner

<b>SPECIES</b> <i>Ampelisca abdita</i>	<b>NEWFIELDS LABORATORY</b> Port Gamble Bath 9
<b>TEST START DATE</b> 20-Aug-13	<b>TEST END DATE</b> 30-Aug-13
<b>TIME</b>	

<b>PROTOCOL</b> USEPAUSCOE 1991	<b>TIME</b>
------------------------------------	-------------

Client/NewFields ID		Day		Rep		Test Conditions		DO (mg/L)		Temperature (°C)		Salinity (ppt)		pH		Tech	Date
								meter	mg/L	meter	deg C	meter	ppt	meter	unit		
Control		0		Surr.	1	6	7.3	6	19.0	2	30	5	7.8	JL	8/20/13		
Control		1		Surr.	1	6	7.4	6	19.9	2	30	5	7.8	MMMB	8/21		
Control		2		Surr.	1	6	7.3	6	20.0	2	30	5	7.9	MMMB	8/22		
Control		3		Surr.	1	6	7.3	6	20.2	2	30	5	7.9	MMMB	8/23		
Control		4		Surr.	1	6	7.5	6	20.1	2	30	5	8.2	JL	8/24		
Control		5		Surr.	1	6	7.5	6	20.1	2	30	5	8.1	JL	8/25		
Control		6		Surr.	1	6	7.3	6	20.6	2	30	5	8.0	MMMB	8/26		
Control		7		Surr.	1	6	7.7	6	19.8	2	30	5	8.4	MMMB	8/27		
Control		8		Surr.	1	6	7.5	6	19.8	2	30	5	8.2	MMMB	8/28		
Control		9		Surr.	1	6	7.5	6	20.1	2	30	5	7.9	MMMB	8/29		
Control		10		Surr.	1	6	7.4	6	20.1	2	30	5	8.1	JL	8/30		
LA-3 Ref		0		Surr.	5	6	7.7	6	19.2	2	31	5	8.0	JL	8/26/13		
LA-3 Ref		1		Surr.	5	6	7.6	6	20.0	2	31	5	8.0	MMMB	8/27		
LA-3 Ref		2		Surr.	5	6	7.3	6	20.6	2	31	5	7.9	MMMB	8/27		
LA-3 Ref		3		Surr.	5	6	7.3	6	20.2	2	31	5	7.9	MMMB	8/23		
LA-3 Ref		4		Surr.	5	6	7.4	6	20.1	2	31	5	8.1	JL	8/24		
LA-3 Ref		5		Surr.	5	6	7.2	6	20.2	2	31	5	8.1	JL	8/25		
LA-3 Ref		6		Surr.	5	6	7.2	6	20.0	2	31	5	8.0	MMMB	8/26		
LA-3 Ref		7		Surr.	5	6	7.6	6	19.9	2	31	5	8.3	MMMB	8/27		
LA-3 Ref		8		Surr.	5	6	7.4	6	19.9	2	31	5	8.1	MMMB	8/28		
LA-3 Ref		9		Surr.	5	6	7.5	6	20.2	2	31	5	7.9	MMMB	8/29		
LA-3 Ref		10		Surr.	5	6	7.4	6	20.1	2	31	5	8.1	JL	8/30		



10 DAY SOLID PHASE BIOASSAY  
WATER QUALITY DATA SHEET

CLIENT	PROJECT
City of Newport	Balboa Marina West
NEWFIELDS JOB NUMBER	PROJECT MANAGER
860.0100.000	B. Gardiner

SPECIES	NEWFIELDS LABORATORY	PROTOCOL
Ampelisca abdita	Port Gamble Bath 9	USEPA/USCOE 1991
TEST START DATE	TEST END DATE	TIME
20-Aug-13	30-Aug-13	

Client/NewFields ID	Test Conditions		DO (mg/L)		Temperature (°C)		Salinity (ppt)		pH		Tech	Date
	Day	Rep	meter	mg/L	meter	deg C	meter	ppt	meter	unit		
Area A-Comp	0	Surr.	6	7.6	6	19.3	2	30	5	8.0	JL	8/20/13
Area A-Comp	1	Surr.	6	6.9	6	20.0	2	31	5	7.8	MMMS	8/21
Area A-Comp	2	Surr.	6	7.2	6	20.1	2	30	5	7.9	MMMS	8/22
Area A-Comp	3	Surr.	6	7.2	6	20.2	2	30	5	7.8	MMMS	8/23
Area A-Comp	4	Surr.	6	7.5	6	20.1	2	30	5	8.1	JL	8/24
Area A-Comp	5	Surr.	6	6.3	6	20.4	2	30	5	8.0	JL	8/25
Area A-Comp	6	Surr.	6	6.0	6	20.1	2	30	5	7.9	MMMS	8/26
Area A-Comp	7	Surr.	6	7.4	6	19.7	2	30	5	8.4	AK	8/27
Area A-Comp	8	Surr.	6	7.3	6	19.9	2	30	5	8.1	MMMS	8/28
Area A-Comp	9	Surr.	6	7.4	6	20.2	2	30	5	7.8	AK	8/29
Area A-Comp	10	Surr.	6	7.3	6	20.0	2	30	5	8.0	JL	8/30
Area B-Comp	0	Surr.	6	7.7	6	19.1	2	31	5	8.0	JL	8/20/13
Area B-Comp	1	Surr.	6	7.4	6	20.0	2	31	5	8.0	MMMS	8/21
Area B-Comp	2	Surr.	6	7.4	6	20.0	2	31	5	8.0	MMMS	8/22
Area B-Comp	3	Surr.	6	7.4	6	20.2	2	31	5	8.0	MMMS	8/23
Area B-Comp	4	Surr.	6	7.5	6	20.2	2	31	5	8.2	JL	8/24
Area B-Comp	5	Surr.	6	7.3	6	20.2	2	31	5	8.1	JL	8/25
Area B-Comp	6	Surr.	6	7.3	6	20.1	2	31	5	8.0	MMMS	8/26
Area B-Comp	7	Surr.	6	7.2	6	19.6	2	31	5	8.5	AK	8/27
Area B-Comp	8	Surr.	6	7.3	6	20.0	2	31	5	8.1	MMMS	8/28
Area B-Comp	9	Surr.	6	7.4	6	20.1	2	31	5	7.7	AK	8/29
Area B-Comp	10	Surr.	6	7.4	6	20.1	2	31	5	8.1	JL	9/30

DWC:AK 8/29



## Ammonia and Sulfide Analysis Record

Client/Project: Balboa	Organism: AMP	Test Duration (days): 10
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PRETEST / INITIAL / FINAL / OTHER (circle one) DAY of TEST: 10  
OVERLYING (OV) / POREWATER (PW) (circle one)

Comments: \_\_\_\_\_

Calibration Standards Temperature		Sample temperature should be within $\pm 1^\circ\text{C}$ of standards temperature at time and date of analysis.
Date:	Temperature:	
8/30/13	20.8	

Sample ID or Description	Conc. or Rep	Date of Sampling and Initials	Ammonia Value (mg/L)	Temp °C	Date of Reading and Initials	Sample Preserved (Y/N)	pH	Sal (ppt)	Sulf. mg/L
OV Control	Surr	8/30/13 JL	0.368	21.0	7/2 8/30	N	/		/
La 3 ref	↓	↓	0.0947	↓		↓			
A Comp	↓	↓	0.119	↓		↓			
B Comp	↓	↓	0.0951	↓		↓			
PW Control	Surr	8/31/13 JL	0.393	21.3	8/31/13 JL	N	7.3	29	/
LA.5 Ref	Surr	↓	0.118	↓	↓	↓	7.6	30	
A Comp	↓	↓	①	↓	↓	↓	→		
B Comp	↓	↓	0.0352	↓	↓	↓	7.7	28	

① Chamber broken down for use in survival counts. JL 8/31/13.

# NewFields

## ORGANISM RECEIPT LOG

Date: 8.15.13		Time: 1500		NewFields Batch No. JB 8024		
Organism / Project: Ampelisca				Invoice Attached Yes <input type="radio"/> No <input checked="" type="radio"/>		
Source / Supplier: Brezina & Assoc.				Contact: John Brezina		
No. Ordered: 1950		No. Received: 1950 +		Source Batch: (Collection date, hatch date, etc.): Field		
Condition of Organisms: (Good, fair, poor; describe.): Good				Approximate Size or Age: (Days from hatch, life stage, size class, etc.): 3-5mm immature		
Shipper: FedEx				B of L (Tracking No.) 8017 2191 8024		
Condition of Container: (Good, fair, poor; describe.): Good				Received By: BH		
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	Number Dead or Moribund	Technician (Initials)
1	720	18.4	27	7.1	—	BH
Notes:						

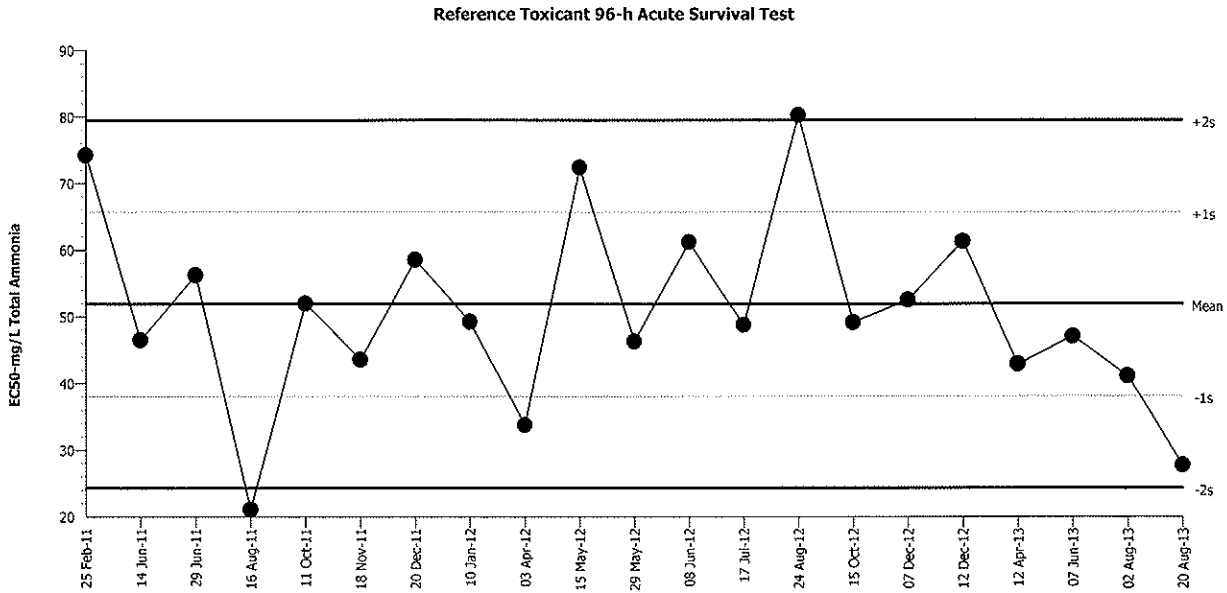
Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival  
Protocol: PSEP (1995)

Organism: Ampelisca abdita (Amphipod)  
Endpoint: Proportion Survived

Material: Total Ammonia  
Source: Reference Toxicant-REF



Mean: 51.9      Count: 20      -1s Warning Limit: 38.11      -2s Action Limit: 24.32  
 Sigma: 13.79      CV: 26.60%      +1s Warning Limit: 65.69      +2s Action Limit: 79.48

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Feb	25	15:45	74.24	22.34	1.62	(+)		03-2055-3347	20-6886-9535
2		Jun	14	17:15	46.53	-5.372	-0.3896			09-1868-5874	01-9106-6226
3			29	16:15	56.23	4.332	0.3141			14-9305-3005	00-0226-7997
4		Aug	16	16:45	21.09	-30.81	-2.234	(-)	(-)	06-9854-2879	12-5356-8506
5		Oct	11	16:20	51.94	0.03739	0.002711			01-0904-0691	15-3443-3527
6		Nov	18	15:50	43.54	-8.363	-0.6065			12-2254-4742	02-4222-9494
7		Dec	20	16:00	58.51	6.614	0.4796			14-0527-6203	15-6286-1591
8	2012	Jan	10	13:20	49.25	-2.654	-0.1924			03-9063-0419	13-1863-6806
9		Apr	3	15:30	33.8	-18.1	-1.313	(-)		08-8729-6483	12-0478-0020
10		May	15	15:35	72.39	20.49	1.486	(+)		19-7667-7405	14-3535-3938
11			29	16:30	46.32	-5.584	-0.405			03-7733-4362	00-5524-0466
12		Jun	8	13:20	61.19	9.286	0.6734			13-8637-6080	02-7852-3336
13		Jul	17	15:35	48.77	-3.135	-0.2273			13-6908-0253	15-9441-6932
14		Aug	24	16:00	80.22	28.32	2.054	(+)	(+)	05-1157-3267	06-6926-6880
15		Oct	15	14:05	49.17	-2.734	-0.1982			20-5208-6497	10-3695-2553
16		Dec	7	14:10	52.54	0.6414	0.04651			09-7213-1371	16-2148-8780
17			12	14:35	61.3	9.402	0.6818			09-4120-7349	01-5095-3015
18	2013	Apr	12	15:10	42.89	-9.01	-0.6534			12-7034-8436	01-8907-2059
19		Jun	7	14:27	47.05	-4.849	-0.3516			09-6757-3966	14-2869-9159
20		Aug	2	14:30	41.11	-10.79	-0.7828			19-9079-9629	15-4478-6705
21			20	16:00	27.72	-24.18	-1.754	(-)		13-7509-8421	14-8949-6958

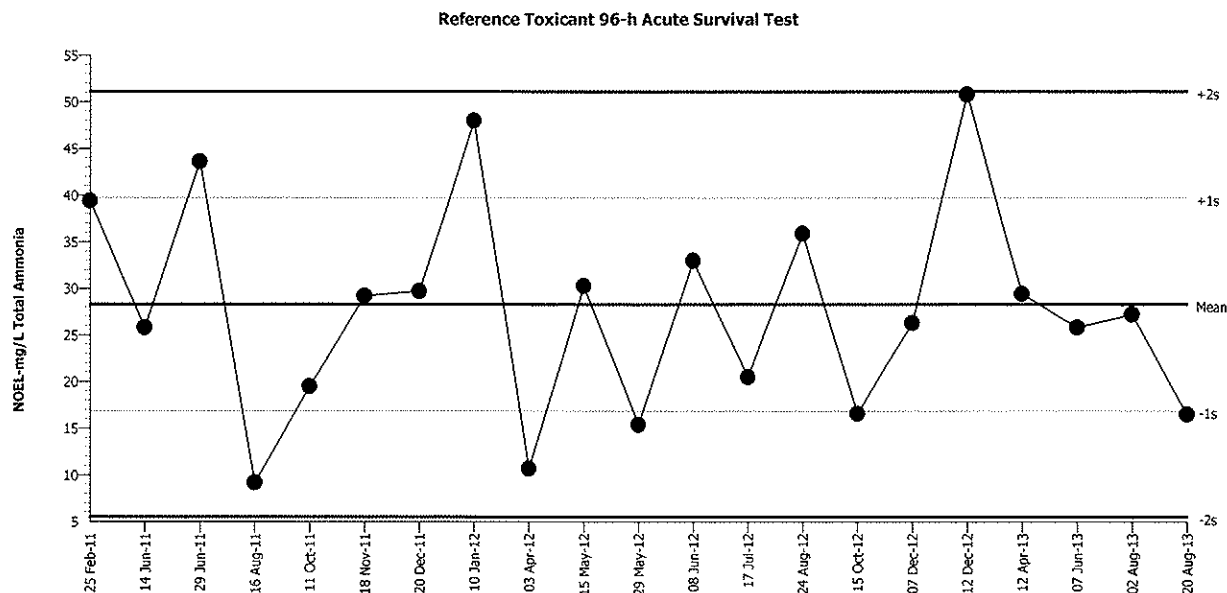
Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival  
Protocol: PSEP (1995)

Organism: Ampelisca abdita (Amphipod)  
Endpoint: Proportion Survived

Material: Total Ammonia  
Source: Reference Toxicant-REF



Mean: 28.31      Count: 20      -1s Warning Limit: 16.9      -2s Action Limit: 5.49  
 Sigma: 11.41      CV: 40.30%      +1s Warning Limit: 39.72      +2s Action Limit: 51.13

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Feb	25	15:45	39.4	11.09	0.972			03-2055-3347	18-6946-0904
2		Jun	14	17:15	25.8	-2.51	-0.22			09-1868-5874	08-4613-6849
3			29	16:15	43.6	15.29	1.34	(+)		14-9305-3005	02-2254-3879
4		Aug	16	16:45	9.19	-19.12	-1.676	(-)		06-9854-2879	01-4256-2767
5		Oct	11	16:20	19.5	-8.81	-0.7721			01-0904-0691	03-2353-8601
6		Nov	18	15:50	29.2	0.89	0.078			12-2254-4742	16-1204-1880
7		Dec	20	16:00	29.7	1.39	0.1218			14-0527-6203	01-1824-3598
8	2012	Jan	10	13:20	48	19.69	1.726	(+)		03-9063-0419	05-6146-2767
9		Apr	3	15:30	10.7	-17.61	-1.543	(-)		08-8729-6483	21-1434-6496
10		May	15	15:35	30.3	1.99	0.1744			19-7667-7405	08-1012-4639
11			29	16:30	15.4	-12.91	-1.131	(-)		03-7733-4362	15-2881-2817
12		Jun	8	13:20	33	4.69	0.411			13-8637-6080	11-0166-8393
13		Jul	17	15:35	20.5	-7.81	-0.6845			13-6908-0253	01-0052-5043
14		Aug	24	16:00	35.9	7.59	0.6652			05-1157-3267	08-5831-5485
15		Oct	15	14:05	16.6	-11.71	-1.026	(-)		20-5208-6497	00-9472-6466
16		Dec	7	14:10	26.3	-2.01	-0.1762			09-7213-1371	15-3724-7545
17			12	14:35	50.8	22.49	1.971	(+)		09-4120-7349	14-7366-3468
18	2013	Apr	12	15:10	29.4	1.09	0.09553			12-7034-8436	09-1665-9388
19		Jun	7	14:27	25.8	-2.51	-0.22			09-6757-3966	16-0158-1126
20		Aug	2	14:30	27.2	-1.11	-0.09728			19-9079-9629	14-0752-3636
21			20	16:00	16.5	-11.81	-1.035	(-)		13-7509-8421	21-3120-5219



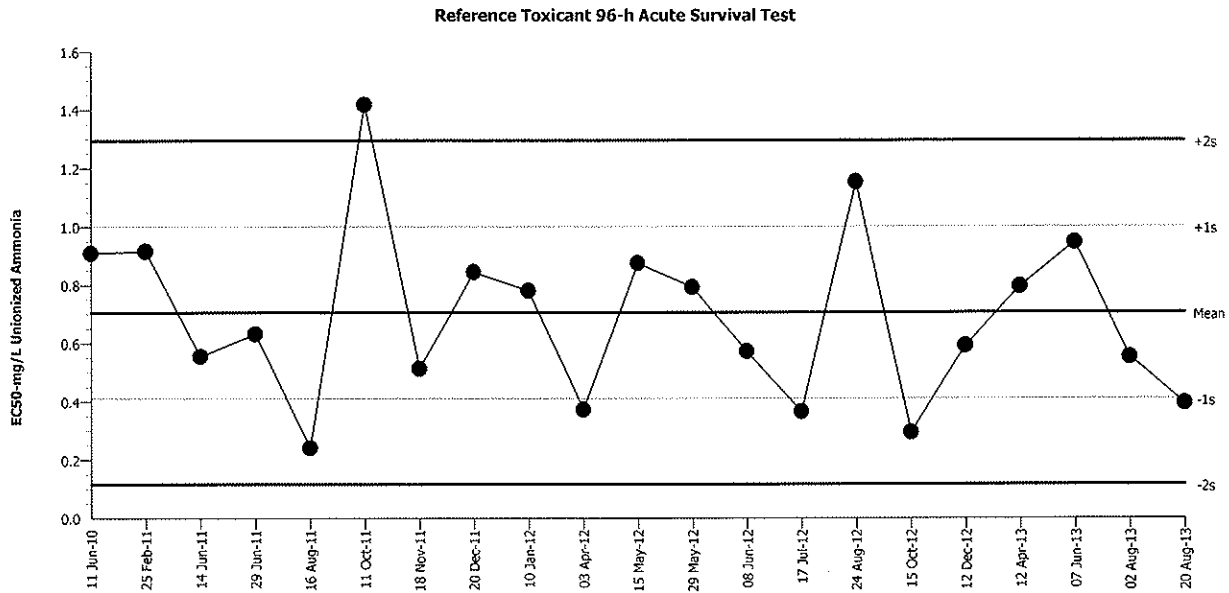
Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival  
Protocol: PSEP (1995)

Organism: Ampelisca abdita (Amphipod)  
Endpoint: Proportion Survived

Material: Unionized Ammonia  
Source: Reference Toxicant-REF



Mean: 0.7058      Count: 20      -1s Warning Limit: 0.4112      -2s Action Limit: 0.1166  
Sigma: 0.2946      CV: 41.70%      +1s Warning Limit: 1      +2s Action Limit: 1.295

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2010	Jun	11	15:00	0.9091	0.2033	0.6902			20-7458-9450	13-8247-7628
2	2011	Feb	25	15:45	0.9162	0.2104	0.7141			09-2688-2854	12-8321-3321
3		Jun	14	17:15	0.555	-0.1508	-0.512			03-9735-4526	03-6206-6429
4			29	16:15	0.6316	-0.07425	-0.252			16-0038-0342	16-2517-1647
5		Aug	16	16:45	0.2412	-0.4646	-1.577	(-)		17-1366-6383	13-9366-5712
6		Oct	11	16:20	1.417	0.7112	2.414	(+)	(+)	03-7596-2776	15-2068-6133
7		Nov	18	15:50	0.5128	-0.193	-0.6551			04-9643-4979	12-9127-7177
8		Dec	20	16:00	0.8443	0.1385	0.4702			03-1982-3174	07-2473-9439
9	2012	Jan	10	13:20	0.7803	0.0745	0.2529			14-0134-9355	05-9622-2552
10		Apr	3	15:30	0.3727	-0.3331	-1.131	(-)		09-4195-0171	16-7041-3249
11		May	15	15:35	0.8746	0.1688	0.5731			19-0654-4665	02-2736-5527
12			29	16:30	0.7925	0.08668	0.2942			16-2142-7193	00-6495-6483
13		Jun	8	13:20	0.5713	-0.1345	-0.4567			16-9847-8166	14-4844-2376
14		Jul	17	15:35	0.3655	-0.3403	-1.155	(-)		16-1062-4289	18-5210-8917
15		Aug	24	16:00	1.153	0.4469	1.517	(+)		08-8752-6542	18-9827-5067
16		Oct	15	14:05	0.2948	-0.411	-1.395	(-)		21-3290-0327	06-9210-9670
17		Dec	12	14:35	0.5915	-0.1143	-0.3881			19-9334-0562	19-2787-5813
18	2013	Apr	12	15:10	0.7944	0.08858	0.3007			18-6740-5427	01-0210-3355
19		Jun	7	14:27	0.9455	0.2397	0.8138			17-9272-1074	09-3984-5720
20		Aug	2	14:30	0.5525	-0.1533	-0.5202			05-2050-2330	19-4439-2397
21			20	16:00	0.3944	-0.3114	-1.057	(-)		00-4509-6567	12-4262-0365

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival

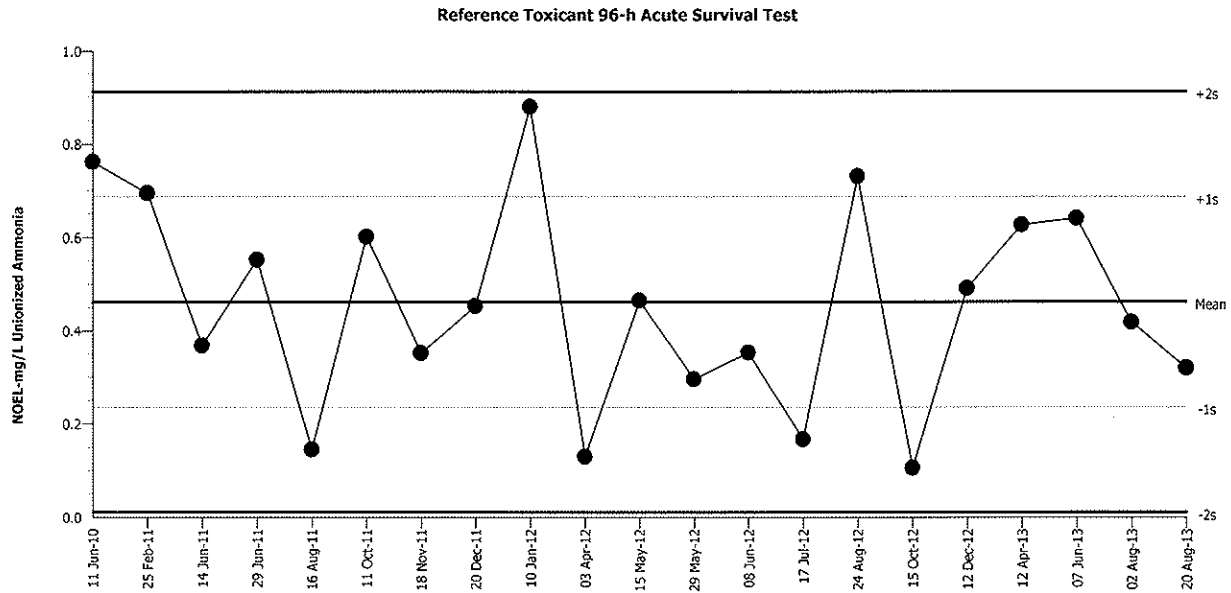
Organism: Ampelisca abdita (Amphipod)

Material: Unionized Ammonia

Protocol: PSEP (1995)

Endpoint: Proportion Survived

Source: Reference Toxicant-REF



Mean: 0.4616      Count: 20      -1s Warning Limit: 0.2361      -2s Action Limit: 0.0106  
 Sigma: 0.2255      CV: 48.90%      +1s Warning Limit: 0.6871      +2s Action Limit: 0.9126

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2010	Jun	11	15:00	0.762	0.3004	1.332	(+)		20-7458-9450	11-3710-8048
2	2011	Feb	25	15:45	0.695	0.2334	1.035	(+)		09-2688-2854	14-0879-4327
3		Jun	14	17:15	0.368	-0.0936	-0.4151			03-9735-4526	14-8243-3209
4			29	16:15	0.552	0.0904	0.4009			16-0038-0342	13-6006-5675
5		Aug	16	16:45	0.145	-0.3166	-1.404	(-)		17-1366-6383	11-0269-0125
6		Oct	11	16:20	0.601	0.1394	0.6182			03-7596-2776	09-5230-7986
7		Nov	18	15:50	0.352	-0.1096	-0.486			04-9643-4979	01-1905-2738
8		Dec	20	16:00	0.453	-0.0086	-0.03814			03-1982-3174	05-0111-8797
9	2012	Jan	10	13:20	0.88	0.4184	1.855	(+)		14-0134-9355	16-9430-9459
10		Apr	3	15:30	0.13	-0.3316	-1.471	(-)		09-4195-0171	03-4555-9841
11		May	15	15:35	0.465	0.0034	0.01508			19-0654-4665	02-1023-3166
12			29	16:30	0.296	-0.1656	-0.7344			16-2142-7193	05-9105-0121
13		Jun	8	13:20	0.353	-0.1086	-0.4816			16-9847-8166	07-7881-0150
14		Jul	17	15:35	0.167	-0.2946	-1.306	(-)		16-1062-4289	06-2935-3737
15		Aug	24	16:00	0.731	0.2694	1.195	(+)		08-8752-6542	06-6737-8668
16		Oct	15	14:05	0.106	-0.3556	-1.577	(-)		21-3290-0327	16-3835-9075
17		Dec	12	14:35	0.491	0.0294	0.1304			19-9334-0562	05-1325-4403
18	2013	Apr	12	15:10	0.627	0.1654	0.7335			18-6740-5427	16-6473-6896
19		Jun	7	14:27	0.641	0.1794	0.7956			17-9272-1074	01-9841-1337
20		Aug	2	14:30	0.418	-0.0436	-0.1933			05-2050-2330	09-8914-1463
21			20	16:00	0.32	-0.1416	-0.6279			00-4509-6567	15-4368-4994

# CETIS Summary Report

Report Date: 19 Nov-13 09:27 (p 1 of 1)  
 Test Code: 51F65635 | 13-7509-8421

## Reference Toxicant 96-h Acute Survival Test

NewFields

Batch ID: 08-8780-9505	Test Type: Survival	Analyst:
Start Date: 20 Aug-13 16:00	Protocol: PSEP (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Aug-13 17:45	Species: Ampelisca abdita	Brine: Not Applicable
Duration: 4d 2h	Source: Brezina and Associates	Age:
Sample ID: 11-4037-0994	Code: 43F8AE32	Client: Internal Lab
Sample Date: 27 Sep-11	Material: Total Ammonia	Project: Reference Toxicant
Receive Date: 27 Sep-11	Source: Reference Toxicant	
Sample Age: 693d 16h	Station: P110927.147	

### Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
21-3120-5219	Proportion Survived	16.5	31.7	22.87	27.5%		Dunnett Multiple Comparison Test

### Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
14-8949-6958	Proportion Survived	EC50	27.72	23.17	33.16		Trimmed Spearman-Kärber

### Proportion Survived Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	0.0%
16.5		3	0.8	0.3032	1	0.6	1	0.1155	0.2	25.0%	17.24%
31.7		3	0.4	0	0.8303	0.3	0.6	0.1	0.1732	43.3%	58.62%
61.9		3	0	0	0	0	0	0	0		100.0%
124		3	0	0	0	0	0	0	0		100.0%
240		3	0	0	0	0	0	0	0		100.0%

### Proportion Survived Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	1	1	0.9
16.5		1	0.8	0.6
31.7		0.3	0.6	0.3
61.9		0	0	0
124		0	0	0
240		0	0	0

### Proportion Survived Binomials

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	10/10	10/10	9/10
16.5		10/10	8/10	6/10
31.7		3/10	6/10	3/10
61.9		0/10	0/10	0/10
124		0/10	0/10	0/10
240		0/10	0/10	0/10

**Balboa Marina West**

**Polychaete Test Benchsheets**

10-DAY SOLID PHASE TEST OBSERVATION DATA

CLIENT		PROJECT		SPECIES		NEWFIELDS LABORATORY		PROTOCOL																
City of Newport		Balboa Marina West		<i>Neorhizus arenaceoindentata</i>		Port Gamble Bath 9		USEPA/USCOE 1991																
NEWFIELDS JOB NUMBER		PROJECT MANAGER		TEST START DATE		TEST END DATE																		
860.0100.000		B. Gardiner		20-Aug-13		30-Aug-13																		
#E = Emergence #M = Number of Mortality G = Growth (fungal, bacterial, or algal) D = No Air Flow (DO?) N = Normal	Initial # of Organisms	Rep	Jar #	ENDPOINT DATA AND OBSERVATIONS										Number Alive										
				Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10											
Client/NewFields ID				Date	Technician	Date	Technician	Date	Technician	Date	Technician	Date	Technician	Date	Technician	Date	Technician							
Control	10	1	4	8/21	✓	8/22	✓	8/23	MWB	8/24	JL	8/25	MWB	8/26	MWB	8/27	MWB	8/28	MWB	8/29	JK	8/30	JL	10
		2	18		N		IE		N		N		N		IE		N		N		N		N	10
		3	8				N																	10
		4	16																					10
		5	22																					10
LA-3 Ref		1	19																					10
		2	21																					10
		3	2																					9
		4	13																					10
		5	3																					10
Area A-Comp		1	14																					9
		2	11																					10
		3	17																					9
		4	6																					10
		5	9																					10
Area B-Comp		1	7																					10
		2	10																					10
		3	24																					10
		4	15																					10
		5	20																					10

# 10 DAY SOLID PHASE BIOASSAY WATER QUALITY DATA SHEET

<b>CLIENT</b> City of Newport	<b>PROJECT</b> Balboa Marina West
<b>NEWFIELDS JOB NUMBER</b> 860.0100.000	<b>PROJECT MANAGER</b> B. Gardiner

<b>SPECIES</b> <i>Nearthes arenaeodentata</i>	<b>NEWFIELDS LABORATORY</b> Port Gamble Bath 9
<b>TEST START DATE</b> 20-Aug-13	<b>TEST END DATE</b> 30-Aug-13
<b>TIME</b> 1100	

<b>PROTOCOL</b> USEPA/USCOE 1991	<b>TIME</b>
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WATER QUALITY DATA														
Client/NewFields ID	Day	Rep	Test Conditions		DO <sub>2</sub> (mg/L)		Temperature (°C)		Salinity (ppt)		pH		Tech	Date
			Jar#	Jar#	meter	mg/L	meter	deg C	meter	ppt	meter	unit		
Control	0	Surr.	1	6	7.4	6	19.4	2	31	5	7.9	JL	8/20/13	
Control	1	Surr.	1	6	7.4	6	19.9	2	31	5	7.8	MMS	8/21	
Control	2	Surr.	1	6	7.3	6	20.0	2	30	5	7.9	MMS	8/22	
Control	3	Surr.	1	6	7.4	6	20.2	2	30	5	7.9	MMS	8/23	
Control	4	Surr.	1	6	7.5	6	20.2	2	30	5	8.2	JL	8/24	
Control	5	Surr.	1	6	7.4	6	20.2	2	31	5	8.2	JL	8/25	
Control	6	Surr.	1	6	7.7	6	20.1	2	30	5	8.0	MMS	8/26	
Control	7	Surr.	1	6	7.7	6	19.7	2	30	5	8.6	HK	8/27	
Control	8	Surr.	1	6	7.5	6	19.8	2	30	5	7.8	MMS	8/28	
Control	9	Surr.	1	6	7.5	6	20.0	2	30	5	7.8	HK	8/28 8/29	
Control	10	Surr.	1	6	7.6	6	20.0	2	30	5	8.1	JL	8/30	
LA-3 Ref	0	Surr.	5	6	7.5	6	19.4	2	31	5	7.9	JL	8/20/13	
LA-3 Ref	1	Surr.	5	6	7.3	6	20.1	2	31	5	7.8	MMS	8/21	
LA-3 Ref	2	Surr.	5	6	7.3	6	20.0	2	31	5	7.9	MMS	8/22	
LA-3 Ref	3	Surr.	5	6	7.3	6	20.2	2	31	5	7.9	MMS	8/23	
LA-3 Ref	4	Surr.	5	6	7.4	6	20.2	2	31	5	8.1	JL	8/24	
LA-3 Ref	5	Surr.	5	6	7.3	6	20.2	2	31	5	8.1	JL	8/25	
LA-3 Ref	6	Surr.	5	6	7.6	6	20.1	2	31	5	7.9	MMS	8/26	
LA-3 Ref	7	Surr.	5	6	7.6	6	19.7	2	31	5	8.5	HK	8/27	
LA-3 Ref	8	Surr.	5	6	7.5	6	19.9	2	31	5	8.0	MMS	8/28	
LA-3 Ref	9	Surr.	5	6	7.5	6	20.2	2	31	5	8.0	HK	8/29	
LA-3 Ref	10	Surr.	5	6	7.5	6	20.0	2	31	5	8.1	JL	8/30	

Dmc, MMS 8/28/13      2 WP HK 8/29



10 DAY SOLID PHASE BIOASSAY  
WATER QUALITY DATA SHEET

CLIENT City of Newport NEWFIELDS JOB NUMBER 860,0100,000	PROJECT Balboa Marina West PROJECT MANAGER B. Gardiner
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SPECIES Neanthes arenaceodentata	NEWFIELDS LABORATORY Port Gamble Bath 9	PROTOCOL USEPA/USCOE 1991
TEST START DATE 20-Aug-13	TEST END DATE 30-Aug-13	TIME
TIME 1100		

Client/NewFields ID	Day	Rep	Jar#	WATER QUALITY DATA										Tech	Date
				DO (mg/L) ±0.2 mg/L		Temperature (°C) ±0.1		Salinity (ppt) ±0.2		pH 6-9		meter	unit		
				meter	mg/L	meter	deg C	meter	ppt	meter	unit				
Area A-Comp	0	Surr.	23	6	7.6	6	19.4	2	30	8	8.0	JL	8/20/13		
Area A-Comp	1	Surr.	23	6	7.4	6	20.1	2	30	5	7.9	MMMS	8/21		
Area A-Comp	2	Surr.	23	6	7.4	6	20.1	2	30	5	7.9	MMMS	8/22		
Area A-Comp	3	Surr.	23	6	7.4	6	20.2	2	30	5	8.0	MMMS	8/23		
Area A-Comp	4	Surr.	23	6	7.5	6	20.2	2	30	5	8.1	JL	8/24		
Area A-Comp	5	Surr.	23	6	7.3	6	20.2	2	30	5	8.2	JL	8/25		
Area A-Comp	6	Surr.	23	6	7.7	6	20.1	2	30	5	8.0	MMMS	8/26		
Area A-Comp	7	Surr.	23	6	7.7	6	19.7	2	30	5	8.5	JK	8/27		
Area A-Comp	8	Surr.	23	6	7.5	6	20.0	2	30	5	8.0	MMMS	8/28		
Area A-Comp	9	Surr.	23	6	7.6	6	20.1	2	30	5	7.9	JK	8/29		
Area A-Comp	10	Surr.	23	6	7.6	6	20.0	2	30	5	8.1	JL	8/30		
Area B-Comp	0	Surr.	12	6	7.6	6	19.4	2	31	5	8.0	JL	8/20/13		
Area B-Comp	1	Surr.	12	6	7.5	6	20.2	2	30	5	7.9	MMMS	8/21		
Area B-Comp	2	Surr.	12	6	7.5	6	20.0	2	30	5	7.9	MMMS	8/22		
Area B-Comp	3	Surr.	12	6	7.5	6	20.2	2	30	5	8.0	MMMS	8/23		
Area B-Comp	4	Surr.	12	6	7.5	6	20.2	2	30	5	8.2	JL	8/24		
Area B-Comp	5	Surr.	12	6	7.4	6	20.2	2	30	5	8.2	JL	8/25		
Area B-Comp	6	Surr.	12	6	7.7	6	20.1	2	30	5	8.0	MMMS	8/26		
Area B-Comp	7	Surr.	12	6	7.7	6	19.7	2	30	5	8.5	JK	8/27		
Area B-Comp	8	Surr.	12	6	7.5	6	20.0	2	30	5	8.1	MMMS	8/28		
Area B-Comp	9	Surr.	12	6	7.5	6	20.1	2	30	5	8.0	JK	8/29		
Area B-Comp	10	Surr.	12	6	7.6	6	20.0	2	30	5	8.1	JL	8/30		

WP JK 8/29









# LABORATORY REPORT TRACKING LOG

CLIENT:	City of Newport Beach	PROJECT NUMBER:	860-0100-000
PROJECT:	Balboa Marina West		
NEWFIELDS PM:	B. Gardiner		
TESTING COMPONENTS:	Nearness		

TEST:	INITIALS AND DATE OF COMPLETION OF TASK				
	COMPLETE	1ST QA	REVISIONS COMPLETE	2ND QA	REVISIONS COMPLETE
10-day					
REVIEW OF BENCH SHEETS	9/05/13 JL				
ENDPOINT DATA ENTRY AND SUMMARY TABLES					
WQ DATA ENTRY AND SUMMARY TABLES					
REFERENCE TOXICANT PACKETS					
STATISTICAL ANALYSES					

# NewFields

## ORGANISM RECEIPT LOG

Date: 8/20/13		Time: 1050		NewFields Batch No. ATS		
Organism / Project: Neanthes / Fort Pierce & BMW				Invoice Attached Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Source / Supplier: Aquatic Toxicological				Contact: On File		
No. Ordered: 700		No. Received: 770		Source Batch: (Collection date, hatch date, etc.): Emerge: 7/26 - 8/2		
Condition of Organisms: (Good, fair, poor; describe.): Good			Approximate Size or Age: (Days from hatch, life stage, size class, etc.): 25-27 days			
Shipper: NF Carrier			B of L (Tracking No.): NA			
Condition of Container: (Good, fair, poor; describe.): Good			Received By: MMS			
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	Number Dead or Moribund	Technician (Initials)
Composite	12.3	19.9	31 ppt	7.2	—	MMS
Notes:						

DO 12.3  
Temp 19.9  
Sal 32.31  
pH 7.2



Aquatic Toxicology Support  
1849 Charleston Beach Road West  
Bremerton, Washington 98312  
(360) 813-1202

Order Summary

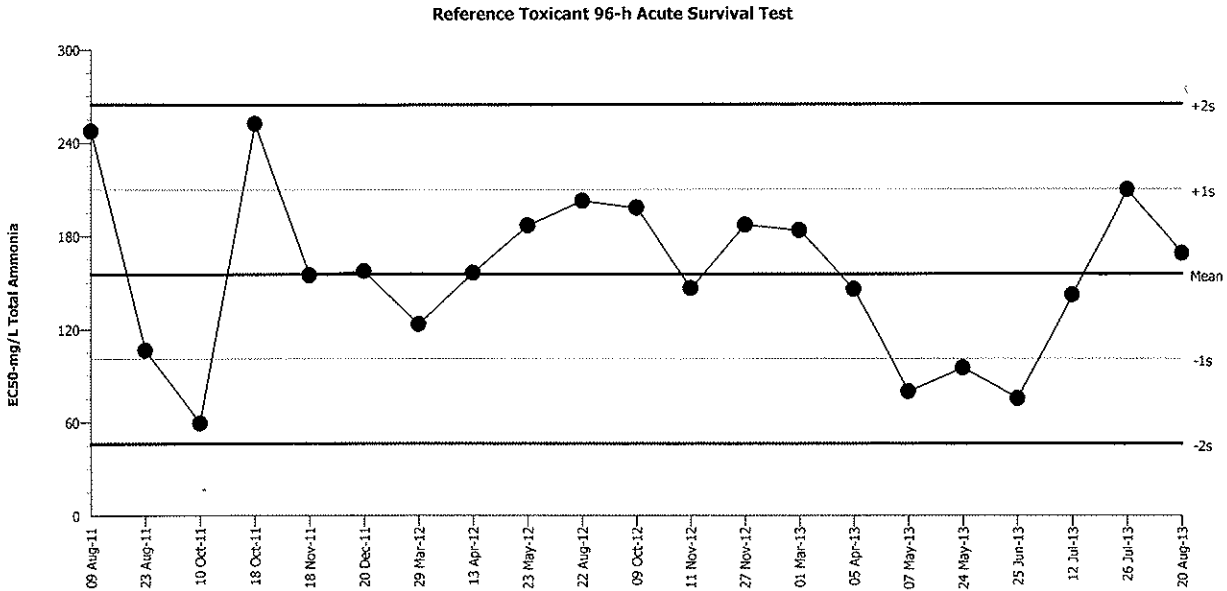
Species: <i>Neanthes arenaceodentata</i> *	Emergence Date: 7/20 - 8/2/13
Number Ordered: 700	Number Shipped: 700 + 10%
Date Shipped: 8/20/13	Salinity (ppt): 31

\*Smith 1964. CSU Long Beach strain. Feed upon arrival.

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Neanthes arenaceodentata (Polycha Material: Total Ammonia  
 Protocol: PSEP (1995) Endpoint: Proportion Survived Source: Reference Toxicant-REF



Mean: 155.5 Count: 20 -1s Warning Limit: 100.9 -2s Action Limit: 46.32  
 Sigma: 54.59 CV: 35.10% +1s Warning Limit: 210.1 +2s Action Limit: 264.7

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Aug	9	15:30	247.5	92.04	1.686	(+)		03-1197-4176	17-1966-7852
2			23	11:00	106.6	-48.94	-0.8965			19-2308-3344	15-0713-7604
3		Oct	10	15:35	59.38	-96.12	-1.761	(-)		06-7843-9085	12-6856-6267
4			18	14:35	252.7	97.16	1.78	(+)		20-2964-2236	02-6630-2269
5		Nov	18	14:45	154.8	-0.6581	-0.01206			07-1336-6281	16-3327-5847
6		Dec	20	14:25	157.3	1.831	0.03354			13-2009-7329	09-6676-8731
7	2012	Mar	29	14:15	123	-32.53	-0.596			09-7385-3936	17-7765-0407
8		Apr	13	14:00	156.2	0.7266	0.01331			19-8365-3565	12-2419-3140
9		May	23	13:50	186.8	31.3	0.5734			07-1703-6447	03-0067-3412
10		Aug	22	11:00	202.7	47.16	0.8639			02-2456-0921	14-8617-5684
11		Oct	9	14:00	198.3	42.76	0.7833			09-2476-6828	10-7898-4816
12		Nov	11	16:00	146.3	-9.187	-0.1683			05-7907-0031	15-4959-5175
13			27	16:05	187.1	31.6	0.5788			11-0295-5053	21-1714-9848
14	2013	Mar	1	14:40	183.7	28.21	0.5167			16-0938-7761	05-5518-0938
15		Apr	5	10:40	145.7	-9.836	-0.1802			12-4084-6308	11-0088-3368
16		May	7	13:00	79.7	-75.8	-1.389	(-)		03-6682-4675	04-2369-0564
17			24	11:30	94.89	-60.61	-1.11	(-)		19-1651-0673	18-8601-2491
18		Jun	25	14:13	75.13	-80.37	-1.472	(-)		08-9049-5052	01-8172-0753
19		Jul	12	13:20	141.9	-13.57	-0.2485			14-1288-0905	06-4191-8012
20			26	12:00	209.7	54.21	0.993			21-1882-7830	07-5315-7472
21		Aug	20	15:45	168.6	13.15	0.2408			00-0072-4465	03-0193-2385

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival

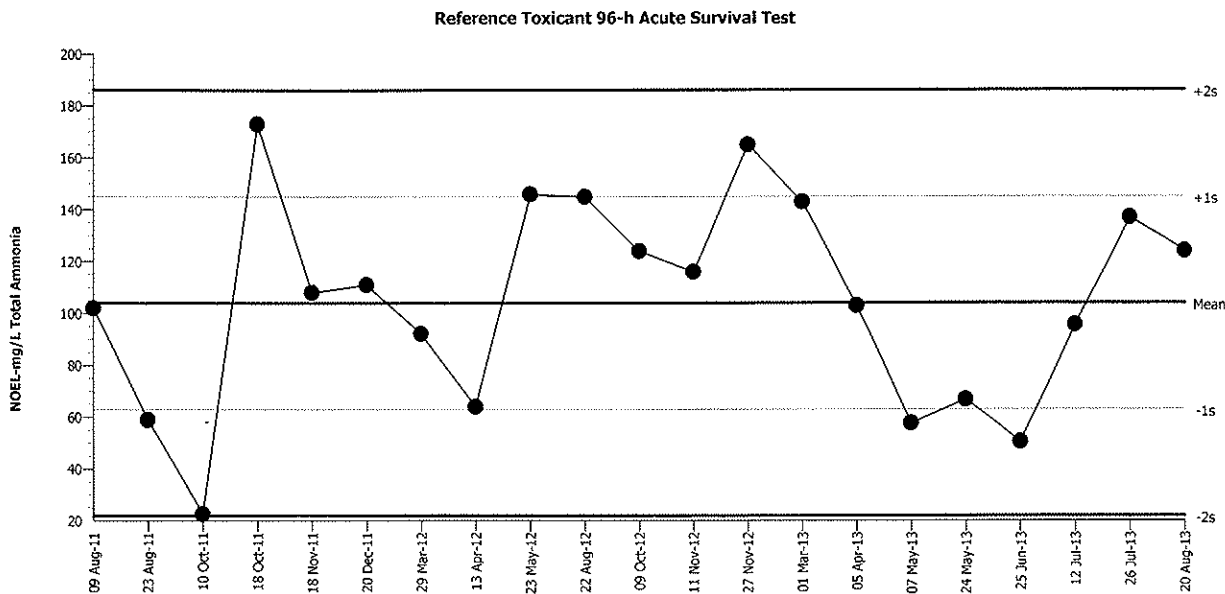
Organism: Neanthes arenaceodentata (Polycha

Material: Total Ammonia

Protocol: PSEP (1995)

Endpoint: Proportion Survived

Source: Reference Toxicant-REF



Mean: 104      Count: 20      -1s Warning Limit: 62.92      -2s Action Limit: 21.84  
 Sigma: 41.08      CV: 39.50%      +1s Warning Limit: 145.1      +2s Action Limit: 186.2

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Aug	9	15:30	102	-2	-0.04869			03-1197-4176	21-2173-4671
2			23	11:00	58.9	-45.1	-1.098	(-)		19-2308-3344	00-4985-4824
3		Oct	10	15:35	22.5	-81.5	-1.984	(-)		06-7843-9085	04-4902-3567
4			18	14:35	173	69	1.68	(+)		20-2964-2236	18-1232-0295
5		Nov	18	14:45	108	4	0.09737			07-1336-6281	00-5718-5578
6		Dec	20	14:25	111	7	0.1704			13-2009-7329	14-4698-1316
7	2012	Mar	29	14:15	92.2	-11.8	-0.2872			09-7385-3936	12-4682-6521
8		Apr	13	14:00	63.9	-40.1	-0.9761			19-8365-3565	05-2732-2674
9		May	23	13:50	146	42	1.022	(+)		07-1703-6447	01-7113-3932
10		Aug	22	11:00	145	41	0.9981			02-2456-0921	08-5116-1008
11		Oct	9	14:00	124	20	0.4869			09-2476-6828	01-8486-9232
12		Nov	11	16:00	116	12	0.2921			05-7907-0031	20-7001-2062
13			27	16:05	165	61	1.485	(+)		11-0295-5053	20-4892-3773
14	2013	Mar	1	14:40	143	39	0.9494			16-0938-7761	07-7870-4978
15		Apr	5	10:40	103	-1	-0.02434			12-4084-6308	12-0348-0416
16		May	7	13:00	57.6	-46.4	-1.13	(-)		03-6682-4675	13-3264-9963
17			24	11:30	66.7	-37.3	-0.908			19-1651-0673	19-7443-7088
18		Jun	25	14:13	50.4	-53.6	-1.305	(-)		08-9049-5052	06-0503-5931
19		Jul	12	13:20	95.6	-8.4	-0.2045			14-1288-0905	07-0996-7321
20			26	12:00	137	33	0.8033			21-1882-7830	14-5107-6466
21		Aug	20	15:45	124	20	0.4869			00-0072-4465	04-2226-9652

Reference Toxicant 96-h Acute Survival Test

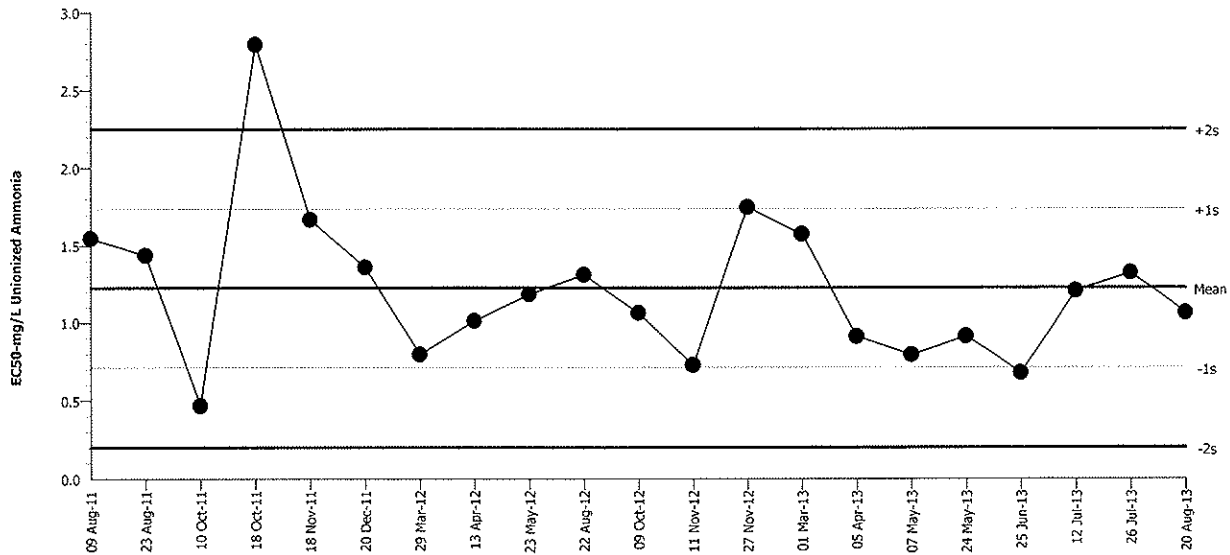
NewFields

Test Type: Survival  
Protocol: PSEP (1995)

Organism: Neanthes arenaceodentata (Polycha)  
Endpoint: Proportion Survived

Material: Unionized Ammonia  
Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test



Mean: 1.226      Count: 20      -1s Warning Limit: 0.713      -2s Action Limit: 0.2  
Sigma: 0.513      CV: 41.80%      +1s Warning Limit: 1.739      +2s Action Limit: 2.252

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Aug	9	15:30	1.547	0.3207	0.6251			03-9854-4015	07-2063-2491
2			23	11:00	1.436	0.2101	0.4096			09-3666-1661	07-6184-3703
3		Oct	10	15:35	0.4667	-0.7593	-1.48	(-)		04-4548-8932	08-5329-1975
4			18	14:35	2.797	1.571	3.062	(+)	(+)	05-4042-6561	09-4508-3623
5		Nov	18	14:45	1.667	0.4411	0.8599			07-2418-7894	04-3530-8185
6		Dec	20	14:25	1.359	0.133	0.2592			01-5692-9953	01-3178-0533
7	2012	Mar	29	14:15	0.7959	-0.4301	-0.8384			11-8184-4663	15-1974-6098
8		Apr	13	14:00	1.012	-0.2141	-0.4173			19-8413-7608	13-2594-7323
9		May	23	13:50	1.183	-0.04269	-0.08323			00-6722-3532	08-3889-1635
10		Aug	22	11:00	1.31	0.08421	0.1642			12-2636-9338	18-2386-8444
11		Oct	9	14:00	1.063	-0.1629	-0.3175			11-5377-0688	17-8993-7878
12		Nov	11	16:00	0.7276	-0.4984	-0.9715			14-7469-3886	03-0259-8994
13			27	16:05	1.746	0.5196	1.013	(+)		08-6061-4466	00-3182-3735
14	2013	Mar	1	14:40	1.573	0.3474	0.6772			18-8051-2966	06-9085-4102
15		Apr	5	10:40	0.9122	-0.3138	-0.6117			03-5469-7681	20-0412-7755
16		May	7	13:00	0.794	-0.432	-0.842			11-4883-5754	10-2519-8358
17			24	11:30	0.9143	-0.3117	-0.6076			03-1268-0321	17-3627-5339
18		Jun	25	14:30	0.6782	-0.5478	-1.068	(-)		07-6412-1006	01-8270-7142
19		Jul	12	13:20	1.207	-0.01881	-0.03667			06-2793-5359	03-5477-0692
20			26	12:00	1.324	0.09772	0.1905			08-3568-6719	13-1071-7473
21		Aug	20	15:45	1.065	-0.1606	-0.313			11-8125-8700	06-3963-9074

Reference Toxicant 96-h Acute Survival Test

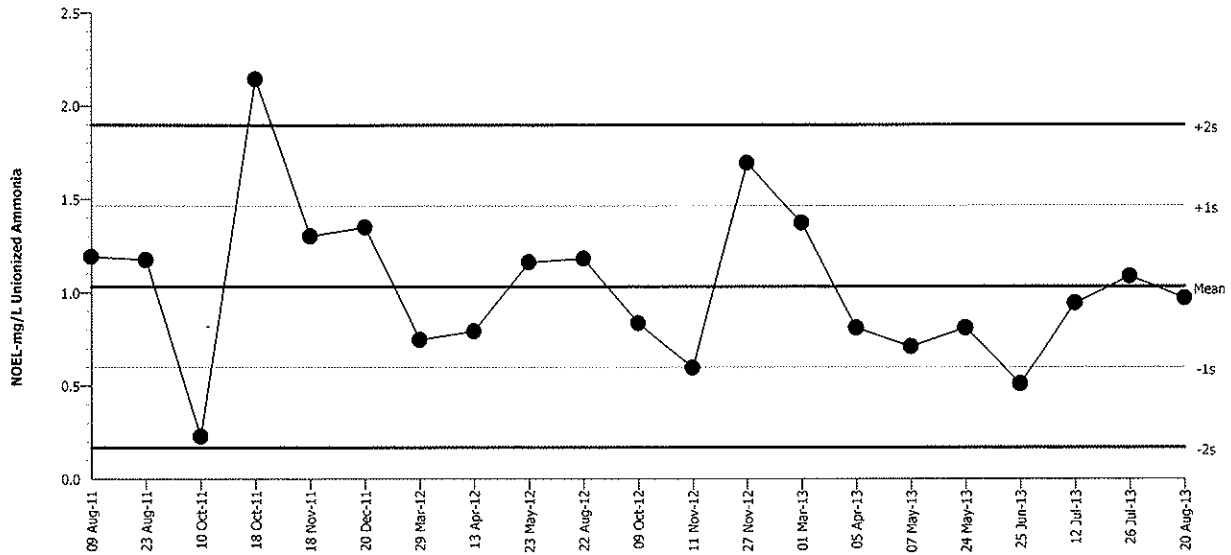
NewFields

Test Type: Survival  
Protocol: PSEP (1995)

Organism: Neanthes arenaceodentata (Polycha  
Endpoint: Proportion Survived

Material: Unionized Ammonia  
Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test



Mean: 1.032      Count: 20      -1s Warning Limit: 0.5995      -2s Action Limit: 0.167  
Sigma: 0.4325      CV: 41.90%      +1s Warning Limit: 1.464      +2s Action Limit: 1.897

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Aug	9	15:30	1.193	0.161	0.3723			03-9854-4015	01-1263-9916
2			23	11:00	1.176	0.144	0.3329			09-3666-1661	00-3462-6374
3		Oct	10	15:35	0.228	-0.804	-1.859	(-)		04-4548-8932	20-7967-8150
4			18	14:35	2.146	1.114	2.576	(+)	(+)	05-4042-6561	09-7290-5956
5		Nov	18	14:45	1.303	0.271	0.6266			07-2418-7894	02-8881-3753
6		Dec	20	14:25	1.35	0.318	0.7353			01-5692-9953	10-0045-4747
7	2012	Mar	29	14:15	0.747	-0.285	-0.659			11-8184-4663	00-5057-1480
8		Apr	13	14:00	0.793	-0.239	-0.5526			19-8413-7608	05-2899-5573
9		May	23	13:50	1.162	0.13	0.3006			00-6722-3532	11-8382-8902
10		Aug	22	11:00	1.183	0.151	0.3491			12-2636-9338	02-6993-9000
11		Oct	9	14:00	0.836	-0.196	-0.4532			11-5377-0688	14-5701-8660
12		Nov	11	16:00	0.596	-0.436	-1.008	(-)		14-7469-3886	17-5882-8497
13			27	16:05	1.693	0.661	1.528	(+)		08-6061-4466	05-8355-5463
14	2013	Mar	1	14:40	1.373	0.341	0.7884			18-8051-2966	09-6023-4535
15		Apr	5	10:40	0.811	-0.221	-0.511			03-5469-7681	20-7653-9268
16		May	7	13:00	0.71	-0.322	-0.7445			11-4883-5754	20-7240-7121
17			24	11:30	0.81	-0.222	-0.5133			03-1268-0321	20-4684-2719
18		Jun	25	14:30	0.51	-0.522	-1.207	(-)		07-6412-1006	18-2969-6397
19		Jul	12	13:20	0.943	-0.089	-0.2058			06-2793-5359	18-9450-4090
20			26	12:00	1.087	0.055	0.1272			08-3568-6719	20-5296-6252
21		Aug	20	15:45	0.97	-0.062	-0.1434			11-8125-8700	00-8450-2616



# CETIS Summary Report

Report Date: 05 Sep-13 12:28 (p 1 of 1)  
 Test Code: B0DF1 | 00-0072-4465

## Reference Toxicant 96-h Acute Survival Test

NewFields

<b>Batch ID:</b> 04-6814-1286	<b>Test Type:</b> Survival	<b>Analyst:</b>
<b>Start Date:</b> 20 Aug-13 15:45	<b>Protocol:</b> PSEP (1995)	<b>Diluent:</b> Laboratory Seawater
<b>Ending Date:</b> 24 Aug-13 16:00	<b>Species:</b> Neanthes arenaceodentata	<b>Brine:</b> Not Applicable
<b>Duration:</b> 4d 0h	<b>Source:</b> Aquatic Toxicology Support	<b>Age:</b>
<b>Sample ID:</b> 07-1348-6045	<b>Code:</b> 2A86EEDD	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 27 Sep-11	<b>Material:</b> Total Ammonia	<b>Project:</b> Reference Toxicant
<b>Receive Date:</b> 27 Sep-11	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> 693d 16h	<b>Station:</b> P110927.148	

### Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-2226-9652	Proportion Survived	124	240	172.5	6.09%		Bonferroni Adj t Test

### Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
03-0193-2385	Proportion Survived	EC50	168.6	161.2	176.4		Spearman-Kärber

### Proportion Survived Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	1	1	1	1	1	0	0	0.0%	0.0%
16.5		3	1	1	1	1	1	0	0	0.0%	0.0%
31.7		3	1	1	1	1	1	0	0	0.0%	0.0%
61.9		3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	3.33%
124		3	1	1	1	1	1	0	0	0.0%	0.0%
240		3	0	0	0	0	0	0	0		100.0%

### Proportion Survived Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	1	1	1
16.5		1	1	1
31.7		1	1	1
61.9		1	0.9	1
124		1	1	1
240		0	0	0

### Proportion Survived Binomials

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	10/10	10/10	10/10
16.5		10/10	10/10	10/10
31.7		10/10	10/10	10/10
61.9		10/10	9/10	10/10
124		10/10	10/10	10/10
240		0/10	0/10	0/10

# CETIS Summary Report

Report Date: 05 Sep-13 14:24 (p 1 of 1)  
 Test Code: 466893CC | 11-8125-8700

## Reference Toxicant 96-h Acute Survival Test

NewFields

Batch ID: 12-4061-3753-	Test Type: Survival	Analyst:
Start Date: 20 Aug-13 15:45	Protocol: PSEP (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Aug-13 16:00	Species: Neanthes arenaceodentata	Brine: Not Applicable
Duration: 4d 0h	Source: Aquatic Toxicology Support	Age:

Sample ID: 20-9230-3204	Code: 7CB60364	Client: Internal Lab
Sample Date: 27 Sep-11	Material: Unionized Ammonia	Project: Reference Toxicant
Receive Date: 27 Sep-11	Source: Reference Toxicant	
Sample Age: 693d 16h	Station: P110927.148	

### Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-8450-2616	Proportion Survived	0.97	1.197	1.078	6.09%		Bonferroni Adj t Test

### Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
06-3963-9074	Proportion Survived	EC50	1.065	1.04	1.091		Spearman-Kärber

### Proportion Survived Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	1	1	1	1	1	0	0	0.0%	0.0%
0.32		3	1	1	1	1	1	0	0	0.0%	0.0%
0.391		3	1	1	1	1	1	0	0	0.0%	0.0%
0.764		3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	3.33%
0.97		3	1	1	1	1	1	0	0	0.0%	0.0%
1.197		3	0	0	0	0	0	0	0		100.0%

### Proportion Survived Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	1	1	1
0.32		1	1	1
0.391		1	1	1
0.764		1	0.9	1
0.97		1	1	1
1.197		0	0	0

### Proportion Survived Binomials

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	10/10	10/10	10/10
0.32		10/10	10/10	10/10
0.391		10/10	10/10	10/10
0.764		10/10	9/10	10/10
0.97		10/10	10/10	10/10
1.197		0/10	0/10	0/10

**CETIS Test Data Worksheet**

Report Date: 05 Sep-13 12:28 (p 1 of 1)  
 Test Code: 00-0072-4465/B0DF1

<b>Reference Toxicant 96-h Acute Survival Test</b>						<b>NewFields</b>
<b>Start Date:</b>	20 Aug-13 15:45	<b>Species:</b>	Neanthes arenaceodentata	<b>Sample Code:</b>	2A86EEDD	
<b>End Date:</b>	24 Aug-13 16:00	<b>Protocol:</b>	PSEP (1995)	<b>Sample Source:</b>	Reference Toxicant	
<b>Sample Date:</b>	27 Sep-11	<b>Material:</b>	Total Ammonia	<b>Sample Station:</b>	P110927.148	

C-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	6	10	10	
0	D	2	9	10	10	
0	D	3	2	10	10	
16.5		1	7	10	10	
16.5		2	5	10	10	
16.5		3	1	10	10	
31.7		1	16	10	10	
31.7		2	17	10	10	
31.7		3	13	10	10	
61.9		1	18	10	10	
61.9		2	14	10	9	
61.9		3	15	10	10	
124		1	3	10	10	
124		2	10	10	10	
124		3	4	10	10	
240		1	12	10	0	
240		2	11	10	0	
240		3	8	10	0	

**CETIS Test Data Worksheet**

Report Date: 05 Sep-13 14:23 (p 1 of 1)  
 Test Code: 11-8125-8700/466893CC

Reference Toxicant 96-h Acute Survival Test						NewFields
Start Date:	20 Aug-13 15:45	Species:	Neanthes arenaceodentata	Sample Code:	7CB60364	
End Date:	24 Aug-13 16:00	Protocol:	PSEP (1995)	Sample Source:	Reference Toxicant	
Sample Date:	27 Sep-11	Material:	Unionized Ammonia	Sample Station:	P110927.148	

C-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	3	10	10	
0	D	2	16	10	10	
0	D	3	14	10	10	
0.32		1	7	10	10	
0.32		2	17	10	10	
0.32		3	8	10	10	
0.391		1	4	10	10	
0.391		2	12	10	10	
0.391		3	18	10	10	
0.764		1	10	10	10	
0.764		2	2	10	9	
0.764		3	5	10	10	
0.97		1	11	10	10	
0.97		2	6	10	10	
0.97		3	9	10	10	
1.197		1	1	10	0	
1.197		2	13	10	0	
1.197		3	15	10	0	



CLIENT Internal	PROJECT Various	SPECIES <i>Neanthes arenaceodentata</i>	NEWFIELDS LABORATORY Port Gamble	PROTOCOL USEPA/USCOE 1991
TEST ID P110927.148	LOT #: 111079	TEST START DATE 20Aug13	TIME 1545	4-DAY END DATE 24Aug13 TIME 1600
				10-DAY END DATE 30Aug13 TIME 1750

### WATER QUALITY DATA

TEST CONDITIONS				DO (mg/L)	TEMP(C)	SAL (ppt)	pH		TECHNICIAN	AMMONIA		SULFIDES				
CLIENT/NEWFIELDS ID	CONCENTRATION		DAY	REP	> 5.0		20 ± 1		30 ± 2		7.8 ± 0.5					
	value	units			D.O.	TEMP.	SALINITY		pH		WQ TECH/ DATE		AMMONIA		SULFIDES	
					meter	mg/L	meter	°C	meter	ppt	meter	unit				
Ref.Tox.-ammonia	0	mg/L	0	Stock	6	7.6	6	19.3	2	31	5	7.9	JL 8/20	3	0.00	
			4	1	6	7.0	6	20.0	2	31	5	8.1	JL 8/24			
			6	2	6	7.1	6	19.8	2	31	5	7.9	JL 8/26			
			8	3	6	7.2	6	19.8	2	32	5	8.0	MMBS/28			
			10	1	6	7.0	6	20.0	2	32	5	8.0	JL 8/30			
Ref.Tox.-ammonia	15	mg/L	0	Stock	6	7.7	6	19.4	2	31	5	7.8	JL 8/20	3	16.5	
			4	1	6	7.1	6	20.1	2	31	5	8.1	JL 8/24			
			6	2	6	7.2	6	19.9	2	32	5	7.9	JL 8/26			
			8	3	6	7.1	6	19.9	2	32	5	8.0	MMBS/28			
			10	1	6	7.0	6	20.0	2	31	5	8.0	JL 8/30			
Ref.Tox.-ammonia	30	mg/L	0	Stock	6	7.7	6	19.4	2	31	5	7.6	JL 8/20	3	31.7	
			4	1	6	7.0	6	20.2	2	31	5	8.0	JL 8/24			
			6	2	6	7.0	6	19.9	2	31	5	7.9	JL 8/26			
			8	3	6	7.1	6	19.9	2	31	5	7.9	MMBS/28			
			10	1	6	6.8	6	20.0	2	31	5	8.0	JL 8/30			
Ref.Tox.-ammonia	60	mg/L	0	Stock	6	7.7	6	19.4	2	31	5	7.6	JL 8/20	3	61.9	
			4	1	6	7.6	6	20.2	2	31	5	8.0	JL 8/24			
			6	2	6	6.8	6	20.0	2	31	5	7.9	JL 8/26			
			8	3	6	6.8	6	20.0	2	31	5	7.9	MMBS/28			
			10	1	6	6.6	6	20.0	2	31	5	7.8	JL 8/30			
Ref.Tox.-ammonia	120	mg/L	0	Stock	6	7.7	6	19.4	2	31	5	7.4	JL 8/20	3	124	
			4	1	6	6.4	6	20.2	2	31	5	7.9	JL 8/24			
			6	2	6	5.6	6	20.0	2	31	5	7.7	JL 8/26			
			8	3	_____											
			10	1	_____											
Ref.Tox.-ammonia	240	mg/L	0	Stock	6	7.7	6	19.5	2	31	5	7.2	JL 8/20	3	240	
			4	1	6	5.4	6	20.2	2	31	5	7.7	JL 8/24			
			6	2	_____											
			8	3	_____											
			10	1	_____											

# Ammonia Reference Toxicant Test Survival Data Sheet



CLIENT Internal	NEWFIELDS JOB NO. 0	SPECIES <i>Neanthes arenaceodentata</i>	PROJECT MANAGER B. Hester
		PROTOCOL USEPAUSCOE 1991	LABORATORY Port Gamble

## SURVIVAL & BEHAVIOR DATA

CLIENT/NEWFIELDS ID	CONC. mg/L	REP	SURVIVAL & BEHAVIOR DATA																			
			DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10										
INITIAL # OF ORGANISMS			DATE	TECHNICIAN	DATE	TECHNICIAN	DATE	TECHNICIAN	DATE	TECHNICIAN	DATE	TECHNICIAN	DATE	TECHNICIAN	DATE	TECHNICIAN						
10	0 mg/L	1	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	0 mg/L	2	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	0 mg/L	3	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	15 mg/L	1	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	15 mg/L	2	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	15 mg/L	3	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	30 mg/L	1	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	30 mg/L	2	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	30 mg/L	3	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	60 mg/L	1	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	60 mg/L	2	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	60 mg/L	3	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	120 mg/L	1	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	120 mg/L	2	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	120 mg/L	3	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	240 mg/L	1	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	240 mg/L	2	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh
10	240 mg/L	3	8/21	sh	8/22	sh	8/23	sh	8/24	sh	8/25	sh	8/26	sh	8/27	sh	8/28	sh	8/29	sh	8/30	sh

FEED: JU

## Amp and Neanthes NH<sub>3</sub> RT

Assumptions in Model

Stock ammonia concentration is 10,000 mg/L = 10 mg/mL

Actual Reading

9323

Test Solutions			Volume of stock to reach desired concentration
Measured Concentration	Desired Concentration	Volume	
mg/L	mg/L	mL	mL stock to increase
			SALT WATER
	240	1500	57.921
	120	1500	28.961
	60	1500	14.480
	30	1500	7.240
	15	1500	3.620



**Balboa Marina West**

**Menidia SPP Test Benchsheets**



CLIENT	PROJECT	NEWFIELDS JOB NO.	PROJECT MANAGER	SPECIES
City of Newport Beach	Balboa Marina West	860.0100.000	B. Hester	Menidia beryllina
				NEWFIELDS LABORATORY
				Port Gamble / Bath 7
				PROTOCOL
				USEPA/USCOE 1998

**SURVIVAL & BEHAVIOR DATA**

CLIENT/NEWFIELDS ID	CONC. value	units	REP	INITIAL NUMBER	8/12/13		8.18.13		8/19/13		8/20/13		
					#ALIVE	#DEAD	#ALIVE	#DEAD	#ALIVE	#DEAD	#ALIVE	#DEAD	
Area A-Comp / 10 %			1	10	0	0	10	0	10	0	9	1	
			2	10	0	10	0	10	0	10	0	10	0
			3	10	0	10	0	10	0	10	0	10	0
			4	10	0	9	1	9	0	9	0	9	0
			5	10	0	10	0	10	0	10	0	10	0
Area A-Comp / 50 %			1	10	0	0	9	1	9	0	9	0	
			2	10	0	10	0	10	0	10	0	10	0
			3	10	0	10	0	10	0	10	0	10	0
			4	10	0	10	0	10	0	10	0	10	0
			5	10	0	10	0	10	0	10	0	10	0
Area A-Comp / 100 %			1	10	0	0	10	0	10	0	10	0	
			2	10	0	10	0	10	0	10	0	10	0
			3	10	0	10	0	10	0	10	0	10	0
			4	10	0	9	1	9	0	9	0	9	0
			5	10	0	10	0	10	0	10	0	10	0

**OBSERVATION KEY**  
 N = normal  
 LOE = loss of equilibrium  
 Q = quiescent  
 DC = discoloration  
 NB = no body  
 F = Floating on Surface

INITIAL # OF ORGANISMS  
 10

CLIENT	PROJECT	NEWFIELDS JOB NO.	PROJECT MANAGER	SPECIES
City of Newport Beach	Balboa Marina West	860.0100.000	B. Hester	Menidia beryllina
				NEWFIELDS LABORATORY
				Port Gamble / Bath 7
				PROTOCOL
				USEPA/USCOE 1998

**SURVIVAL & BEHAVIOR DATA**

CLIENT/NEWFIELDS ID	CONC. value	REP	INITIAL NUMBER	DATE 8/17/13		DATE 8.18.13		DATE 8/19/13		DATE 8/20/13	
				#ALIVE	#DEAD	#ALIVE	#DEAD	#ALIVE	#DEAD	#ALIVE	#DEAD
Area B-Comp / 10 %	10	1	10	0	0	9	1	9	0	9	0
		2	10	0	0	9	1	8	1	8	0
		3	10	0	0	9	1	8	1	8	0
		4	10	0	0	9	1	9	0	9	0
		5	10	0	0	10	0	10	0	8	0
Area B-Comp / 50 %	10	1	10	0	0	9	1	9	0	9	0
		2	10	0	0	10	0	10	0	10	0
		3	10	0	0	10	0	8	2	8	0
		4	9	1	0	9	0	8	1	8	0
		5	10	0	0	10	0	10	0	10	0
Area B-Comp / 100 %	10	1	10	0	0	10	0	10	0	10	0
		2	10	0	0	10	0	10	0	9	1
		3	10	0	0	10	0	10	0	9	1
		4	10	0	0	10	0	10	0	9	1
		5	10	0	0	10	0	10	0	10	0

**OBSERVATION KEY**  
 N = normal  
 LOE = loss of equilibrium  
 Q = quiescent  
 DC = discoloration  
 NB = no body  
 F = Floating on Surface

INITIAL # OF ORGANISMS  
 10

CLIENT City of Newport Beach	PROJECT Balboa Marina West	SPECIES <i>Menidia beryllina</i>	DILUTION WATER BATCH FSW081513.01	TEST START DATE 26 Jul 13	TIME 1700
NEWFIELDS JOB NUMBER 860.0100.000	PROJECT MANAGER B. Hester	NEWFIELDS LABORATORY Port Gamble Bath 7	PROTOCOL USEPA/USCOE 1998 / NEWFIELDS TOX067	TEST END DATE 30 Jul 13	TIME 1545

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	CONCENTRATION		DAY	REP	DO (mg/L)		TEMP (°C)		SALINITY (ppt)		pH		Date	Tech	FEEDING
	value	units			meter	D.O.	meter	TEMP.	meter	ppt	meter	unit			
Control /	0 %		0	Stock	6	>4.7	6	19.4	2	25	5	7.6	8/6/13	BH	
Control /	0 %		1	1	6	7.1	6	20.3	2	25	5	7.6	8/11/13	JL	
Control /	0 %		2	2	6	7.1	6	19.9	2	25	5	7.3	8.1.8	BK	BA
Control /	0 %		3	3	6	6.6	6	19.7	2	25	5	7.3	8/9	SG	
Control /	0 %		4	4	6	6.9	6	19.5	2	26	5	7.6	8/20	JL	

CLIENT City of Newport Beach	PROJECT Balboa Marina West	SPECIES Menidia beryllina	DILUTION WATER BATCH FSW081513.01	TEST START DATE 26 Jul 13	TIME 1700
NEWFIELDS JOB NUMBER 860.0100.000	PROJECT MANAGER B. Hester	NEWFIELDS LABORATORY Port Gamble Bath 7	PROTOCOL USEPA/USCOE 1998 / NEWFIELDS TOX067	TEST END DATE 30 Jul 13	TIME 1545

WATER QUALITY DATA

CLIENT / NEWFIELDS ID	CONCENTRATION		DAY	REP	DO (mg/L)		TEMP. (C)		SALINITY (ppt)		pH		Date	Tech	FEEDING
	value	units			meter	mg/L	meter	°C	meter	ppt	meter	unit			
Area A-Comp /	10 %		0	Stock	6	7.7	6	19.3	2	25	5	8.1	8/16/13	BH	
Area A-Comp /	10 %		1	1	6	7.1	6	20.5	2	25	5	7.9	8/17	JL	
Area A-Comp /	10 %		2	2	6	7.0	6	19.9	2	25	5	7.6	8.18	BH	BH
Area A-Comp /	10 %		3	3	6	6.4	6	20.0	2	25	5	7.7	8/19	BG	
Area A-Comp /	10 %		4	4	6	6.9	6	19.8	2	25	5	7.8	8/20	JL	
Area A-Comp /	50 %		0	Stock	6	7.7	6	19.1	2	25	5	8.2	8/16/13	BH	
Area A-Comp /	50 %		1	1	6	7.0	6	20.4	2	25	5	8.1	8/17	JL	
Area A-Comp /	50 %		2	2	6	7.0	6	20.2	2	26	5	7.7	8.18	BH	BH
Area A-Comp /	50 %		3	3	6	6.0	6	20.2	2	26	5	7.9	8/19	BG	
Area A-Comp /	50 %		4	4	6	6.9	6	19.6	2	26	5	7.9	8/20	JL	
Area A-Comp /	100 %		0	Stock	6	7.7	6	19.0	2	26	5	8.3	8/16/13	BH	
Area A-Comp /	100 %		1	1	6	7.1	6	20.3	2	26	5	8.1	8/17	JL	
Area A-Comp /	100 %		2	2	6	6.9	6	20.3	2	26	5	7.8	8.18	BH	BH
Area A-Comp /	100 %		3	3	6	6.6	6	20.2	2	26	5	8.0	8/19	BG	
Area A-Comp /	100 %		4	4	6	6.8	6	19.5	2	26	5	8.0	8/20	JL	

① IE 8/16/13 BH

② WC JL 8/20/13.

CLIENT City of Newport Beach NEWFIELDS JOB NUMBER 860.0100.000	PROJECT Balboa Marina West PROJECT MANAGER B. Hester	SPECIES Menidia beryllina NEWFIELDS LABORATORY Port Gamble Bath 7	DILUTION WATER BATCH FSW081513.01 PROTOCOL USEPA/USCOE 1998 / NEWFIELDS TOX067	TEST START DATE 26 Jul 13	TIME 1700
				TEST END DATE 30 Jul 13	TIME 1545

WATER QUALITY DATA

CLIENT/ NEWFIELDS ID	CONCENTRATION		DAY	REP	DO (mg/L)		TEMP (°C)		SALINITY (ppt)		pH		Date	Tech	FEEDING
	value	units			meter	D.O.	meter	TEMP.	meter	ppt	meter	unit			
Area B-Comp /	10 %		0	Stock	6	7.6	6	19.4	2	25	5	8.1	8/16/13	BA	
Area B-Comp /	10 %		1	1	6	7.1	6	20.4	2	25	5	8.0	8/17	JL	
Area B-Comp /	10 %		2	2	6	7.0	6	20.5	2	25	5	7.7	8/18	BA	BA
Area B-Comp /	10 %		3	3	6	6.6	6	20.2	2	25	5	7.9	8/19	DG	
Area B-Comp /	10 %		4	4	6	6.9	6	19.7	2	25	5	7.8	8/20	JL	
Area B-Comp /	50 %		0	Stock	6	7.6	6	19.4	2	25	5	8.1	8/16/13	BA	
Area B-Comp /	50 %		1	1	6	7.0	6	20.4	2	25	5	8.0	8/17	JL	
Area B-Comp /	50 %		2	2	6	6.9	6	20.5	2	25	5	7.7	8/18	BA	BA
Area B-Comp /	50 %		3	3	6	6.8	6	19.9	2	25	5	7.8	8/19	DG	
Area B-Comp /	50 %		4	4	6	7.0	6	19.6	2	26	5	7.9	8/20	JL	
Area B-Comp /	100 %		0	Stock	6	7.7	6	19.2	2	25	5	8.1	8/16/13	BA	
Area B-Comp /	100 %		1	1	6	7.1	6	20.3	2	25	5	8.0	8/17	JL	
Area B-Comp /	100 %		2	2	6	7.0	6	20.6	2	25	5	7.6	8/18	BA	BA
Area B-Comp /	100 %		3	3	6	6.8	6	19.9	2	25	5	7.8	8/19	DG	
Area B-Comp /	100 %		4	4	6	7.0	6	19.7	2	25	5	7.8	8/20	JL	







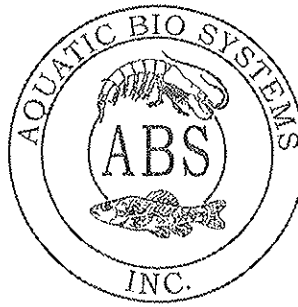


# NewFields

## ORGANISM RECEIPT LOG

Date: 8/15/13		Time: 1250		NewFields Batch No. ABS 5756 Mb		
Organism / Project: Menidia Beryllina / Fort Pierce, Balboa				Invoice Attached <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Source / Supplier: Aquatic Bio Systems				Contact: on file		
No. Ordered: 1500		No. Received: 1650		Source Batch: (Collection date, hatch date, etc.): Hatched 8/06/13		
Condition of Organisms: (Good, fair, poor; describe.): Fair				Approximate Size or Age: (Days from hatch, life stage, size class, etc.): 9 days		
Shipper: FedEx				B of L (Tracking No.) 5118 7588 5756		
Condition of Container: (Good, fair, poor; describe.): Good				Received By: JL		
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	Number Dead or Moribund	Technician (Initials)
1	10.3	22.4	21 ppt	7.2	20	JL
2	10.3	22.4	21	7.3	13	↓
3	10.3	22.5	21	7.2	19	
4	9.9	22.4	24	7.1	~150	
Notes:						

1300 Blue Spruce Drive, Suite C  
Fort Collins, Colorado 80524



Toll Free: 800/331-5916  
Tel: 970/484-5091 Fax: 970/484-2514

### ORGANISM HISTORY

DATE: 8/14/2013

SPECIES: Menidia beryllina

AGE: 8 day

LIFE STAGE: Juvenile

HATCH DATE: 8/6/2013

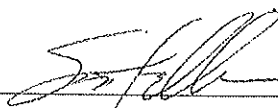
BEGAN FEEDING: Immediately

FOOD: Rotifers, Artemia sp.

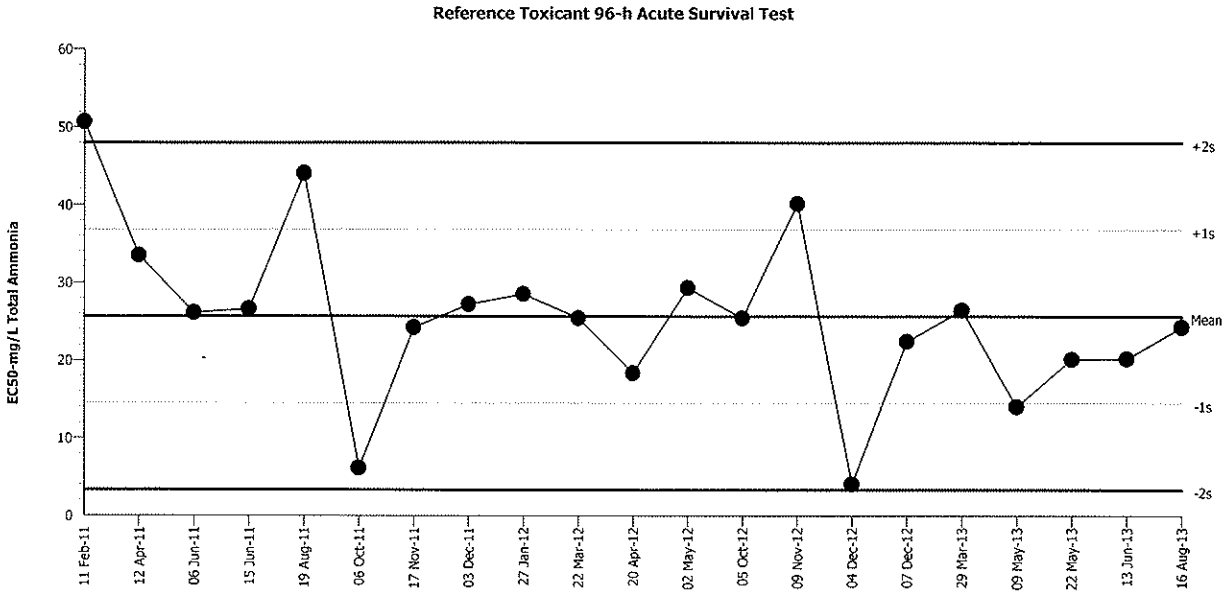
### Water Chemistry Record:

	Current	Range
TEMPERATURE:	<u>25°C</u>	<u>23-26 °C</u>
SALINITY/CONDUCTIVITY:	<u>25 ppt</u>	<u>24-26 ppt</u>
TOTAL HARDNESS (as CaCO <sub>3</sub> ):	<u>--</u>	<u>--</u>
TOTAL ALKALINITY (as CaCO <sub>3</sub> ):	<u>180 mg/l</u>	<u>150-210 mg/l</u>
pH:	<u>8.26</u>	<u>7.60-8.27</u>

### Comments:

  
\_\_\_\_\_  
Facility Supervisor

Reference Toxicant 96-h Acute Survival Test			NewFields
Test Type: Survival	Organism: Menidia beryllina (Inland Silverside)	Material: Total Ammonia	
Protocol: EPA/821/R-02-012 (2002)	Endpoint: Proportion Survived	Source: Reference Toxicant-REF	



**Mean:** 25.64      **Count:** 20      **-1s Warning Limit:** 14.48      **-2s Action Limit:** 3.32  
**Sigma:** 11.16      **CV:** 43.50%      **+1s Warning Limit:** 36.8      **+2s Action Limit:** 47.96

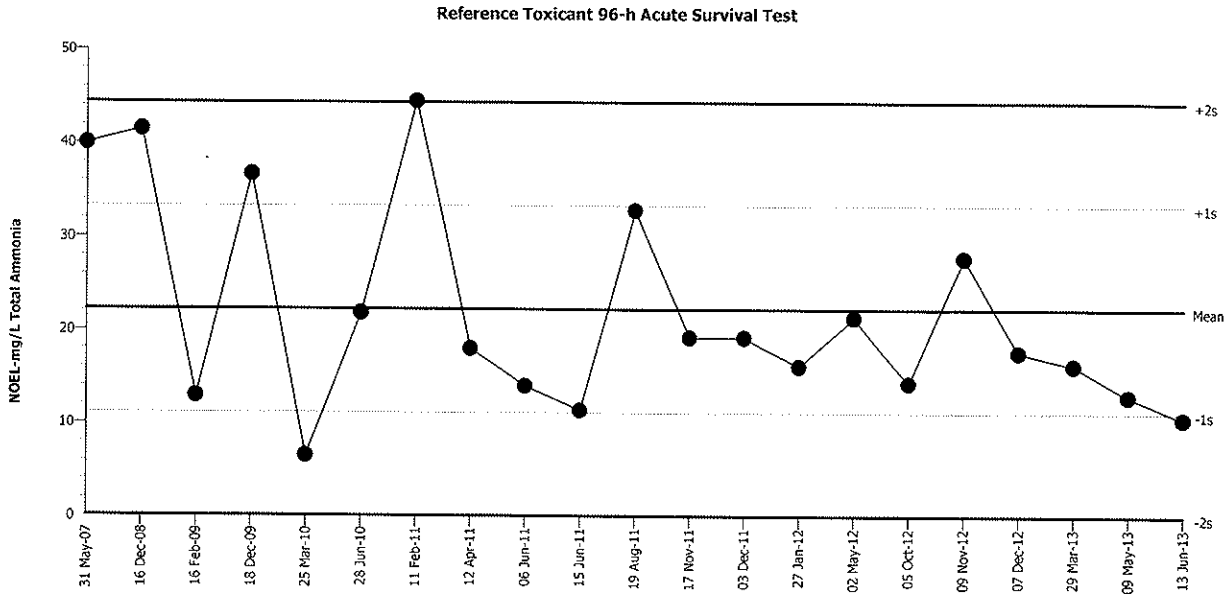
Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Feb	11	17:40	50.66	25.02	2.242	(+)	(+)	00-0413-5303	03-1677-3493
2		Apr	12	15:30	33.5	7.86	0.7043			13-1051-4181	13-5930-4271
3		Jun	6	17:35	26.11	0.4687	0.042			00-9058-1631	04-5372-0752
4			15	17:10	26.6	0.96	0.08602			17-8002-1401	16-7843-9978
5		Aug	19	13:00	44.04	18.4	1.649	(+)		11-8516-4449	08-1900-6363
6		Oct	6	16:10	6.145	-19.49	-1.747	(-)		03-8716-9751	11-2124-4034
7		Nov	17	15:00	24.2	-1.444	-0.1294			02-5818-9266	08-1344-1564
8		Dec	3	13:00	27.18	1.539	0.1379			07-1663-2602	10-4950-3971
9	2012	Jan	27	15:35	28.51	2.867	0.2569			06-7921-9387	13-8930-2739
10		Mar	22	16:30	25.43	-0.214	-0.01917			13-8750-4145	17-3860-7020
11		Apr	20	16:30	18.37	-7.266	-0.6511			07-0896-3675	14-0864-3722
12		May	2	14:45	29.33	3.687	0.3304			15-3413-2419	18-5527-0837
13		Oct	5	17:30	25.42	-0.216	-0.01936			11-8705-5892	18-1236-3180
14		Nov	9	16:50	40.12	14.48	1.297	(+)		10-9947-7092	06-9379-9250
15		Dec	4	16:40	4.077	-21.56	-1.932	(-)		04-2938-2554	02-3843-4687
16			7	18:00	22.43	-3.212	-0.2878			07-1944-1107	08-0578-9892
17	2013	Mar	29	17:30	26.41	0.7732	0.06928			15-6629-7016	01-6143-5562
18		May	9	17:15	14.03	-11.61	-1.041	(-)		05-2515-0422	09-7554-7266
19			22	13:00	20.13	-5.514	-0.494			02-1650-1674	15-0431-6258
20		Jun	13	14:35	20.21	-5.433	-0.4868			20-5493-9860	05-5535-3084
21		Aug	16	17:05	24.28	-1.361	-0.1219			03-1026-2061	15-7497-8436

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Menidia beryllina (Inland Silverside) Material: Total Ammonia  
 Protocol: EPA/821/R-02-012 (2002) Endpoint: Proportion Survived Source: Reference Toxicant-REF



Mean: 22.23 Count: 20 -1s Warning Limit: 11.14 -2s Action Limit: 0.05  
 Sigma: 11.09 CV: 49.90% +1s Warning Limit: 33.32 +2s Action Limit: 44.41

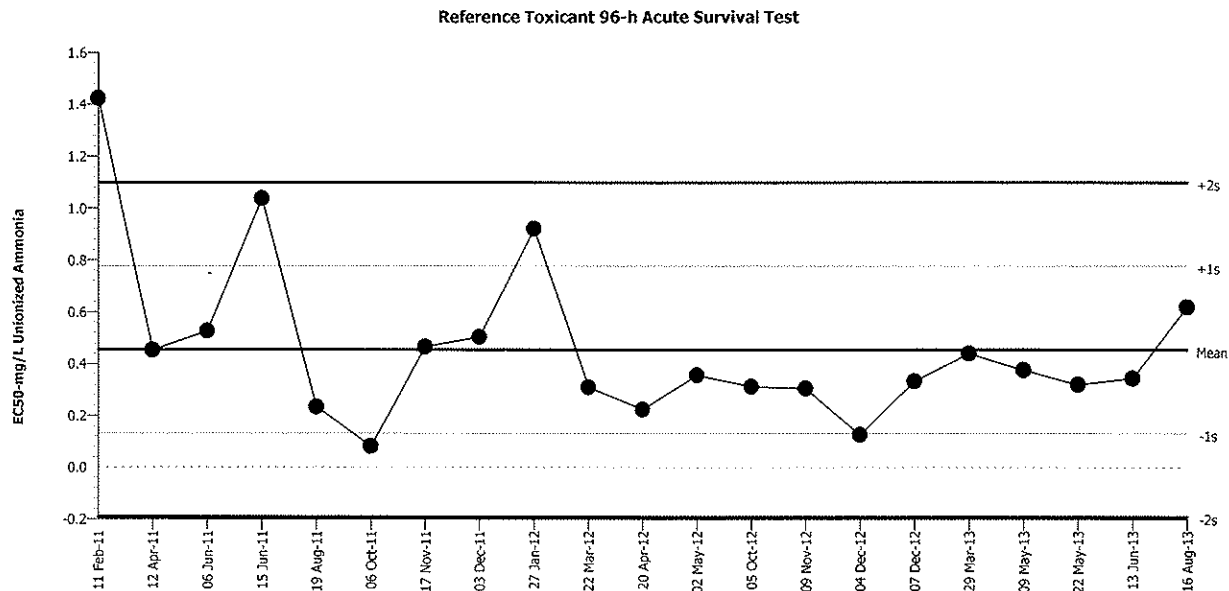
Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2007	May	31	18:30	40	17.77	1.602	(+)		04-5535-7640	14-2707-3902
2	2008	Dec	16	18:30	41.5	19.27	1.738	(+)		03-9705-7587	04-1924-2676
3	2009	Feb	16	17:45	12.9	-9.33	-0.8413			16-3367-1830	00-0907-5019
4		Dec	18	15:15	36.7	14.47	1.305	(+)		19-3667-5455	15-5429-0522
5	2010	Mar	25	15:50	6.51	-15.72	-1.417	(-)		04-9257-6521	07-5946-8245
6		Jun	28	18:25	21.8	-0.43	-0.03877			08-5572-3504	16-4913-8732
7	2011	Feb	11	17:40	44.5	22.27	2.008	(+)	(+)	00-0413-5303	11-7242-2866
8		Apr	12	15:30	18	-4.23	-0.3814			13-1051-4181	20-0471-6553
9		Jun	6	17:35	14	-8.23	-0.7421			00-9058-1631	17-5245-0199
10			15	17:10	11.4	-10.83	-0.9766			17-8002-1401	05-7976-0808
11		Aug	19	13:00	32.8	10.57	0.9531			11-8516-4449	05-7847-6679
12		Nov	17	15:00	19.2	-3.03	-0.2732			02-5818-9266	11-0569-2532
13		Dec	3	13:00	19.2	-3.03	-0.2732			07-1663-2602	04-1116-2487
14	2012	Jan	27	15:35	16.1	-6.13	-0.5528			06-7921-9387	00-8363-6930
15		May	2	14:45	21.3	-0.93	-0.08386			15-3413-2419	20-0749-4984
16		Oct	5	17:30	14.3	-7.93	-0.7151			11-8705-5892	02-1881-7753
17		Nov	9	16:50	27.7	5.47	0.4932			10-9947-7092	19-0937-6517
18		Dec	7	18:00	17.6	-4.63	-0.4175			07-1944-1107	09-2382-2727
19	2013	Mar	29	17:30	16.2	-6.03	-0.5437			15-6629-7016	08-5086-4918
20		May	9	17:15	12.9	-9.33	-0.8413			05-2515-0422	04-5846-5135
21		Jun	13	14:35	10.5	-11.73	-1.058	(-)		20-5493-9860	10-1570-8714

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Menidia beryllina (Inland Silverside) Material: Unionized Ammonia  
 Protocol: EPA/821/R-02-012 (2002) Endpoint: Proportion Survived Source: Reference Toxicant-REF



Mean: 0.4544 Count: 20 -1s Warning Limit: 0.1316 -2s Action Limit: -0.1912  
 Sigma: 0.3228 CV: 71.00% +1s Warning Limit: 0.7772 +2s Action Limit: 1.1

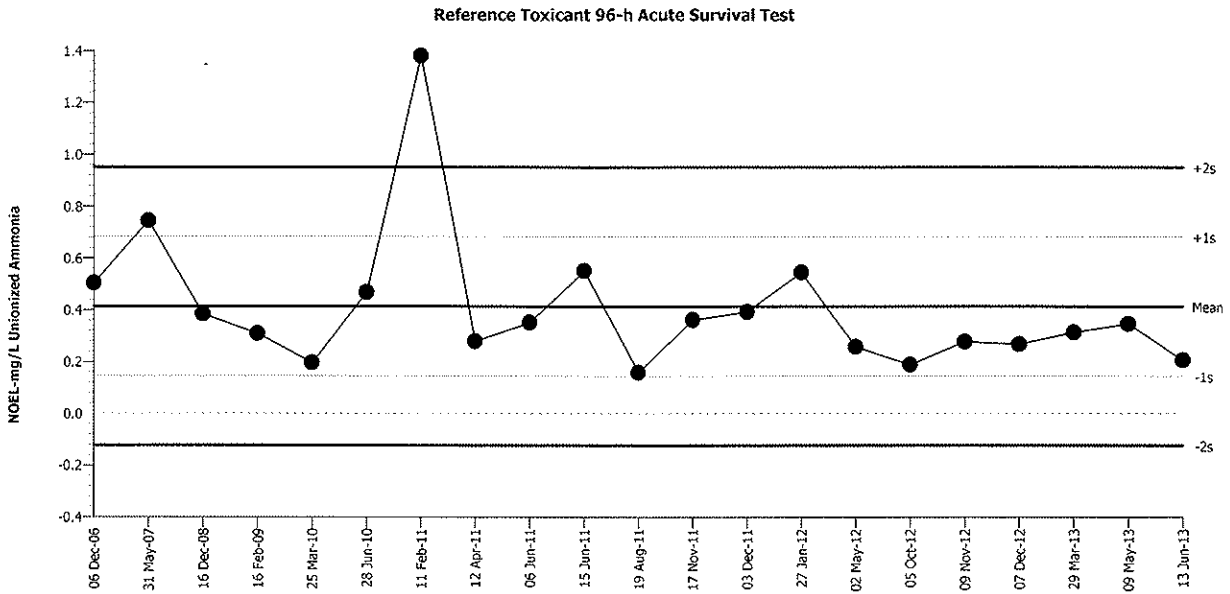
Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Feb	11	17:40	1.424	0.9692	3.002	(+)	(+)	04-2948-6740	14-5838-5883
2		Apr	12	15:30	0.4524	-0.00204	-0.00632			15-4008-1657	14-8602-0515
3		Jun	6	17:35	0.5261	0.07167	0.222			14-4704-6573	21-1405-7504
4			15	17:10	1.038	0.5836	1.808	(+)		10-7289-4509	07-0283-5913
5		Aug	19	13:00	0.2332	-0.2212	-0.6852			06-6146-2893	13-3815-9200
6		Oct	6	16:10	0.08164	-0.3728	-1.155	(-)		12-8921-9741	09-7037-5766
7		Nov	17	15:00	0.4655	0.01109	0.03435			17-3808-7563	06-0217-5624
8		Dec	3	13:00	0.5035	0.0491	0.1521			03-4597-8397	00-1071-5589
9	2012	Jan	27	15:35	0.9211	0.4667	1.446	(+)		16-8421-0766	20-0143-3480
10		Mar	22	16:30	0.3104	-0.144	-0.4461			21-4652-4665	13-8731-7162
11		Apr	20	16:30	0.2238	-0.2306	-0.7145			14-8766-1512	11-4737-1713
12		May	2	14:45	0.3561	-0.09831	-0.3046			14-7614-0254	02-4860-9083
13		Oct	5	17:30	0.3118	-0.1426	-0.4418			20-0252-0929	11-4480-5563
14		Nov	9	16:50	0.3047	-0.1497	-0.4637			06-8912-5820	01-4372-5731
15		Dec	4	16:40	0.1255	-0.3289	-1.019	(-)		09-7399-9766	06-6988-4971
16			7	18:00	0.3328	-0.1216	-0.3767			08-3888-7269	05-7696-0069
17	2013	Mar	29	17:30	0.4391	-0.01529	-0.04738			20-7362-7128	15-1784-9888
18		May	9	17:15	0.3759	-0.07851	-0.2432			17-2216-3359	13-3747-6067
19			22	13:00	0.3196	-0.1348	-0.4177			20-3854-2322	05-4600-3511
20		Jun	13	14:35	0.3442	-0.1102	-0.3414			06-7935-4299	19-7954-2799
21		Aug	16	17:05	0.6189	0.1645	0.5097			02-7670-7538	12-6858-1224

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Menidia beryllina (Inland Silverside) Material: Unionized Ammonia  
 Protocol: EPA/821/R-02-012 (2002) Endpoint: Proportion Survived Source: Reference Toxicant-REF



Mean: 0.4141 Count: 20 -1s Warning Limit: 0.1454 -2s Action Limit: -0.1233  
 Sigma: 0.2687 CV: 64.90% +1s Warning Limit: 0.6828 +2s Action Limit: 0.9515

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2006	Dec	6	16:00	0.504	0.0899	0.3346			13-3879-4132	02-0536-8570
2	2007	May	31	18:30	0.745	0.3309	1.231	(+)		05-6903-1620	03-4755-8871
3	2008	Dec	16	18:30	0.384	-0.0301	-0.112			19-5646-0735	00-5581-3990
4	2009	Feb	16	17:45	0.309	-0.1051	-0.3911			17-3709-3568	12-9465-5314
5	2010	Mar	25	15:50	0.196	-0.2181	-0.8117			09-1308-3756	05-0644-4487
6		Jun	28	18:25	0.468	0.0539	0.2006			11-7857-3399	16-6636-4704
7	2011	Feb	11	17:40	1.382	0.9679	3.602	(+)	(+)	04-2948-6740	05-9149-5593
8		Apr	12	15:30	0.28	-0.1341	-0.4991			15-4008-1657	02-5516-7288
9		Jun	6	17:35	0.352	-0.0621	-0.2311			14-4704-6573	18-9149-8485
10			15	17:10	0.551	0.1369	0.5095			10-7289-4509	20-9693-2432
11		Aug	19	13:00	0.159	-0.2551	-0.9494			06-6146-2893	19-4961-3406
12		Nov	17	15:00	0.362	-0.0521	-0.1939			17-3808-7563	18-1085-6875
13		Dec	3	13:00	0.392	-0.0221	-0.08225			03-4597-8397	14-2469-1316
14	2012	Jan	27	15:35	0.545	0.1309	0.4872			16-8421-0766	20-3901-9455
15		May	2	14:45	0.258	-0.1561	-0.5809			14-7614-0254	04-4063-9462
16		Oct	5	17:30	0.189	-0.2251	-0.8377			20-0252-0929	02-8082-6967
17		Nov	9	16:50	0.278	-0.1361	-0.5065			06-8912-5820	10-0353-5749
18		Dec	7	18:00	0.268	-0.1461	-0.5437			08-3888-7269	18-3798-1139
19	2013	Mar	29	17:30	0.314	-0.1001	-0.3725			20-7362-7128	00-7877-4581
20		May	9	17:15	0.347	-0.0671	-0.2497			17-2216-3359	18-1799-7373
21		Jun	13	14:35	0.207	-0.2071	-0.7707			06-7935-4299	16-2815-3647



# CETIS Summary Report

Report Date: 21 Aug-13 09:33 (p 1 of 1)  
 Test Code: 127E392D | 03-1026-2061

## Reference Toxicant 96-h Acute Survival Test

NewFields

Batch ID: 15-4296-4272	Test Type: Survival	Analyst:
Start Date: 16 Aug-13 17:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: Laboratory Seawater
Ending Date: 20 Aug-13 16:30	Species: Menidia beryllina	Brine: Not Applicable
Duration: 95h	Source: Aquatic Biosystems, CO	Age:
Sample ID: 12-2796-1205	Code: 49313375	Client: Internal Lab
Sample Date: 27 Sep-11	Material: Total Ammonia	Project: Reference Toxicant
Receive Date: 27 Sep-11	Source: Reference Toxicant	
Sample Age: 689d 17h	Station: P110927.146	

## Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
21-1335-9259	Proportion Survived	<18.5	18.5	NA	17.6%		Dunnett Multiple Comparison Test

## Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
15-7497-8436	Proportion Survived	EC50	24.28	21.88	26.94		Trimmed Spearman-Kärber

## Proportion Survived Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	0.0%
18.5		3	0.7667	0.4798	1	0.7	0.9	0.06667	0.1155	15.06%	20.69%
27.2		3	0.3667	0	0.7461	0.2	0.5	0.08819	0.1528	41.66%	62.07%
35.8		3	0.06667	0	0.2101	0	0.1	0.03333	0.05774	86.6%	93.1%
49.9		3	0	0	0	0	0	0	0		100.0%
62.1		3	0	0	0	0	0	0	0		100.0%

## Proportion Survived Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	0.9	1	1
18.5		0.7	0.7	0.9
27.2		0.2	0.4	0.5
35.8		0	0.1	0.1
49.9		0	0	0
62.1		0	0	0

## Proportion Survived Binomials

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	9/10	10/10	10/10
18.5		7/10	7/10	9/10
27.2		2/10	4/10	5/10
35.8		0/10	1/10	1/10
49.9		0/10	0/10	0/10
62.1		0/10	0/10	0/10

**CETIS Test Data Worksheet**

Report Date: 21 Aug-13 09:33 (p 1 of 1)  
 Test Code: 03-1026-2061/127E392D

**Reference Toxicant 96-h Acute Survival Test** NewFields

Start Date: 16 Aug-13 17:05      Species: Menidia beryllina      Sample Code: 49313375  
 End Date: 20 Aug-13 16:30      Protocol: EPA/821/R-02-012 (2002)      Sample Source: Reference Toxicant  
 Sample Date: 27 Sep-11      Material: Total Ammonia      Sample Station: P110927.146

C-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	10	10	9	
0	D	2	3	10	10	
0	D	3	6	10	10	
18.5		1	7	10	7	
18.5		2	2	10	7	
18.5		3	9	10	9	
27.2		1	5	10	2	
27.2		2	1	10	4	
27.2		3	4	10	5	
35.8		1	16	10	0	
35.8		2	12	10	1	
35.8		3	8	10	1	
49.9		1	17	10	0	
49.9		2	13	10	0	
49.9		3	18	10	0	
62.1		1	11	10	0	
62.1		2	15	10	0	
62.1		3	14	10	0	

# CETIS Summary Report

Report Date: 21 Aug-13 09:37 (p 1 of 1)  
 Test Code: 107E38D2 | 02-7670-7538

## Reference Toxicant 96-h Acute Survival Test

NewFields

Batch ID: 15-4296-4272	Test Type: Survival	Analyst:
Start Date: 16 Aug-13 17:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: Laboratory Seawater
Ending Date: 20 Aug-13 16:30	Species: Menidia beryllina	Brine: Not Applicable
Duration: 95h	Source: Aquatic Biosystems, CO	Age:
Sample ID: 18-8481-0988	Code: 7057EEEEC	Client: Internal Lab
Sample Date: 27 Sep-11	Material: Unionized Ammonia	Project: Reference Toxicant
Receive Date: 27 Sep-11	Source: Reference Toxicant	
Sample Age: 689d 17h	Station: P110927.146	

## Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
19-9601-1550	Proportion Survived	<0.473	0.473	NA	17.6%		Dunnett Multiple Comparison Test

## Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
12-6858-1224	Proportion Survived	EC50	0.6189	0.5577	0.687		Trimmed Spearman-Kärber

## Proportion Survived Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	0.0%
0.473		3	0.7667	0.4798	1	0.7	0.9	0.06667	0.1155	15.06%	20.69%
0.691		3	0.3667	0	0.7461	0.2	0.5	0.08819	0.1528	41.66%	62.07%
0.923		3	0.06667	0	0.2101	0	0.1	0.03333	0.05774	86.6%	93.1%
1.02		3	0	0	0	0	0	0	0		100.0%
1.26		3	0	0	0	0	0	0	0		100.0%

## Proportion Survived Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	0.9	1	1
0.473		0.7	0.7	0.9
0.691		0.2	0.4	0.5
0.923		0	0.1	0.1
1.02		0	0	0
1.26		0	0	0

## Proportion Survived Binomials

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	9/10	10/10	10/10
0.473		7/10	7/10	9/10
0.691		2/10	4/10	5/10
0.923		0/10	1/10	1/10
1.02		0/10	0/10	0/10
1.26		0/10	0/10	0/10

**Reference Toxicant Test  
Water Quality Datasheet**

CLIENT ANAMAR	PROJECT Fort Pierce	SPECIES <i>Menidia beryllina</i>	PROTOCOL SERIM / NEWFIELDS SED021	TEST START DATE 16Aug13	TIME 1705
NEWFIELDS JOB NUMBER 860.0081.000	PROJECT MANAGER B. Hester	DILUTION WATER BATCH FSW081513.01	NEWFIELDS LABORATORY Port Gamble,	TEST END DATE 20Aug13	TIME 1630
REF TOX ID P110927.146	TOXICANT LOT # 111079	ORGANISM BATCH ABS 5756 mb			

**WATER QUALITY DATA**

Stock Preparation - Ammonia	TARGET CONCENTRATION value units	DAY	REP	DO (mg/L)		TEMP (C)		SALINITY (ppt)		pH		Date	Tech	FEEDING	
				>4.7		20 ± 1		25 ± 2		7.8 ± 0.5					
				D.O.	TEMP.	SALINITY	pH								
750mL Diluent	0 mg/L	0	All	6	7.1	6	19.7	2	25	5	8.1	8/16/13	mmms		
		1	1												
		2	2												
		3	3												
		4	1	6	6.7	6	19.8	2	25	5	7.9	8/17/13	JL		
Meas. Total:	Calc. UIA														
0.0569	0.002														
Add: 1.93 mL of Stock Soln. to : 750mL Diluent	17 mg/L	0	All	6	7.5	6	19.6	2	25	5	7.9	8/16/13	mmms		
		1	1												
		2	2												
		3	3												
		4	1	6	6.7	6	19.9	2	25	5	7.9	8/17/13	JL		
Meas. Total:	Calc. UIA														
18.5	0.473														
Add: 2.84 mL of Stock Soln. to : 750mL Diluent	25 mg/L	0	All	6	7.6	6	19.5	2	25	5	7.9	8/16/13	mmms		
		1	1												
		2	2												
		3	3												
		4	1	6	7.0	6	20.0	2	25	5	7.9	8/17/13	JL		
Meas. Total:	Calc. UIA														
10.22	0.691														
Add: 3.97 mL of Stock Soln. to : 750mL Diluent	35 mg/L	0	All	6	7.6	6	19.7	2	25	5	7.9	8/16/13	mmms		
		1	1												
		2	2												
		3	3												
		4	1	6	7.2	6	19.9	2	25	5	7.9	8/17/13	JL		
Meas. Total:	Calc. UIA														
35.8	0.923														
Add: 5.68 mL of Stock Soln. to : 750mL Diluent	50 mg/L	0	All	6	7.6	6	19.6	2	25	5	7.8	8/16/13	mmms		
		1	1												
		2	2												
		3	3												
		4	1												
Meas. Total:	Calc. UIA														
49.9	1.020														
Add: 7.38 mL of Stock Soln. to : 750mL Diluent	65 mg/L	0	All	6	7.6	6	19.5	2	25	5	7.8	8/16/13	mmms		
		1	1												
		2	2												
		3	3												
		4	1												
Meas. Total:	Calc. UIA														
62.1	1.260														

SPECIES  
*Menidia beryllina*

CLIENT	PROJECT	NEWFIELDS JOB NO.	PROJECT MANAGER	NEWFIELDS LABORATORY	PROTOCOL
ANAMAR	Fort Pierce	860.0081.000	B. Hester	Port Gamble /	SERIM / NEWFIELDS SED021
REF TOX ID	TOXICANT LOT #	ORGANISM BATCH			
P116927.146	111079	ABS 5756 Mb			

**SURVIVAL & BEHAVIOR DATA**

**OBSERVATION KEY**  
 N = normal  
 LOE = loss of equilibrium  
 Q = quiescent  
 DC = discoloration  
 NB = no body  
 F = Floating on Surface

INITIAL # OF ORGANISMS  
10

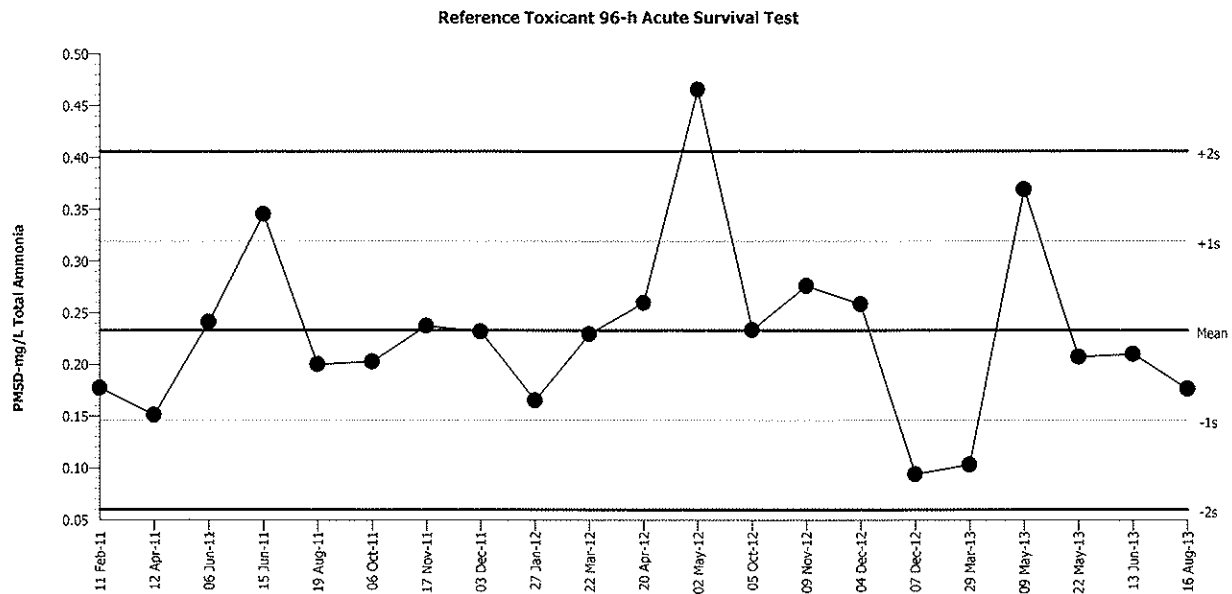
DATE	DATE	DATE	DATE
8/17	8.18	8/19	8/20
TECHNICIAN	TECHNICIAN	TECHNICIAN	TECHNICIAN
JL	BH	BG	JL

CLIENT/ NEWFIELDS ID	CONC.		REP	INITIAL NUMBER	8/17			8.18			8/19			8/20		
	value	units			#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS
Ref.Tox. - ammonia	0 mg/l		1	10	10	0	N	10	0	N	10	0	N	9	1	N
			2		10	0	↓	10	0	↓	10	0	N	10	0	N
			3		10	0	↓	10	0	↓	10	0	N	10	0	N
Ref.Tox. - ammonia	17 mg/l		1		9	1	N	8	1	N	8	0	N	7	1	N
			2		10	0	↓	9	1	N	7	2	N	7	0	N
			3		10	0	↓	10	0	N	10	0	N	9	1	N
Ref.Tox. - ammonia	25 mg/l		1		10	0	N	5	5	N	2	3	N	2	0	N
			2		10	0	↓	10	0	↓	4	6	N	4	0	N
			3		10	0	↓	8	2	↓	6	2	N	5	1	N
Ref.Tox. - ammonia	35 mg/l		1		7	3	0	0	7							
			2		8	2	↓	3	5	N	1	2	N	1	0	N
			3		9	1	↓	2	7	N	1	1	N	1	0	N
Ref.Tox. - ammonia	50 mg/l		1		2	8	0	0	2							
			2		0	10	NA									
			3		2	8	0	0	2							
Ref.Tox. - ammonia	65 mg/l		1		0	10	NA									
			2		0	10	↓									
			3		0	10	↓									

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Menidia beryllina (Inland Silverside) Material: Total Ammonia  
 Protocol: EPA/821/R-02-012 (2002) Endpoint: Proportion Survived Source: Reference Toxicant-REF

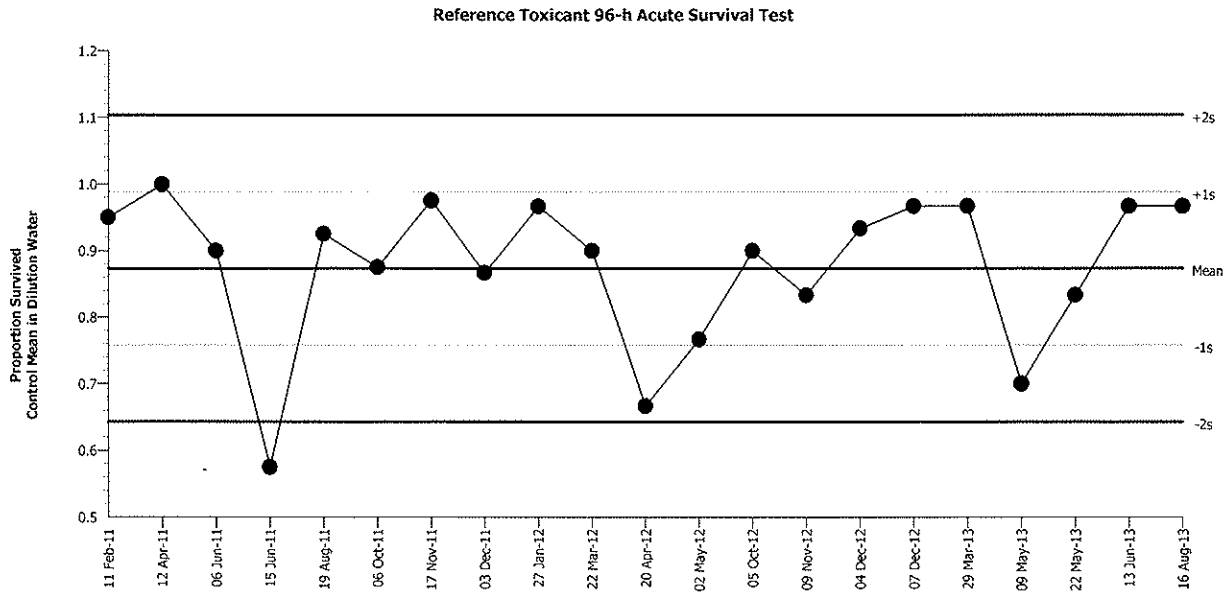


Mean: 0.2328 Count: 20 -1s Warning Limit: 0.1463 -2s Action Limit: 0.05976  
 Sigma: 0.08652 CV: 37.20% +1s Warning Limit: 0.3193 +2s Action Limit: 0.4058

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Feb	11	17:40	0.1773	-0.05548	-0.6413			00-0413-5303	11-7242-2866
2		Apr	12	15:30	0.151	-0.08184	-0.9459			13-1051-4181	20-0471-6553
3		Jun	6	17:35	0.241	0.008201	0.09479			00-9058-1631	17-5245-0199
4			15	17:10	0.3453	0.1125	1.301	(+)		17-8002-1401	05-7976-0808
5		Aug	19	13:00	0.1999	-0.03292	-0.3805			11-8516-4449	05-7847-6679
6		Oct	6	16:10	0.2026	-0.03018	-0.3488			03-8716-9751	04-8073-3193
7		Nov	17	15:00	0.2371	0.004346	0.05023			02-5818-9266	11-0569-2532
8		Dec	3	13:00	0.2319	-0.00095	-0.01094			07-1663-2602	04-1116-2487
9	2012	Jan	27	15:35	0.1651	-0.06773	-0.7828			06-7921-9387	00-8363-6930
10		Mar	22	16:30	0.2296	-0.00323	-0.03738			13-8750-4145	12-8385-7216
11		Apr	20	16:30	0.2597	0.02692	0.3111			07-0896-3675	15-9869-7437
12		May	2	14:45	0.4654	0.2326	2.688	(+)	(+)	15-3413-2419	20-0749-4984
13		Oct	5	17:30	0.2333	0.000549	0.006343			11-8705-5892	02-1881-7753
14		Nov	9	16:50	0.276	0.04316	0.4989			10-9947-7092	19-0937-6517
15		Dec	4	16:40	0.2584	0.02557	0.2956			04-2938-2554	18-4217-7890
16			7	18:00	0.09394	-0.1389	-1.605	(-)		07-1944-1107	09-2382-2727
17	2013	Mar	29	17:30	0.1032	-0.1296	-1.498	(-)		15-6629-7016	08-5086-4918
18		May	9	17:15	0.3688	0.136	1.572	(+)		05-2515-0422	04-5846-5135
19			22	13:00	0.2072	-0.02561	-0.2961			02-1650-1674	13-1703-5317
20		Jun	13	14:35	0.2099	-0.02287	-0.2643			20-5493-9860	10-1570-8714
21		Aug	16	17:05	0.1764	-0.05644	-0.6524			03-1026-2061	21-1335-9259

Reference Toxicant 96-h Acute Survival Test			NewFields
Test Type: Survival	Organism: Menidia beryllina (Inland Silverside)	Material: Total Ammonia	
Protocol: EPA/821/R-02-012 (2002)	Endpoint: Proportion Survived	Source: Reference Toxicant-REF	



**Mean:** 0.8733      **Count:** 20      **-1s Warning Limit:** 0.7582      **-2s Action Limit:** 0.6431  
**Sigma:** 0.1151      **CV:** 13.20%      **+1s Warning Limit:** 0.9884      **+2s Action Limit:** 1.104

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Feb	11	17:40	0.95	0.0767	0.6664			00-0413-5303	
2		Apr	12	15:30	1	0.1267	1.101	(+)		13-1051-4181	
3		Jun	6	17:35	0.9	0.0267	0.232			00-9058-1631	
4			15	17:10	0.575	-0.2983	-2.592	(-)	(-)	17-8002-1401	
5		Aug	19	13:00	0.925	0.0517	0.4492			11-8516-4449	
6		Oct	6	16:10	0.875	0.0017	0.01477			03-8716-9751	
7		Nov	17	15:00	0.975	0.1017	0.8836			02-5818-9266	
8		Dec	3	13:00	0.8667	-0.0066	-0.05734			07-1663-2602	
9	2012	Jan	27	15:35	0.9667	0.0934	0.8115			06-7921-9387	
10		Mar	22	16:30	0.9	0.0267	0.232			13-8750-4145	
11		Apr	20	16:30	0.6667	-0.2066	-1.795	(-)		07-0896-3675	
12		May	2	14:45	0.7667	-0.1066	-0.9262			15-3413-2419	
13		Oct	5	17:30	0.9	0.0267	0.232			11-8705-5892	
14		Nov	9	16:50	0.8333	-0.04	-0.3475			10-9947-7092	
15		Dec	4	16:40	0.9333	0.06	0.5213			04-2938-2554	
16			7	18:00	0.9667	0.0934	0.8115			07-1944-1107	
17	2013	Mar	29	17:30	0.9667	0.0934	0.8115			15-6629-7016	
18		May	9	17:15	0.7	-0.1733	-1.506	(-)		05-2515-0422	
19			22	13:00	0.8333	-0.04	-0.3475			02-1650-1674	
20		Jun	13	14:35	0.9667	0.0934	0.8115			20-5493-9860	
21		Aug	16	17:05	0.9667	0.0934	0.8115			03-1026-2061	

**Balboa Marina West**

**Mysid SPP Test Benchsheets**



CLIENT	PROJECT	NEWFIELDS JOB NO.	PROJECT MANAGER	SPECIES
City of Newport Beach	Balboa Marina West	860.0100.000	B. Hester	Mysidopsis bahia
				NEWFIELDS LABORATORY PROTOCOL
				Port Gamble / Bath 7 USEPA/USCOE 1998

**SURVIVAL & BEHAVIOR DATA**

OBSERVATION KEY	CLIENT/NEWFIELDS ID	CONC.		INITIAL NUMBER	DATE			DATE			DATE																													
		value	units		REP	#ALIVE	#DEAD	OBS	TECHNICIAN	TECHNICIAN	TECHNICIAN	#ALIVE	#DEAD	OBS																										
N = normal LOE= loss of equilibrium Q = quiescent DC = discoloration NB = no body F= Floating on Surface	Control /	0 %		1	10	0	N	10	0	N	10	0	8/17/13	JL	10	0	N	10	0	N	10	0	8/19/13	GR	10	0	N	10	0	N	10	0	8/20/13	MMS	10	0	N			
				2	10	0	N	10	0	N	10	0	N	10	0	8/18/13	BH	10	0	N	10	0	N	10	0	8/19/13	GR	10	0	N	10	0	N	10	0	8/20/13	MMS	10	0	N
				3	10	0	N	10	0	N	10	0	N	10	0	8/18/13	BH	10	0	N	10	0	N	10	0	8/19/13	GR	10	0	N	10	0	N	10	0	8/20/13	MMS	10	0	N
				4	10	0	N	10	0	N	9	1	N	9	0	8/18/13	BH	9	1	N	9	0	N	9	0	8/19/13	GR	9	0	N	9	0	N	9	0	8/20/13	MMS	9	0	N
				5	10	0	N	10	0	N	10	0	N	10	0	8/18/13	BH	10	0	N	10	0	N	10	0	8/19/13	GR	10	0	N	10	0	N	10	0	8/20/13	MMS	10	0	N

INITIAL # OF ORGANISMS  
10

CLIENT	PROJECT	NEWFIELDS JOB NO.	PROJECT MANAGER	SPECIES
City of Newport Beach	Balboa Marina West	860.0100.000	B. Hester	Mysidopsis bahia
				NEWFIELDS LABORATORY
				Port Gamble / Bath 7
				PROTOCOL
				USEPA/USCOE 1998

**SURVIVAL & BEHAVIOR DATA**

CLIENT/ NEWFIELDS ID	CONC. value	units	REP	INITIAL NUMBER	DATE		TECHNICIAN		DATE		TECHNICIAN		#ALIVE	#DEAD	OBS	
					8/17/13	8.18.13	8/19/13	8/20/13	Ju	BH	CR	MMS				
Area B-Comp /	10 %		1	10	10	0	N	10	0	10	0	N	10	0	N	
			2	10	0	N	10	0	10	0	10	0	N	10	0	N
			3	10	0	N	10	0	10	0	10	0	N	10	0	N
			4	10	0	N	9	0	IMS	0	9	0	IMS	9	0	J
			5	10	0	N	10	0	N	0	10	0	N	10	0	J
Area B-Comp /	50 %		1	10	0	N	10	0	10	0	10	0	N	10	0	N
			2	10	0	N	10	0	10	0	10	0	N	10	0	N
			3	10	0	N	10	0	10	0	10	0	N	10	0	N
			4	10	0	N	10	0	10	0	10	0	N	10	0	N
			5	10	0	N	10	0	10	0	10	0	N	10	0	N
Area B-Comp /	100 %		1	10	0	N	10	0	10	0	10	0	N	10	0	N
			2	10	0	N	10	0	10	0	10	0	N	10	0	N
			3	10	0	N	10	0	10	0	10	0	N	10	0	N
			4	10	0	N	10	0	10	0	10	0	N	10	0	N
			5	10	0	N	10	0	10	0	10	0	N	10	0	N

**OBSERVATION KEY**  
 N = normal  
 LOE= loss of equilibrium  
 Q = quiescent  
 DC = discoloration  
 NB = no body  
 F= Floating on Surface

INITIAL # OF ORGANISMS  
 10

CLIENT	PROJECT	NEWFIELDS JOB NO.	PROJECT MANAGER	SPECIES
City of Newport Beach	Balboa Marina West	860.0100.000	B. Hester	Mysidopsis bahia
				NEWFIELDS LABORATORY
				Port Gamble / Bath 7
				PROTOCOL
				USEPA/USCOE 1998

**SURVIVAL & BEHAVIOR DATA**

CLIENT/NEWFIELDS ID	CONC. value	REP	INITIAL NUMBER	DATE		TECHNICIAN		DATE		TECHNICIAN		#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS
				8/17/13	8.18.13	8/19/13	8/20/13	JL	BH	CR	MMS						
Area A-Comp /	10 %	1	10	N	10	0	N	10	0	N	9	0	N	9	0	N	
		2	10	N	10	0	N	10	0	N	9	0	N	9	0	N	
		3	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
		4	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
		5	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
Area A-Comp /	50 %	1	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
		2	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
		3	10	N	10	0	N	10	0	N	9	0	N	9	0	N	
		4	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
		5	10	N	10	0	N	10	0	N	9	0	N	9	0	N	
Area A-Comp /	100 %	1	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
		2	10	N	10	0	N	10	0	N	10	0	N	10	0	N	
		3	10	N	10	0	N	10	0	N	9	0	N	9	0	N	
		4	10	N	10	0	N	10	0	N	9	0	N	9	0	N	
		5	10	N	10	0	N	10	0	N	10	0	N	10	0	N	

0 ml 9 INB to 8/19/13

CLIENT City of Newport Beach	PROJECT Balboa Marina West	SPECIES Mysidopsis bahia	DILUTION WATER BATCH FSW081513.01	TEST START DATE 16Aug13	TIME 1545
NEWFIELDS JOB NUMBER 860.0100.000	PROJECT MANAGER B. Hester	NEWFIELDS LABORATORY Port Gamble Bath 7	PROTOCOL USEPA/USCOE 1998 / NEWFIELDS TOX067	TEST END DATE 20Aug13	TIME 1415

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	CONCENTRATION		DAY	REP	DO (mg/L)		TEMP. (C)		SALINITY		pH		Tech	FEEDING	
	value	units			meter	mg/L	meter	°C	meter	ppt	meter	unit		AM	PM
Control /	0 %		0	Stock	6	7.7	6	19.4	2	25	5	7.6	BSH		BSH
Control /	0 %		1	1	6	7.3	6	20.2	2	25	5	7.8	JL		JL
Control /	0 %		2	2	6	6.3	6	20.1	2	25	5	7.2	BSH		BSH
Control /	0 %		3	3	6	6.5	6	20.0	2	24	5	7.3	BSH		CR
Control /	0 %		4	4	6	5.9	6	19.5	2	26	5	7.5	JL		MMB



96 HOUR SUSPENDED PARTICULATE  
PHASE TEST  
WATER QUALITY DATASHEET

CLIENT City of Newport Beach	PROJECT Balboa Marina West	SPECIES Mysidopsis bahia	DILUTION WATER BATCH FSW081513.01	TEST START DATE 16Aug13	TIME 1545
NEWFIELDS JOB NUMBER 860.0100.000	PROJECT MANAGER B. Hester	NEWFIELDS LABORATORY Port Gamble Bath 7	PROTOCOL USEPAUSCOE 1998 / NEWFIELDS TOX067	TEST END DATE 20Aug13	TIME 1415

WATER QUALITY DATA

CLIENT/ NEWFIELDS ID	CONCENTRATION		DAY	REP	DO (mg/L)		TEMP. (C)		SALINITY (ppt)		pH		Date	Tech	FEEDING	
	value	units			meter	D.O.	meter	°C	meter	ppt	meter	unit			AM	PM
Area A-Comp /	10 %		0	Stock	6	7.7	6	19.3	2	25	5	8.1	8.16.13	BH	X	BH
Area A-Comp /	10 %		1	1	6	7.2	6	20.3	2	25	5	8.0	8/17	JL	JL	JL
Area A-Comp /	10 %		2	2	6	6.4	6	20.2	2	26	5	7.6	8.18	BH	BH	BH
Area A-Comp /	10 %		3	3	6	6.7	6	20.2	2	26	5	7.8	8/19	BG	CR	CR
Area A-Comp /	10 %		4	4	6	6.4	6	19.6	2	26	5	7.7	8/20	JL	MMB	MMB
Area A-Comp /	50 %		0	Stock	6	7.7	6	19.1	2	25	5	8.2	8.16.13	BH	X	BH
Area A-Comp /	50 %		1	1	6	7.1	6	20.3	2	26	5	8.1	8/17	JL	JL	JL
Area A-Comp /	50 %		2	2	6	6.6	6	20.2	2	25.26	5	7.7	8.18	BH	BH	BH
Area A-Comp /	50 %		3	3	6	6.2	6	20.3	2	24	5	7.8	8/19	BG	CR	CR
Area A-Comp /	50 %		4	4	6	6.4	6	19.6	2	26	5	7.8	8/20	JL	MMB	MMB
Area A-Comp /	100 %		0	Stock	6	7.7	6	19.0	2	25	5	8.3	8.16.13	BH	X	BH
Area A-Comp /	100 %		1	1	6	7.1	6	20.4	2	26	5	8.1	9/17	JL	JL	JL
Area A-Comp /	100 %		2	2	6	6.4	6	20.5	2	25.26	5	7.7	8.19	BH	BH	BH
Area A-Comp /	100 %		3	3	6	6.7	6	20.3	2	26	5	7.8	8/19	BG	CR	CR
Area A-Comp /	100 %		4	4	6	6.6	6	19.6	2	27	5	8.0	8/20	JL	MMB	MMB

① MC 8.18.13 BH

**96 HOUR SUSPENDED PARTICULATE  
PHASE TEST  
WATER QUALITY DATASHEET**

CLIENT City of Newport Beach NEWFIELDS JOB NUMBER 860.0100.000	PROJECT Balboa Marina West PROJECT MANAGER B. Hester	SPECIES <i>Mysidopsis bahia</i> NEWFIELDS LABORATORY Port Gamble Bath 7	DILUTION WATER BATCH FSW081513.01	TEST START DATE 16Aug13	TIME 1545
PROTOCOL USEPA/USCOE 1998 / NEWFIELDS TOX067		TEST END DATE 20Aug13	TIME 1415		

**WATER QUALITY DATA**

CLIENT/NEWFIELDS ID	CONCENTRATION		DAY	REP	DO (mg/L)		TEMP. (C)		SALINITY		pH		Date	Tech	FEEDING	
	value	units			meter	mg/L	meter	°C	meter	ppt	meter	unit			AM	PM
Area B-Comp /	10 %		0	Stock	6	7.6	6	19.9	2	25	5	8.1	8/13	YAH	X	BA
Area B-Comp /	10 %		1	1	6	7.3	6	20.2	2	25	5	8.0	8/17	JL	JL	JL
Area B-Comp /	10 %		2	2	6	6.6	6	20.6	2	25	5	7.6	8/18	BAH	BAH	BAH
Area B-Comp /	10 %		3	3	6	6.7	6	20.3	2	26	5	7.8	8/19	BAH	CR	CR
Area B-Comp /	10 %		4	4	6	6.6	6	19.3	2	26	5	7.8	8/20	JL	MMS	X
Area B-Comp /	50 %		0	Stock	6	7.6	6	19.4	2	25	5	8.1	8/13	BAH	X	BAH
Area B-Comp /	50 %		1	1	6	7.3	6	20.3	2	25	5	8.0	8/17	JL	JL	JL
Area B-Comp /	50 %		2	2	6	6.6	6	20.6	2	25	5	7.6	8/18	BAH	BAH	BAH
Area B-Comp /	50 %		3	3	6	6.5	6	20.2	2	25	5	7.7	8/19	BAH	CR	CR
Area B-Comp /	50 %		4	4	6	5.5	6	19.6	2	26	5	7.6	8/20	JL	MMS	X
Area B-Comp /	100 %		0	Stock	6	7.7	6	19.2	2	25	5	8.1	8/13	BAH	X	BAH
Area B-Comp /	100 %		1	1	6	7.2	6	20.3	2	25	5	8.0	8/17	JL	JL	JL
Area B-Comp /	100 %		2	2	6	6.4	6	20.5	2	25	5	7.6	8/18	BAH	BAH	BAH
Area B-Comp /	100 %		3	3	6	7.1	6	20.2	2	26	5	7.8	8/19	BAH	CR	CR
Area B-Comp /	100 %		4	4	6	6.0	6	19.7	2	25	5	7.7	8/20	JL	MMS	X







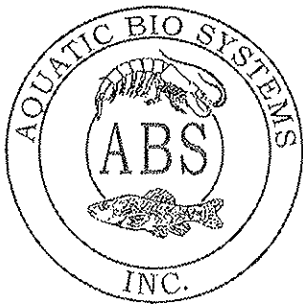


# NewFields

## ORGANISM RECEIPT LOG

Date: 8/15/13		Time: 1258		NewFields Batch No. ABS 5756 A6		
Organism / Project: Americamysis bahia / Fort Pierce, Balboa				Invoice Attached <input checked="" type="radio"/> Yes <input type="radio"/> No		
Source / Supplier: Aquatic Bio Systems				Contact: On file		
No. Ordered: 1500		No. Received: 1650		Source Batch: (Collection date, hatch date, etc.): hatched 8/11/13		
Condition of Organisms: (Good, fair, poor; describe.): Good			Approximate Size or Age: (Days from hatch, life stage, size class, etc.): 4 days			
Shipper: Fed Ex			B of L (Tracking No.) 5118 7588 5767 MSTR: 5756			
Condition of Container: (Good, fair, poor; describe.): Good			Received By: JL			
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include <u>Units</u> )	pH (Units)	Number Dead or Moribund	Technician (Initials)
1	10.0	22.3	30 ppt	7.0	—	JL
2	9.7	22.2	30 ↓	7.1	—	↓
Notes:						

1300 Blue Spruce Drive, Suite C  
Fort Collins, Colorado 80524



Toll Free: 800/331-5916  
Tel: 970/484-5091 Fax: 970/484-2514

### ORGANISM HISTORY

DATE: 8/14/2013

SPECIES: Americamysis bahia (formerly Mysidopsis)

AGE: 3 day

LIFE STAGE: Juvenile

HATCH DATE: 8/11/2013

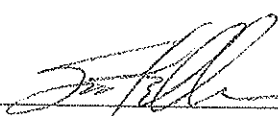
BEGAN FEEDING: Immediately

FOOD: Artemia sp.

#### Water Chemistry Record:

	Mean	Range
TEMPERATURE:	<u>25°C</u>	<u>23-26 °C</u>
SALINITY/CONDUCTIVITY:	<u>25 ppt</u>	<u>21-30 ppt</u>
TOTAL HARDNESS (as CaCO <sub>3</sub> ):	<u>--</u>	<u>--</u>
TOTAL ALKALINITY (as CaCO <sub>3</sub> ):	<u>145 mg/l</u>	<u>130-170 mg/l</u>
pH:	<u>8.13</u>	<u>7.62-8.23</u>

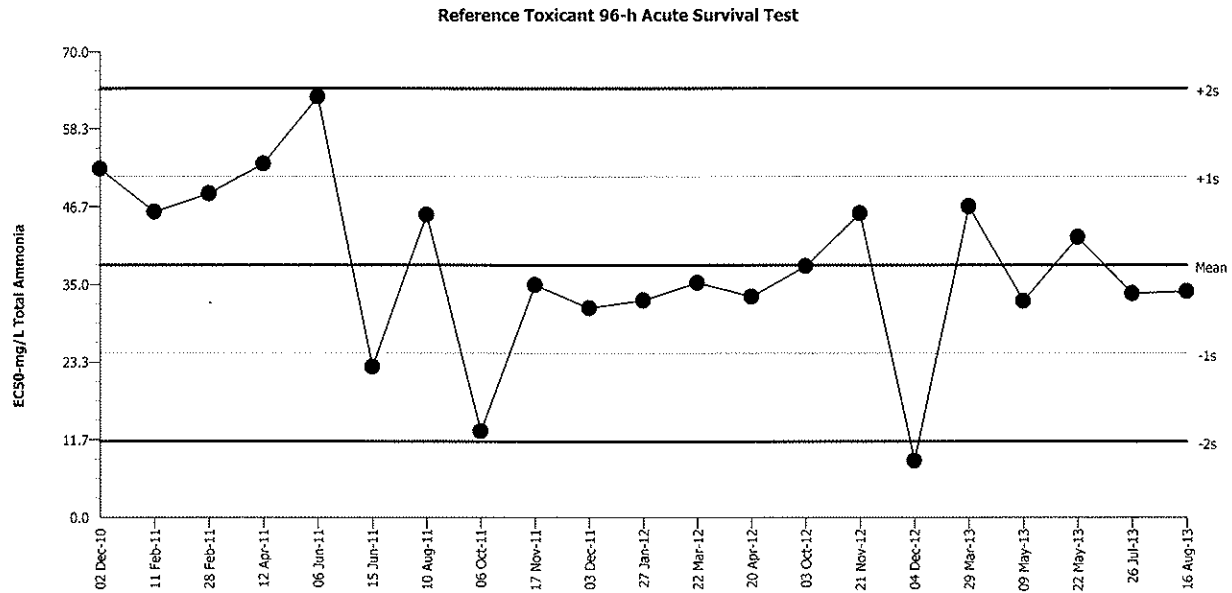
Comments:

  
\_\_\_\_\_  
Facility Supervisor

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Mysisopsis bahia (Atlantic Mysid) Material: Total Ammonia  
 Protocol: EPA/821/R-02-012 (2002) Endpoint: Proportion Survived Source: Reference Toxicant-REF



Mean: 37.92 Count: 20 -1s Warning Limit: 24.66 -2s Action Limit: 11.4  
 Sigma: 13.26 CV: 35.00% +1s Warning Limit: 51.18 +2s Action Limit: 64.44

Quality Control Data

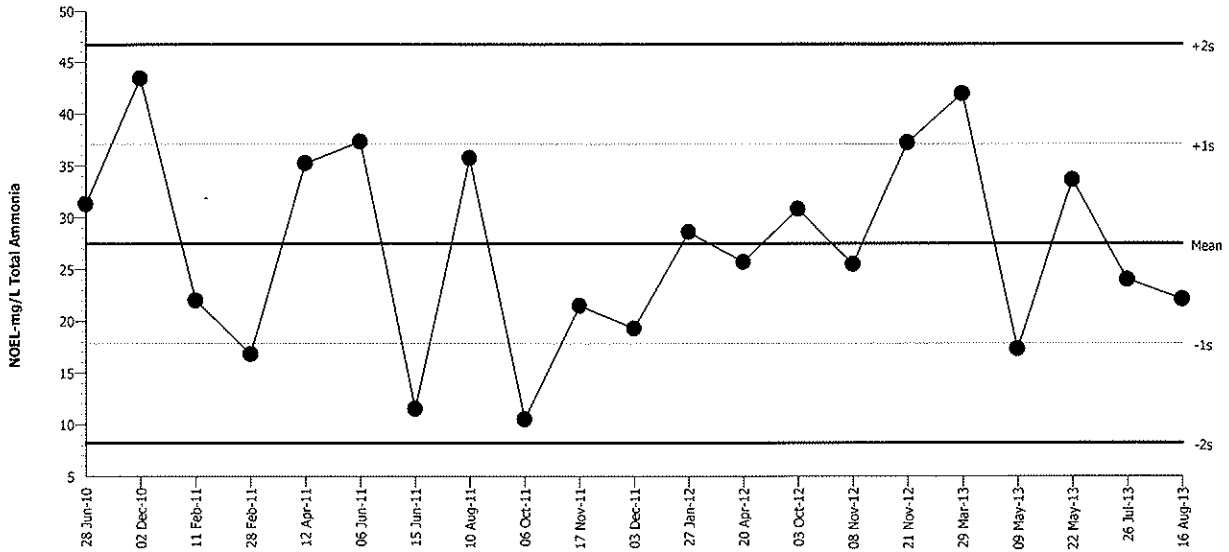
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2010	Dec	2	18:00	52.32	14.4	1.086	(+)		11-4173-3465	02-4623-3938
2	2011	Feb	11	16:40	45.9	7.976	0.6015			10-2732-1434	20-2787-3530
3			28	16:00	48.63	10.71	0.8077			11-5947-2467	09-9776-2428
4		Apr	12	15:00	53.05	15.13	1.141	(+)		12-3321-7626	16-6975-6573
5		Jun	6	17:45	63.12	25.2	1.901	(+)		21-3932-5256	09-3767-9806
6			15	17:25	22.62	-15.3	-1.154	(-)		14-3762-9842	18-1416-6418
7		Aug	10	15:40	45.44	7.516	0.5668			20-2054-7869	18-9294-7244
8		Oct	6	15:50	12.94	-24.98	-1.884	(-)		18-7519-1629	05-9242-8626
9		Nov	17	16:45	34.93	-2.99	-0.2255			13-3537-6481	00-0259-9321
10		Dec	3	13:30	31.48	-6.436	-0.4854			19-3494-8460	16-4061-1030
11	2012	Jan	27	15:00	32.64	-5.283	-0.3984			09-2178-0716	13-3774-7460
12		Mar	22	15:30	35.26	-2.656	-0.2003			03-4765-5570	05-2658-7571
13		Apr	20	16:15	33.19	-4.73	-0.3567			01-4991-3815	15-9267-8227
14		Oct	3	17:30	37.78	-0.138	-0.01041			17-4181-6907	12-8416-1482
15		Nov	21	16:15	45.67	7.746	0.5842			13-7797-8750	15-5284-2792
16		Dec	4	15:00	8.506	-29.41	-2.218	(-)	(-)	09-2916-0329	09-1278-2633
17	2013	Mar	29	16:00	46.69	8.77	0.6614			09-5280-7777	15-4155-1511
18		May	9	16:30	32.5	-5.418	-0.4086			00-6559-1335	13-1442-8916
19			22	11:50	42.09	4.174	0.3148			16-8626-7737	15-9199-1613
20		Jul	26	18:10	33.63	-4.292	-0.3237			00-6289-6815	19-7660-3839
21		Aug	16	16:00	33.96	-3.959	-0.2986			11-6472-8917	02-9301-5891

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Mysidopsis bahia (Atlantic Mysid) Material: Total Ammonia  
 Protocol: EPA/821/R-02-012 (2002) Endpoint: Proportion Survived Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test



Mean: 27.46 Count: 20 -1s Warning Limit: 17.84 -2s Action Limit: 8.228  
 Sigma: 9.616 CV: 35.00% +1s Warning Limit: 37.08 +2s Action Limit: 46.69

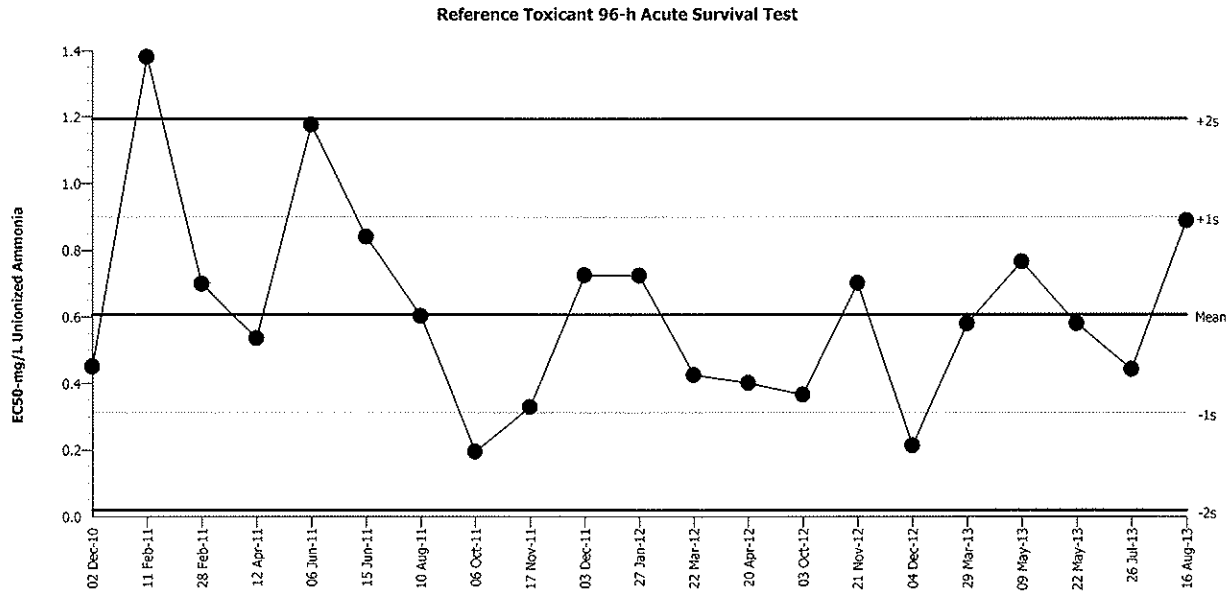
Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2010	Jun	28	17:30	31.3	3.84	0.3993			05-0585-5496	17-2000-7931
2		Dec	2	18:00	43.4	15.94	1.658	(+)		11-4173-3465	06-9709-2290
3	2011	Feb	11	16:40	22	-5.46	-0.5678			10-2732-1434	00-5222-2559
4			28	16:00	16.8	-10.66	-1.109	(-)		11-5947-2467	11-7619-8478
5		Apr	12	15:00	35.2	7.74	0.8049			12-3321-7626	03-3677-3705
6		Jun	6	17:45	37.3	9.84	1.023	(+)		21-3932-5256	17-1241-4200
7			15	17:25	11.5	-15.96	-1.66	(-)		14-3762-9842	01-7782-7560
8		Aug	10	15:40	35.7	8.24	0.8569			20-2054-7869	21-0548-6275
9		Oct	6	15:50	10.5	-16.96	-1.764	(-)		18-7519-1629	13-7543-6014
10		Nov	17	16:45	21.5	-5.96	-0.6198			13-3537-6481	18-2175-1220
11		Dec	3	13:30	19.3	-8.16	-0.8486			19-3494-8460	09-6250-4785
12	2012	Jan	27	15:00	28.6	1.14	0.1186			09-2178-0716	18-0481-0534
13		Apr	20	16:15	25.7	-1.76	-0.183			01-4991-3815	04-6855-5414
14		Oct	3	17:30	30.8	3.34	0.3473			17-4181-6907	11-2468-3245
15		Nov	8	16:30	25.5	-1.96	-0.2038			00-7233-3435	12-1979-9484
16			21	16:15	37.2	9.74	1.013	(+)		13-7797-8750	20-4087-6937
17	2013	Mar	29	16:00	41.9	14.44	1.502	(+)		09-5280-7777	01-6350-1611
18		May	9	16:30	17.3	-10.16	-1.057	(-)		00-6559-1335	18-8726-8367
19			22	11:50	33.6	6.14	0.6385			16-8626-7737	02-0537-4965
20		Jul	26	18:10	24	-3.46	-0.3598			00-6289-6815	07-9062-3428
21		Aug	16	16:00	22.1	-5.36	-0.5574			11-6472-8917	19-2692-9685

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival Organism: Mysidopsis bahia (Atlantic Mysid) Material: Unionized Ammonia  
 Protocol: EPA/821/R-02-012 (2002) Endpoint: Proportion Survived Source: Reference Toxicant-REF



Mean: 0.6066 Count: 20 -1s Warning Limit: 0.3128 -2s Action Limit: 0.019  
 Sigma: 0.2938 CV: 48.40% +1s Warning Limit: 0.9004 +2s Action Limit: 1.194

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2010	Dec	2	18:00	0.4507	-0.1559	-0.5305			11-1426-1857	14-3418-5196
2	2011	Feb	11	16:40	1.381	0.774	2.634	(+)	(+)	04-6997-0727	06-8981-0189
3			28	16:00	0.699	0.09239	0.3145			01-3697-3281	08-4981-1925
4		Apr	12	15:00	0.5349	-0.07173	-0.2442			00-0465-6922	17-7268-2696
5		Jun	6	17:45	1.175	0.5688	1.936	(+)		11-9941-4678	12-1432-1692
6			15	17:25	0.8401	0.2335	0.7946			07-9341-1156	12-3439-1083
7		Aug	10	15:40	0.6022	-0.00436	-0.01484			20-3366-1129	18-5795-2155
8		Oct	6	15:50	0.1946	-0.412	-1.402	(-)		14-0756-4043	10-0088-0184
9		Nov	17	16:45	0.329	-0.2776	-0.9448			08-6602-5120	10-6569-0402
10		Dec	3	13:30	0.7256	0.119	0.4052			00-1472-1091	02-5571-6678
11	2012	Jan	27	15:00	0.7244	0.1178	0.4009			01-4803-1104	09-8323-0920
12		Mar	22	15:30	0.4255	-0.1811	-0.6163			10-1062-4084	21-0955-6989
13		Apr	20	16:15	0.4015	-0.2051	-0.698			04-8512-6186	19-3818-5020
14		Oct	3	17:30	0.3662	-0.2404	-0.8184			16-7035-7588	16-9881-1319
15		Nov	21	16:15	0.7017	0.09515	0.3238			03-3789-1371	01-2436-4560
16		Dec	4	15:00	0.2134	-0.3932	-1.338	(-)		05-7872-2266	13-0902-8811
17	2013	Mar	29	16:00	0.5794	-0.02715	-0.09242			18-2277-6297	16-9599-8914
18		May	9	16:30	0.7654	0.1588	0.5405			18-2970-9952	16-2259-8392
19			22	11:50	0.5801	-0.02655	-0.09036			14-6493-3472	05-6360-6461
20		Jul	26	18:10	0.4427	-0.1639	-0.5578			19-7248-3361	04-0785-8543
21		Aug	16	16:00	0.8884	0.2818	0.9591			01-3117-4348	16-1737-6048

Reference Toxicant 96-h Acute Survival Test

NewFields

Test Type: Survival

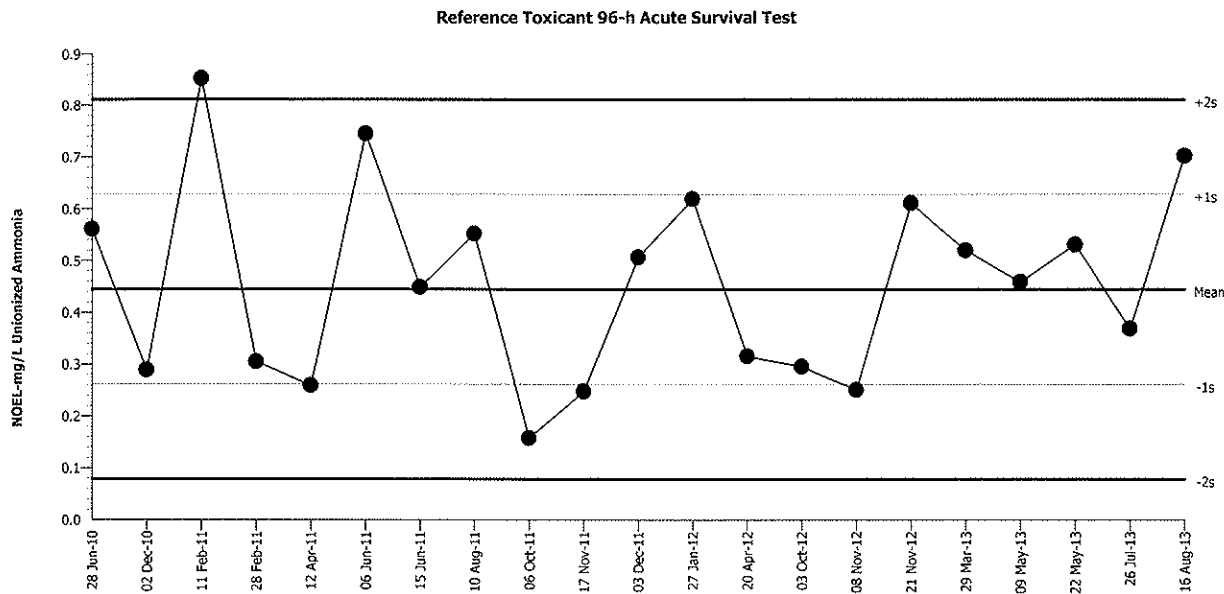
Organism: Mysidopsis bahia (Atlantic Mysid)

Material: Unionized Ammonia

Protocol: EPA/821/R-02-012 (2002)

Endpoint: Proportion Survived

Source: Reference Toxicant-REF



Mean: 0.4449      Count: 20      -1s Warning Limit: 0.2617      -2s Action Limit: 0.0785  
 Sigma: 0.1832      CV: 41.20%      +1s Warning Limit: 0.6281      +2s Action Limit: 0.8113

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2010	Jun	28	17:30	0.561	0.1161	0.6337			08-1002-4063	00-3568-2446
2		Dec	2	18:00	0.289	-0.1559	-0.851			11-1426-1857	09-0482-5974
3	2011	Feb	11	16:40	0.852	0.4071	2.222	(+)	(+)	04-6997-0727	15-9437-4208
4			28	16:00	0.305	-0.1399	-0.7636			01-3697-3281	01-9655-8662
5		Apr	12	15:00	0.259	-0.1859	-1.015	(-)		00-0465-6922	20-2718-7328
6		Jun	6	17:45	0.745	0.3001	1.638	(+)		11-9941-4678	13-3577-2553
7			15	17:25	0.449	0.0041	0.02238			07-9341-1156	17-4149-6830
8		Aug	10	15:40	0.552	0.1071	0.5846			20-3366-1129	18-5466-3882
9		Oct	6	15:50	0.158	-0.2869	-1.566	(-)		14-0756-4043	08-2814-5840
10		Nov	17	16:45	0.248	-0.1969	-1.075	(-)		08-6602-5120	10-8640-0946
11		Dec	3	13:30	0.507	0.0621	0.339			00-1472-1091	16-3244-2727
12	2012	Jan	27	15:00	0.619	0.1741	0.9503			01-4803-1104	01-9964-1951
13		Apr	20	16:15	0.316	-0.1289	-0.7036			04-8512-6186	15-4008-8416
14		Oct	3	17:30	0.296	-0.1489	-0.8128			16-7035-7588	05-8857-2012
15		Nov	8	16:30	0.251	-0.1939	-1.058	(-)		13-9124-2660	10-7731-9871
16			21	16:15	0.611	0.1661	0.9067			03-3789-1371	20-2596-1098
17	2013	Mar	29	16:00	0.52	0.0751	0.4099			18-2277-6297	01-5767-6666
18		May	9	16:30	0.459	0.0141	0.07697			18-2970-9952	10-3024-7327
19			22	11:50	0.531	0.0861	0.47			14-6493-3472	14-9177-1776
20		Jul	26	18:10	0.369	-0.0759	-0.4143			19-7248-3361	20-6060-1515
21		Aug	16	16:00	0.702	0.2571	1.403	(+)		01-3117-4348	00-7230-4827

# CETIS Summary Report

Report Date: 05 Sep-13 13:30 (p 1 of 1)  
 Test Code: 456C5A55 | 11-6472-8917

## Reference Toxicant 96-h Acute Survival Test

NewFields

<b>Batch ID:</b> 13-1418-4614	<b>Test Type:</b> Survival	<b>Analyst:</b>
<b>Start Date:</b> 16 Aug-13 16:00	<b>Protocol:</b> EPA/821/R-02-012 (2002)	<b>Diluent:</b> Laboratory Seawater
<b>Ending Date:</b> 20 Aug-13 15:30	<b>Species:</b> Mysidopsis bahia	<b>Brine:</b> Not Applicable
<b>Duration:</b> 96h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>
<b>Sample ID:</b> 06-8824-4515	<b>Code:</b> 2905C723	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 27 Sep-11	<b>Material:</b> Total Ammonia	<b>Project:</b> Reference Toxicant
<b>Receive Date:</b> 27 Sep-11	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> 689d 16h	<b>Station:</b> P110927.145	

## Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
19-2692-9685	Proportion Survived	22.1	32	26.59	13.4%		Bonferroni Adj t Test

## Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
02-9301-5891	Proportion Survived	EC50	33.96	31.68	36.41		Spearman-Kärber

## Proportion Survived Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	0.0%
22.1		3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	0.0%
32		3	0.6	0.3516	0.8484	0.5	0.7	0.05774	0.1	16.67%	37.93%
45.5		3	0.06667	0	0.2101	0	0.1	0.03333	0.05774	86.6%	93.1%
57.9		3	0	0	0	0	0	0	0		100.0%
70.3		3	0	0	0	0	0	0	0		100.0%

## Proportion Survived Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	1	1	0.9
22.1		1	0.9	1
32		0.5	0.6	0.7
45.5		0.1	0.1	0
57.9		0	0	0
70.3		0	0	0

## Proportion Survived Binomials

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	10/10	10/10	9/10
22.1		10/10	9/10	10/10
32		5/10	6/10	7/10
45.5		1/10	1/10	0/10
57.9		0/10	0/10	0/10
70.3		0/10	0/10	0/10



**CETIS Test Data Worksheet**

Report Date: 05 Sep-13 13:28 (p 1 of 1)  
 Test Code: 11-6472-8917/456C5A55

<b>Reference Toxicant 96-h Acute Survival Test</b>			<b>NewFields</b>		
<b>Start Date:</b> 16 Aug-13 16:00	<b>Species:</b> Mysidopsis bahia	<b>Sample Code:</b> 2905C723			
<b>End Date:</b> 20 Aug-13 15:30	<b>Protocol:</b> EPA/821/R-02-012 (2002)	<b>Sample Source:</b> Reference Toxicant			
<b>Sample Date:</b> 27 Sep-11	<b>Material:</b> Total Ammonia	<b>Sample Station:</b> P110927.145			

C-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	15	10	10	
0	D	2	14	10	10	
0	D	3	4	10	9	
22.1		1	1	10	10	
22.1		2	10	10	9	
22.1		3	18	10	10	
32		1	11	10	5	
32		2	6	10	6	
32		3	5	10	7	
45.5		1	2	10	1	
45.5		2	12	10	1	
45.5		3	7	10	0	
57.9		1	13	10	0	
57.9		2	3	10	0	
57.9		3	9	10	0	
70.3		1	16	10	0	
70.3		2	8	10	0	
70.3		3	17	10	0	

**CETIS Summary Report**

Report Date: 05 Sep-13 13:36 (p 1 of 1)  
 Test Code: 7D18FCC | 01-3117-4348

**Reference Toxicant 96-h Acute Survival Test**

**NewFields**

Batch ID: 18-1641-9946	Test Type: Survival	Analyst:
Start Date: 16 Aug-13 16:00	Protocol: EPA/821/R-02-012 (2002)	Diluent: Laboratory Seawater
Ending Date: 20 Aug-13 15:30	Species: Mysisidopsis bahia	Brine: Not Applicable
Duration: 96h	Source: Aquatic Biosystems, CO	Age:
Sample ID: 09-7876-1018	Code: 3A56B53A	Client: Internal Lab
Sample Date: 27 Sep-11	Material: Unionized Ammonia	Project: Reference Toxicant
Receive Date: 27 Sep-11	Source: Reference Toxicant	
Sample Age: 689d 16h	Station: P110927.145	

**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-7230-4827	Proportion Survived	0.702	0.813	0.7555	13.4%		Bonferroni Adj t Test

**Point Estimate Summary**

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
16-1737-6048	Proportion Survived	EC50	0.8884	0.8486	0.93		Spearman-Kärber

**Proportion Survived Summary**

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	0.0%
0.702		3	0.9667	0.8232	1	0.9	1	0.03333	0.05774	5.97%	0.0%
0.813		3	0.6	0.3516	0.8484	0.5	0.7	0.05774	0.1	16.67%	37.93%
1.138		3	0.06667	0	0.2101	0	0.1	0.03333	0.05774	86.6%	93.1%
1.156		3	0	0	0	0	0	0	0		100.0%
1.175		3	0	0	0	0	0	0	0		100.0%

**Proportion Survived Detail**

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	1	1	0.9
0.702		1	0.9	1
0.813		0.5	0.6	0.7
1.138		0.1	0.1	0
1.156		0	0	0
1.175		0	0	0

**Proportion Survived Binomials**

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	10/10	10/10	9/10
0.702		10/10	9/10	10/10
0.813		5/10	6/10	7/10
1.138		1/10	1/10	0/10
1.156		0/10	0/10	0/10
1.175		0/10	0/10	0/10

**CETIS Test Data Worksheet**

Report Date: 05 Sep-13 13:35 (p 1 of 1)  
 Test Code: 01-3117-4348/7D18FCC

<b>Reference Toxicant 96-h Acute Survival Test</b>				<b>NewFields</b>	
<b>Start Date:</b>	16 Aug-13 16:00	<b>Species:</b>	Mysidopsis bahia	<b>Sample Code:</b>	3A56B53A
<b>End Date:</b>	20 Aug-13 15:30	<b>Protocol:</b>	EPA/821/R-02-012 (2002)	<b>Sample Source:</b>	Reference Toxicant
<b>Sample Date:</b>	27 Sep-11	<b>Material:</b>	Unionized Ammonia	<b>Sample Station:</b>	P110927.145

C-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	15	10	10	
0	D	2	6	10	10	
0	D	3	7	10	9	
0.702		1	9	10	10	
0.702		2	11	10	9	
0.702		3	5	10	10	
0.813		1	10	10	5	
0.813		2	17	10	6	
0.813		3	13	10	7	
1.138		1	1	10	1	
1.138		2	12	10	1	
1.138		3	4	10	0	
1.156		1	18	10	0	
1.156		2	14	10	0	
1.156		3	16	10	0	
1.175		1	3	10	0	
1.175		2	8	10	0	
1.175		3	2	10	0	

REFERENCE TOXICANT TEST  
SURVIVAL DATASHEET

SPECIES  
*Americamysis bahia*

CLIENT	PROJECT	NEWFIELDS JOB NO.	PROJECT MANAGER	NEWFIELDS LABORATORY	PROTOCOL
ANAMAR	Fort Pierce	860.0081.000	B. Hester	Port Gamble /	SERIM / NEWFIELDS SED064

REF TOX ID	TOXICANT LOT #	ORGANISM BATCH

SURVIVAL & BEHAVIOR DATA

OBSERVATION KEY																		
N = normal LOE = loss of equilibrium Q = quiescent DC = discoloration NB = no body F = Floating on Surface				INITIAL # OF ORGANISMS 10			DATE 8/17			DATE 8.18			DATE 8/19			DATE 8/20		
				TECHNICIAN JL			TECHNICIAN BH			TECHNICIAN CR			TECHNICIAN MMB					
CLIENT/NEWFIELDS ID	CONC.		REP	INITIAL NUMBER	#ALIVE : #DEAD : OBS			#ALIVE : #DEAD : OBS			#ALIVE : #DEAD : OBS			#ALIVE : #DEAD : OBS				
	value	units																
Ref.Tox.- ammonia	0 mg/l		1		10	0	N	10	0	N	10	0	N	10	0	N		
			2		10	0	N	10	0	N	10	0	N	10	0	N		
			3		10	0	N	9	0	INB	9	0	N	9	0	N		
Ref.Tox.- ammonia	20 mg/l		1		10	0	N	10	0	N	10	0	N	10	0	N		
			2		10	0	N	10	0	N	10	0	N	9	0	INB		
			3		10	0	N	10	0	N	10	0	N	10	0	N		
Ref.Tox.- ammonia	30 mg/l		1		10	0	N	8	1	INB	7	1	N	5	2	N		
			2		10	0	N	8	0	2MB	6	1	INB	6	0	N		
			3		10	0	N	8	0	2MB	8	0	N	7	1	N		
Ref.Tox.- ammonia	45 mg/l		1		7	3	N	5	2	N	1	4	N	1	0	N		
			2		7	3	N	4	2	INB	2	2	N	1	1	N		
			3		7	3	N	5	2	N	0	5	N					
Ref.Tox.- ammonia	60 mg/l		1		5	5	Q	0	4	INB								
			2		5	5	N	0	3	2MB	0	1	N					
			3		4	6	N	1	2	INB	0	1	N					
Ref.Tox.- ammonia	75 mg/l		1		2	8	Q	0	2									
			2		1	9	N	0	1									
			3		0	10	N											

① Animal found 8.18.13 BH1

CLIENT ANAMAR	PROJECT Fort Pierce	SPECIES <i>Americamysis bahia</i>	PROTOCOL SERIM / NEWFIELDS SED064	TEST START DATE 16Aug13	TIME 1600
NEWFIELDS JOB NUMBER 860.0081.000	PROJECT MANAGER B. Hester	DILUTION WATER BATCH FSW081513.01	NEWFIELDS LABORATORY Port Gamble	TEST END DATE 20Aug13	TIME 1530
REF TOX ID FSW0815.1	TOXICANT LOT # 111079	ORGANISM BATCH			

P110927-146 145

WATER QUALITY DATA

Stock Preparation - Ammonia	TARGET CONCENTRATION		DAY	REP	DO (mg/L)		TEMP (C)		SALINITY (ppt)		pH		Date	Tech	FEEDING		
	value	units			>4.7		20 ± 1		25 ± 2		7.8 ± 0.5				AM	PM	
					D.O.	TEMP.	SALINITY	pH									
750mL Diluent	0	mg/L	0	All	6	7.6	6	19.5	2	25	5	8.1	8/16/13	MMB		BH	
			1	1											JL	JL	
			2	2												BH	→
			3	3												CR	→
			4	1	6	6.1	6	19.6	2	25	5	7.7	8/20	JL	MMB		
Meas. Total:	Calc. UIA																
0.2837																	
Add: 2.27 mL of Stock Soln. to : 750mL Diluent	20	mg/L	0	All	6	7.6	6	19.5	2	25	5	8.0	8/16/13	MMB		BH	
			1	1											JL	JL	
			2	2												BH	→
			3	3												CR	→
			4	1	6	6.3	6	19.6	2	25	5	7.8	8/20	JL	MMB		
Meas. Total:	Calc. UIA																
22.1																	
Add: 3.41 mL of Stock Soln. to : 750mL Diluent	30	mg/L	0	All	6	7.6	6	19.5	2	25	5	7.9	8/16/13	MMB		BH	
			1	1											JL	JL	
			2	2												BH	→
			3	3												CR	→
			4	1	6	6.6	6	19.8	2	26	5	7.8	8/20	JL	MMB		
Meas. Total:	Calc. UIA																
32.0																	
Add: 5.11 mL of Stock Soln. to : 750mL Diluent	45	mg/L	0	All	6	7.6	6	19.5	2	25	5	7.9	8/16/13	MMB		BH	
			1	1											JL	JL	
			2	2												BH	→
			3	3												CR	→
			4	1	6	6.6	6	19.8	2	26	5	7.9	8/20	JL	MMB		
Meas. Total:	Calc. UIA																
45.5																	
Add: 6.81 mL of Stock Soln. to : 750mL Diluent	60	mg/L	0	All	6	7.6	6	19.5	2	25	5	7.8	8/16/13	MMB		BH	
			1	1											JL	JL	
			2	2												BH	
			3	3												CR	
			4	1													
Meas. Total:	Calc. UIA																
57.9																	
Add: 8.51 mL of Stock Soln. to : 750mL Diluent	75	mg/L	0	All	6	7.6	6	19.5	2	25	5	7.7	8/16/13	MMB		BH	
			1	1											JL	JL	
			2	2												BH	
			3	3												CR	
			4	1													
Meas. Total:	Calc. UIA																
70.3																	



**Balboa Marina West**

**Larval Bivalve SPP Test Benchsheets**

# BIVALVE LARVAL DEVELOPMENT SUSPENDED PARTICULATE PHASE ENDPOINT DATA SHEET

SPECIES  
Mytilus sp. (mussel)

CLIENT City of Newport Beach	PROJECT Balboa Marina West	NEWFIELDS JOB NUM 860.0100.000	PROJECT MANAGER Bill Gardiner	NEWFIELDS LABORATORY Port Gamble Incubator	PROTOCOL USACE/EPA 1991
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## LARVAL OBSERVATION DATA

CLIENT/ NEWFIELDS ID	CONCENTRATION		VIAL NUMBER	REP	NUMBER NORMAL	NUMBER ABNORMAL	DATE	TECHNICIAN	COMMENTS
	value	units							
Area A / .	1 %			1	299	12			
				2	292	9			
				3	308	14			
				4	297	13			
				5	325	4			
Area A / .	10 %			1	263	7			
				2	288	7			
				3	309	16			
				4	306	6			
				5	335	14			
Area A / .	50 %			1	297	8			
				2	290	8			
				3	305	7			
				4	314	10			
				5	340	15			
Area A / .	100 %			1	333	8			
				2	306	7			
				3	286	10			
				4	309	7			
				5	317	14			



# BIVALVE LARVAL DEVELOPMENT SUSPENDED PARTICULATE PHASE ENDPOINT DATA SHEET

SPECIES  
Mytilus sp. (mussel)

CLIENT City of Newport Beach	PROJECT Balboa Marina West	NEWFIELDS JOB NUMBER 860.0100.000	PROJECT MANAGER Bill Gardiner	NEWFIELDS LABORATORY Port Gamble Incubator	PROTOCOL USACE/EPA 1991
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## LARVAL OBSERVATION DATA

CLIENT/ NEWFIELDS ID	CONCENTRATION		VIAL NUMBER	REP	NUMBER NORMAL	NUMBER ABNORMAL	DATE	TECHNICIAN	COMMENTS
	value	units							
Area B / .	1 %			1	284	8			
				2	323	12			
				3	312	6			
				4	324	4			
				5	298	11			
Area B / .	10 %			1	299	3			
				2					
				3	366	10			
				4	270	5			
				5	280	4			
Area B / .	50 %			1	290	3			
				2	322	3			
				3	300	5			
				4	322	2			
				5	298	8			
Area B / .	100 %			1	305	8			
				2	314	7			
				3	287	2			
				4	297	7			
				5	313	2			



**BIVALVE LARVAI DEVELOPMENTAL SUSPENDED PARTICULATE PHASE TEST  
WQ DATA SHEET**

<b>CLIENT</b> City of Newport Beach NEWFIELDS JOB NUMBER 860.0100.000	<b>PROJECT</b> Balboa Marina West PROJECT MANAGER Bill Gardiner	<b>SPECIES</b> Mytilus sp. (mussei)	<b>NEWFIELDS LABORATORY</b> Port Gamble Incubator	<b>PROTOCOL</b> USACE/EPA 1991
<b>TEST START DATE</b> 07Aug13	<b>TIME</b> 1700	<b>TEST END DATE</b> 09Aug13	<b>TIME</b>	
<b>DILUTION WATER BATCH</b> FSW080713.01		<b>TEMP Recorder (HOBO)#</b> NA		

**WATER QUALITY DATA**

CLIENT/ NEWFIELDS ID	CONCENTRATION		DAY	DO (mg/L)		TEMPERATURE (°C)		SALINITY		pH (units)		Ammonia		Sulfides		Date	Tech
	value	units		meter	mg/L	meter	°C	meter	ppt	meter	unit	AMMONIA		Sulfides			
												Techn.	mg/L	Techn.	mg/L		
			0	≥ 4.0		15 ± 1	32 ± 2	8.0 ± 1								8/7	MMS
Control / .			1	7.5	6	15.0	2	31	5	7.7	MMS	0.0074				8/8	GR
		0 %	2	7.7	6	16.5	2	30	5	7.8						8/9	MMS
			3	8.0	4	15.9	2	31	5	7.8	MMS	0.00					



**BIVALVE LARVAI DEVELOPMENTAL SUSPENDED PARTICULATE PHASE TEST  
WQ DATA SHEET**

<b>CLIENT</b> City of Newport Beach NEWFIELDS JOB NUMBER 860.0100.000	<b>PROJECT</b> Balboa Marina West PROJECT MANAGER Bill Gardiner	<b>SPECIES</b> Mytilus sp. (mussele)	<b>NEWFIELDS LABORATORY</b> Port Gamble Incubator	<b>PROTOCOL</b> USACE/EPA 1991
<b>TEST START DATE</b> 07Aug13	<b>TEST END DATE</b> 09Aug13	<b>DILUTION WATER BATCH</b> FSW080713.01	<b>TEMP Recorder (HOBO)#</b> NA	

**WATER QUALITY DATA**

CLIENT/NEWFIELDS ID	CONCENTRATION value	CONCENTRATION units	DAY	DO (mg/L)		TEMPERATURE (°C)		SALINITY (ppt)		pH (units)		Ammonia		Sulfides		Date	Tech
				meter	mg/L	meter	°C	meter	ppt	meter	unit	Techn.	mg/L	Techn.	mg/L		
Area A /	1 %		0	6	7.7	6	15.7	2	31	5	7.8	MMMS	0.00			8/7	MMMS
			1	6	7.7	6	16.6	2	30	5	7.8					8/8	CR
			2	6	8.1	6	15.2	2	30	5	7.8	MMMS	0.00			8/9	MMMS
			3														
Area A /	10 %		0	6	7.7	6	15.5	2	31	5	7.8	MMMS	0.00			8/7	MMMS
			1	6	7.8	6	16.6	2	31	5	7.9					8/8	CR
			2	6	8.1	6	15.1	2	31	5	7.8	MMMS	0.007			8/9	MMMS
			3														
Area A /	50 %		0	6	7.4	6	15.5	2	31	5	8.0	MMMS	0.41			8/7	MMMS
			1	6	7.8	6	16.6	2	31	5	7.9					8/8	CR
			2	6	8.2	6	15.1	2	31	5	7.9	MMMS	0.417			8/9	MMMS
			3														
Area A /	100 %		0	6	7.3	6	15.8	2	30	5	8.1	MMMS	0.959			8/7	MMMS
			1	6	7.8	6	16.6	2	30	5	8.0					8/8	CR
			2	6	8.2	6	15.1	2	31	5	8.6	MMMS	1.01			8/9	MMMS
			3														



**BIVALVE LARVAI DEVELOPMENTAL SUSPENDED PARTICULATE PHASE TEST  
WQ DATA SHEET**

<b>CLIENT</b> City of Newport Beach NEWFIELDS JOB NUMBER 860.0100.000	<b>PROJECT</b> Balboa Marina West PROJECT MANAGER Bill Gardiner	<b>SPECIES</b> Mytilus sp. (musse!) TEST START DATE 07Aug13 DILUTION WATER BATCH FSW080713.01	<b>NEWFIELDS LABORATORY</b> Port Gamble Incubator TEST END DATE 09Aug13 TEMP Recorder (HOB0)# NA	<b>PROTOCOL</b> USACE/EPA 1991
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Test conditions		WATER QUALITY DATA												
		DO (mg/L)		TEMPERATURE (°C)		SALINITY (ppt)		pH (units)		Ammonia		Sulfides		
CLIENT/NEWFIELDS ID	CONCENTRATION value	meter	meter	meter	meter	meter	meter	meter	meter	meter	meter	meter	meter	
Area B / .	1 %	0	6	7.7	6	15.5	2	31	5	7.8	MMMS	0.00	8/7	MMMS
		1	6	7.9	6	16.6	2	31	5	7.9	CR		8/8	CR
		2	6	8.0	6	15.1	2	30	5	7.8	MMMS	0.00	8/9	MMMS
		3												
Area B / .	10 %	0	6	7.7	6	15.5	2	31	5	7.8	MMMS	0.00	8/7	MMMS
		1	6	7.9	6	16.4	2	31	5	7.9	CR		8/8	CR
		2	6	8.1	6	15.1	2	31	5	7.8	MMMS	0.00	8/9	MMMS
		3												
Area B / .	50 %	0	6	7.8	6	15.6	2	30	5	7.8	MMMS	0.00	8/7	MMMS
		1	6	7.9	6	16.4	2	30	5	7.8	CR		8/8	CR
		2	6	8.1	6	15.1	2	30	5	7.8	MMMS	0.00	8/9	MMMS
		3												
Area B / .	100 %	0	6	7.8	6	15.8	2	30	5	7.7	MMMS	0.00	8/7	MMMS
		1	6	7.9	6	16.4	2	30	5	7.8	CR		8/8	CR
		2	6	8.1	6	15.3	2	30	5	7.8	MMMS	0.00	8/9	MMMS
		2												



**AQUATIC BIOSYSTEMS, INC.**

1300 BLUE SPRUCE DR., STE C  
 FORT COLLINS, CO 80524-2025  
 (970)484-5091

**Invoice**

<b>Date</b>	<b>Invoice #</b>
8/14/2013	99848

<b>Bill To</b>
Newfields NW. LLC Attn: Brian Hester/ Accounts Payable PO Box 216 Port Gamble, WA 98364

<b>Ship To</b>
Newfields NW. LLC 4770 NE View Dr PO BOX 216 Port Gamble, WA 98364

<b>Terms</b>	<b>Ship</b>	<b>Ship Via</b>	<b>P.O. No.</b>
Net 30	8/14/2013	FEDEX	

Quantity	Description	Price Each	Amount
1,500	Mysid Juveniles	0.30	450.00
150	Extra Mysid Juveniles	0.00	0.00
1,500	Menidia Larvae	0.60	900.00
150	Extra Menidia Larvae	0.00	0.00

Thank you for your business.	<b>Total</b>	\$1,350.00
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# NewFields

## ORGANISM RECEIPT LOG

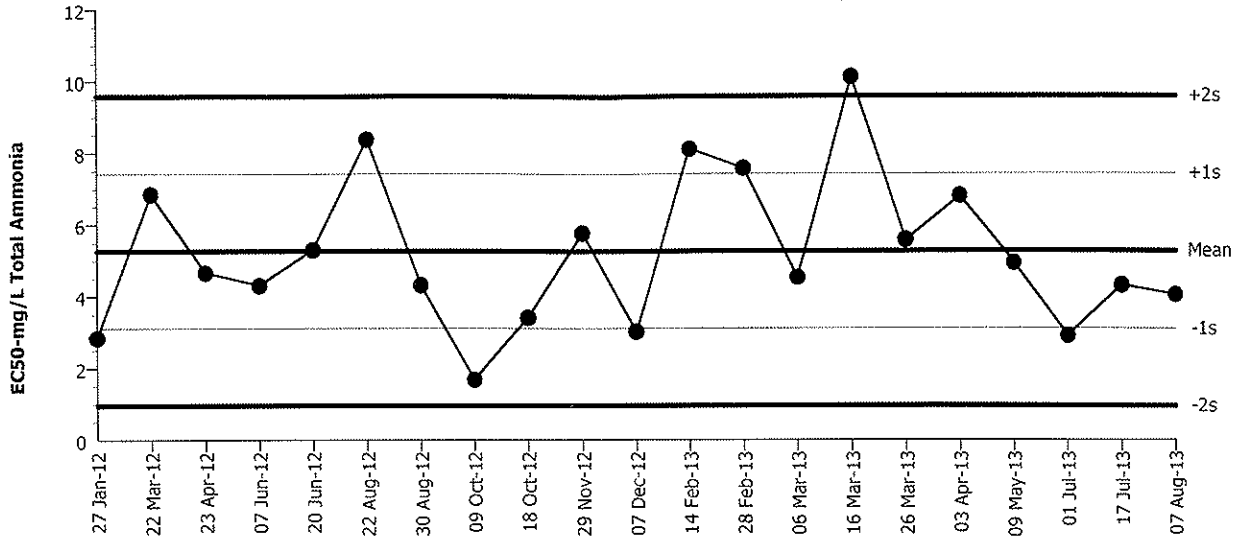
Date: 8.16.13		Time: 1155		NewFields Batch No. ARO 7843		
Organism / Project: Nereis virens / Fort Pierce				Invoice Attached Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Source / Supplier: Aquatic Research Organisms				Contact: Stan Sinitzki		
No. Ordered: 550		No. Received: 550+		Source Batch: (Collection date, hatch date, etc.): Field		
Condition of Organisms: (Good, fair, poor; describe.): Good			Approximate Size or Age: (Days from hatch, life stage, size class, etc.): Adult			
Shipper: FedEx			B of L (Tracking No.) 98419495 7843			
Condition of Container: (Good, fair, poor; describe.): Good			Received By: BH			
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	Number Dead or Moribund	Technician (Initials)
<del>*</del>	—	13.9	—	—	—	BH
Notes: * shipped on moist rock grass						

Mussel Shell Development Test

NewFields

Test Type: Development-Survival      Organism: Mytilus galloprovincialis (Bay Mussel)      Material: Total Ammonia  
 Protocol: EPA/600/R-95/136 (1995)      Endpoint: Combined Proportion Normal      Source: Reference Toxicant-REF

Mussel Shell Development Test



Mean: 5.27      Count: 20      -1s Warning Limit: 3.111      -2s Action Limit: 0.952  
 Sigma: 2.159      CV: 41.00%      +1s Warning Limit: 7.429      +2s Action Limit: 9.588

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2012	Jan	27	2.846	-2.424	-1.123	(-)		17-8035-0885	06-4475-5873
2		Mar	22	6.852	1.582	0.7325			08-5068-3541	09-7191-1867
3		Apr	23	4.66	-0.6096	-0.2824			02-7458-4371	07-2969-7564
4		Jun	7	4.304	-0.9665	-0.4476			20-4612-5080	14-0164-5214
5			20	5.296	0.02576	0.01193			21-1169-3016	00-2068-7937
6		Aug	22	8.376	3.106	1.439	(+)		03-0988-3309	14-8872-2540
7			30	4.311	-0.9592	-0.4443			00-6833-5106	09-9193-8473
8		Oct	9	1.678	-3.592	-1.664	(-)		06-6024-3093	07-1414-6248
9			18	3.41	-1.86	-0.8615			07-3550-9263	15-5292-9085
10		Nov	29	5.775	0.5045	0.2337			04-0681-3114	00-7625-5304
11		Dec	7	3.016	-2.254	-1.044	(-)		15-7850-6619	03-0562-1566
12	2013	Feb	14	8.112	2.842	1.316	(+)		02-6193-4857	04-9672-9086
13			28	7.574	2.304	1.067	(+)		06-9403-7957	07-8992-4017
14		Mar	6	4.538	-0.7323	-0.3392			20-1267-3706	09-5346-5604
15			16	10.13	4.857	2.25	(+)	(+)	14-2253-0526	18-0087-0374
16			26	5.579	0.3091	0.1432			03-8532-3895	00-6308-0782
17		Apr	3	6.805	1.535	0.7111			10-3604-5723	04-8356-0800
18		May	9	4.927	-0.3433	-0.159			00-6360-9095	16-4147-0802
19		Jul	1	2.895	-2.375	-1.1	(-)		19-5961-2730	13-0986-6895
20			17	4.313	-0.9566	-0.4431			18-2536-1347	00-8750-2223
21		Aug	7	4.051	-1.219	-0.5647			04-7788-4843	09-8595-7999



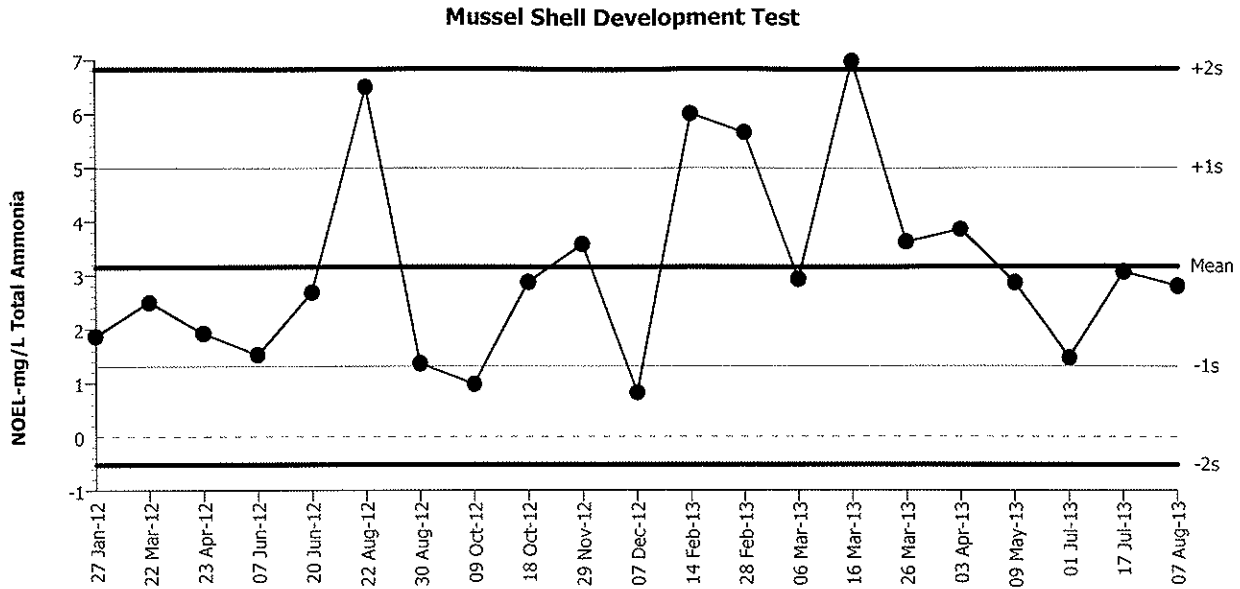
Mussel Shell Development Test

NewFields

Test Type: Development-Survival  
 Protocol: EPA/600/R-95/136 (1995)

Organism: Mytilus galloprovincialis (Bay Mussel)  
 Endpoint: Combined Proportion Normal

Material: Total Ammonia  
 Source: Reference Toxicant-REF

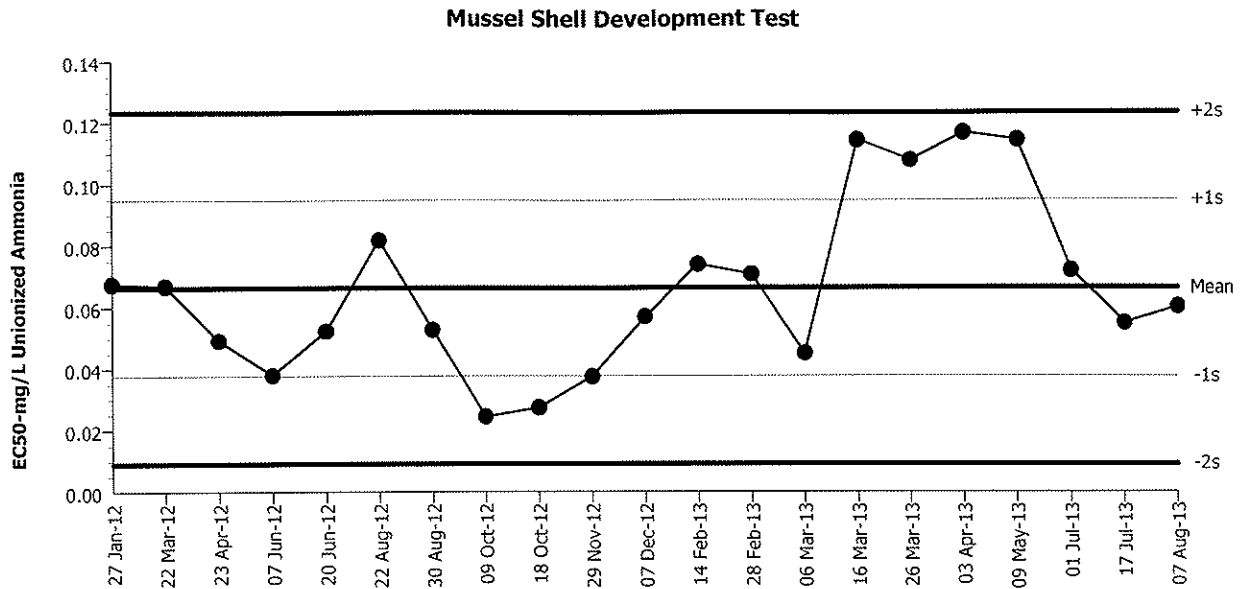


Mean: 3.149      Count: 20      -1s Warning Limit: 1.311      -2s Action Limit: -0.527  
 Sigma: 1.838      CV: 58.40%      +1s Warning Limit: 4.987      +2s Action Limit: 6.825

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2012	Jan	27	1.87	-1.279	-0.6959			17-8035-0885	19-6006-6064
2		Mar	22	2.5	-0.649	-0.3531			08-5068-3541	14-6034-1614
3		Apr	23	1.92	-1.229	-0.6687			02-7458-4371	11-3829-0609
4		Jun	7	1.52	-1.629	-0.8863			20-4612-5080	06-0541-2169
5			20	2.68	-0.469	-0.2552			21-1169-3016	01-0499-1137
6		Aug	22	6.5	3.351	1.823	(+)		03-0988-3309	04-0917-6749
7			30	1.36	-1.789	-0.9733			00-6833-5106	03-2629-4542
8		Oct	9	0.973	-2.176	-1.184	(-)		06-6024-3093	07-8913-5319
9			18	2.87	-0.279	-0.1518			07-3550-9263	18-1681-7487
10		Nov	29	3.58	0.431	0.2345			04-0681-3114	19-0538-4174
11		Dec	7	0.817	-2.332	-1.269	(-)		15-7850-6619	13-6604-7958
12	2013	Feb	14	6	2.851	1.551	(+)		02-6193-4857	07-3889-4891
13			28	5.65	2.501	1.361	(+)		06-9403-7957	16-1498-7518
14		Mar	6	2.93	-0.219	-0.1192			20-1267-3706	13-0769-0097
15			16	6.99	3.841	2.09	(+)	(+)	14-2253-0526	09-1011-9616
16			26	3.62	0.471	0.2563			03-8532-3895	01-1639-1779
17		Apr	3	3.85	0.701	0.3814			10-3604-5723	13-5448-8759
18		May	9	2.85	-0.299	-0.1627			00-6360-9095	00-7540-8630
19		Jul	1	1.46	-1.689	-0.9189			19-5961-2730	20-9160-8614
20			17	3.05	-0.099	-0.05386			18-2536-1347	04-3468-0815
21		Aug	7	2.79	-0.359	-0.1953			04-7788-4843	18-8631-2521

<b>Mussel Shell Development Test</b>			<b>NewFields</b>
<b>Test Type:</b> Development-Survival	<b>Organism:</b> Mytilus galloprovincialis (Bay Mussel)	<b>Material:</b> Unionized Ammonia	
<b>Protocol:</b> EPA/600/R-95/136 (1995)	<b>Endpoint:</b> Combined Proportion Normal	<b>Source:</b> Reference Toxicant-REF	

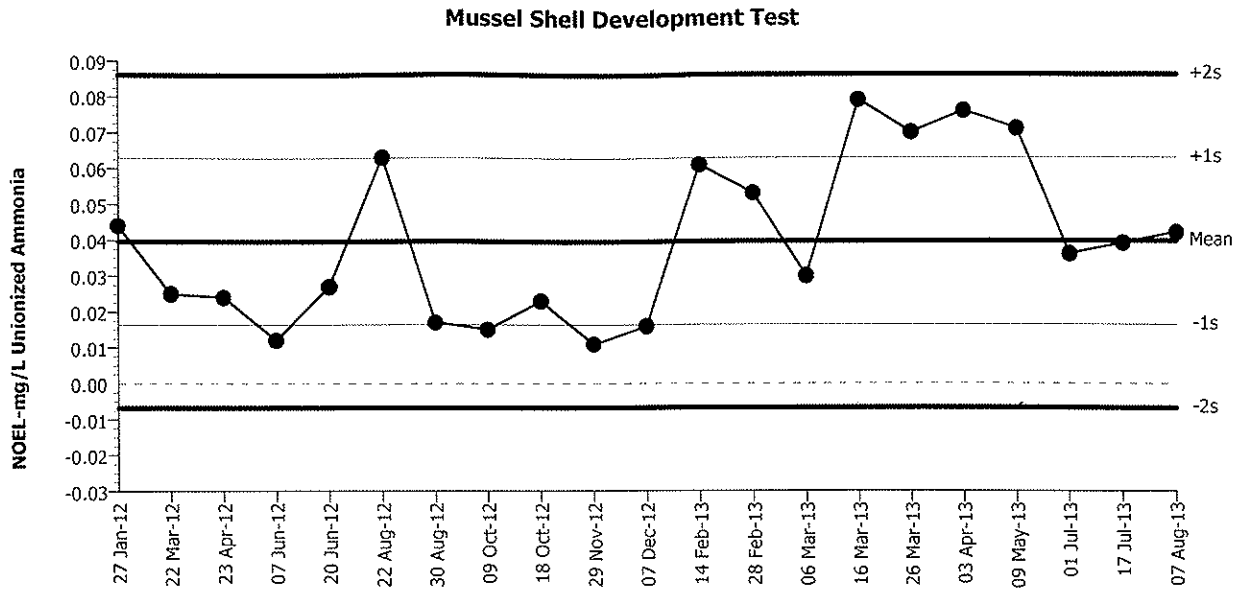


**Mean:** 0.06622      **Count:** 20      **-1s Warning Limit:** 0.03764      **-2s Action Limit:** 0.00906  
**Sigma:** 0.02858      **CV:** 43.20%      **+1s Warning Limit:** 0.0948      **+2s Action Limit:** 0.1234

**Quality Control Data**

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2012	Jan	27	0.06751	0.001294	0.04527			17-7315-3313	06-2387-0021
2		Mar	22	0.0669	0.0006785	0.02374			16-8530-3093	20-6643-2329
3		Apr	23	0.04914	-0.01708	-0.5976			11-9474-8117	17-4324-5637
4		Jun	7	0.03798	-0.02824	-0.9882			14-3239-7455	05-6059-9571
5			20	0.05226	-0.01396	-0.4885			16-3362-6154	15-3244-5350
6		Aug	22	0.08186	0.01564	0.5472			19-7550-7456	08-0736-4891
7			30	0.05265	-0.01357	-0.4747			18-5169-0947	02-7047-2220
8		Oct	9	0.02443	-0.04179	-1.462	(-)		08-9570-9100	07-8331-5723
9			18	0.02739	-0.03883	-1.359	(-)		18-9514-2443	00-3905-9363
10		Nov	29	0.03751	-0.02871	-1.004	(-)		15-6645-8664	13-4294-0618
11		Dec	7	0.0569	-0.009318	-0.326			11-6006-3509	05-8108-8018
12	2013	Feb	14	0.07388	0.007664	0.2682			14-1890-1951	14-7902-0800
13			28	0.0707	0.004482	0.1568			19-4434-4552	11-0678-0085
14		Mar	6	0.04499	-0.02123	-0.7429			18-3418-4255	07-5324-7355
15			16	0.1144	0.04823	1.687	(+)		11-4894-2693	12-9463-9515
16			26	0.1079	0.04166	1.458	(+)		10-2444-9875	09-9596-0674
17		Apr	3	0.1168	0.05063	1.771	(+)		20-6076-9735	05-3848-1619
18		May	9	0.1144	0.04818	1.686	(+)		14-3450-0734	06-3515-6667
19		Jul	1	0.07187	0.005651	0.1977			10-8846-7294	05-7595-2849
20			17	0.0548	-0.01142	-0.3996			10-3414-5102	08-1738-2772
21		Aug	7	0.06027	-0.005951	-0.2082			10-7217-0339	06-7338-0554

<b>Mussel Shell Development Test</b>			<b>NewFields</b>
<b>Test Type:</b> Development-Survival	<b>Organism:</b> Mytilus galloprovincialis (Bay Mussel)	<b>Material:</b> Unionized Ammonia	
<b>Protocol:</b> EPA/600/R-95/136 (1995)	<b>Endpoint:</b> Combined Proportion Normal	<b>Source:</b> Reference Toxicant-REF	



**Mean:** 0.0396      **Count:** 20      **-1s Warning Limit:** 0.01638      **-2s Action Limit:** -0.0068  
**Sigma:** 0.02322      **CV:** 58.60%      **+1s Warning Limit:** 0.06282      **+2s Action Limit:** 0.08604

**Quality Control Data**

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2012	Jan	27	0.044	0.0044	0.1895			17-7315-3313	14-7310-3808
2		Mar	22	0.025	-0.0146	-0.6288			16-8530-3093	00-2118-8798
3		Apr	23	0.024	-0.0156	-0.6718			11-9474-8117	16-8822-0741
4		Jun	7	0.012	-0.0276	-1.189	(-)		14-3239-7455	06-8748-6189
5			20	0.027	-0.0126	-0.5426			16-3362-6154	07-4796-6258
6		Aug	22	0.063	0.0234	1.008	(+)		19-7550-7456	17-2049-3239
7			30	0.017	-0.0226	-0.9733			18-5169-0947	11-3246-0073
8		Oct	9	0.015	-0.0246	-1.059	(-)		08-9570-9100	07-1156-4394
9			18	0.023	-0.0166	-0.7149			18-9514-2443	05-5566-0485
10		Nov	29	0.011	-0.0286	-1.232	(-)		15-6645-8664	07-1864-3452
11		Dec	7	0.016	-0.0236	-1.016	(-)		11-6006-3509	00-2066-3271
12	2013	Feb	14	0.061	0.0214	0.9216			14-1890-1951	16-6372-1200
13			28	0.053	0.0134	0.5771			19-4434-4552	04-8125-6089
14		Mar	6	0.03	-0.0096	-0.4134			18-3418-4255	11-0229-7491
15			16	0.079	0.0394	1.697	(+)		11-4894-2693	17-8368-9370
16			26	0.07	0.0304	1.309	(+)		10-2444-9875	00-8976-6127
17		Apr	3	0.076	0.0364	1.568	(+)		20-6076-9735	14-2423-4592
18		May	9	0.071	0.0314	1.352	(+)		14-3450-0734	19-5425-3899
19		Jul	1	0.036	-0.0036	-0.155			10-8846-7294	11-2659-9719
20			17	0.039	-0.0006	-0.02584			10-3414-5102	05-6701-2859
21		Aug	7	0.042	0.0024	0.1034			10-7217-0339	15-9321-6181

**CETIS Summary Report**

Report Date: 23 Sep-13 16:59 (p 1 of 1)  
 Test Code: 1C7BF1AB | 04-7788-4843

**Mussel Shell Development Test** NewFields

<b>Batch ID:</b> 14-7021-1611	<b>Test Type:</b> Development-Survival	<b>Analyst:</b>
<b>Start Date:</b> 07 Aug-13 19:00	<b>Protocol:</b> EPA/600/R-95/136 (1995)	<b>Diluent:</b> Laboratory Seawater
<b>Ending Date:</b> 09 Aug-13 17:30	<b>Species:</b> Mytilus galloprovincialis	<b>Brine:</b> Not Applicable
<b>Duration:</b> 46h	<b>Source:</b> Taylor Shellfish	<b>Age:</b>

<b>Sample ID:</b> 18-8301-8223	<b>Code:</b> 703C93EF	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 27 Sep-11	<b>Material:</b> Total Ammonia	<b>Project:</b> Reference Toxicant
<b>Receive Date:</b> 27 Sep-11	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> 680d 19h	<b>Station:</b> P110927.143	

**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
18-8631-2521	Combined Proportion Norm	2.79	5.51	3.921	13.9%		Dunnett's Multiple Comparison Test

**Point Estimate Summary**

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
09-8595-7999	Combined Proportion Norm	EC50	4.051	4.014	4.088		Spearman-Kärber

**Test Acceptability**

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
18-8631-2521	Combined Proportion Norm	PMSD	0.1392	NL - 0.25	No	Passes Acceptability Criteria

**Combined Proportion Normal Summary**

Conc-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	0.9444	0.9336	0.9553	0.9277	0.978	0.01677	0.02905	3.08%	0.0%
0.667		3	0.9486	0.9164	0.9808	0.8491	1	0.0498	0.08625	9.09%	-0.44%
1.44		3	0.9885	0.981	0.9959	0.9654	1	0.01153	0.01997	2.02%	-4.66%
2.79		3	0.979	0.9763	0.9817	0.9748	0.9874	0.004193	0.007262	0.74%	-3.66%
5.51		3	0.04822	0.04444	0.05199	0.04088	0.05975	0.005836	0.01011	20.96%	94.89%
10.3		3	0	0	0	0	0	0	0		100.0%

**Combined Proportion Normal Detail**

Conc-mg/L	Control Type	Rep 1	Rep 2	Rep 3
0	Dilution Water	0.978	0.9277	0.9277
0.667		0.8491	0.9969	1
1.44		0.9654	1	1
2.79		0.9748	0.9748	0.9874
5.51		0.04403	0.04088	0.05975
10.3		0	0	0

**CETIS Test Data Worksheet**

Report Date: 23 Sep-13 16:59 (p 1 of 1)  
 Test Code: 04-7788-4843/1C7BF1AB

**Mussel Shell Development Test**

**NewFields**

Start Date: 07 Aug-13 19:00    Species: Mytilus galloprovincialis    Sample Code: 703C93EF  
 End Date: 09 Aug-13 17:30    Protocol: EPA/600/R-95/136 (1995)    Sample Source: Reference Toxicant  
 Sample Date: 27 Sep-11    Material: Total Ammonia    Sample Station: P110927.143

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	D	1	13	318	319	319	311	
0	D	2	11	318	300	300	295	
0	D	3	9	318	312	312	295	
0.667		1	15	318	280	280	270	
0.667		2	7	318	325	325	317	
0.667		3	12	318	342	342	336	
1.44		1	6	318	314	314	307	
1.44		2	10	318	329	329	326	
1.44		3	4	318	340	340	333	
2.79		1	2	318	321	321	310	
2.79		2	8	318	318	318	310	
2.79		3	3	318	329	329	314	
5.51		1	1	318	320	320	14	
5.51		2	17	318	289	289	13	
5.51		3	16	318	349	349	19	
10.3		1	5	318	318	318	0	
10.3		2	18	318	312	312	0	
10.3		3	14	318	332	332	0	

**CETIS Summary Report**

Report Date: 23 Sep-13 17:02 (p 1 of 1)  
 Test Code: 3FE80563 | 10-7217-0339

Mussel Shell Development Test			NewFields
<b>Batch ID:</b>	20-0683-9386	<b>Test Type:</b>	Development-Survival
<b>Start Date:</b>	07 Aug-13 19:00	<b>Protocol:</b>	EPA/600/R-95/136 (1995)
<b>Ending Date:</b>	09 Aug-13 17:30	<b>Species:</b>	Mytilus galloprovincialis
<b>Duration:</b>	46h	<b>Source:</b>	Taylor Shellfish
<b>Analyst:</b>		<b>Diluent:</b>	Laboratory Seawater
		<b>Brine:</b>	Not Applicable
		<b>Age:</b>	
<b>Sample ID:</b>	10-8048-6900	<b>Code:</b>	4066EBF4
<b>Sample Date:</b>	27 Sep-11	<b>Material:</b>	Unionized Ammonia
<b>Receive Date:</b>	27 Sep-11	<b>Source:</b>	Reference Toxicant
<b>Sample Age:</b>	680d 19h	<b>Station:</b>	P110927.143
<b>Client:</b>	Internal Lab	<b>Project:</b>	Reference Toxicant

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-9321-6181	Combined Proportion Norm	0.042	0.082	0.05869	13.9%		Dunnett's Multiple Comparison Test

Point Estimate Summary							
Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
06-7338-0554	Combined Proportion Norm	EC50	0.06027	0.05982	0.06072		Spearman-Kärber

Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision	
15-9321-6181	Combined Proportion Norm	PMSD	0.1392	NL - 0.25	No	Passes Acceptability Criteria	

Combined Proportion Normal Summary											
Conc-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	3	0.9444	0.9336	0.9553	0.9277	0.978	0.01677	0.02905	3.08%	0.0%
0.01		3	0.9486	0.9164	0.9808	0.8491	1	0.0498	0.08625	9.09%	-0.44%
0.021		3	0.9885	0.981	0.9959	0.9654	1	0.01153	0.01997	2.02%	-4.66%
0.042		3	0.979	0.9763	0.9817	0.9748	0.9874	0.004193	0.007262	0.74%	-3.66%
0.082		3	0.04822	0.04444	0.05199	0.04088	0.05975	0.005836	0.01011	20.96%	94.89%
0.122		3	0	0	0	0	0	0	0		100.0%

Combined Proportion Normal Detail					
Conc-mg/L	Control Type	Rep 1	Rep 2	Rep 3	
0	Dilution Water	0.978	0.9277	0.9277	
0.01		0.8491	0.9969	1	
0.021		0.9654	1	1	
0.042		0.9748	0.9748	0.9874	
0.082		0.04403	0.04088	0.05975	
0.122		0	0	0	

**CETIS Test Data Worksheet**

Report Date: 23 Sep-13 17:01 (p 1 of 1)  
 Test Code: 10-7217-0339/3FE80563

**Mussel Shell Development Test**

**NewFields**

Start Date: 07 Aug-13 19:00 Species: Mytilus galloprovincialis Sample Code: 4066EBF4  
 End Date: 09 Aug-13 17:30 Protocol: EPA/600/R-95/136 (1995) Sample Source: Reference Toxicant  
 Sample Date: 27 Sep-11 Material: Unionized Ammonia Sample Station: P110927.143

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	D	1	2	318	319	319	311	
0	D	2	14	318	300	300	295	
0	D	3	10	318	312	312	295	
0.01		1	3	318	280	280	270	
0.01		2	13	318	325	325	317	
0.01		3	9	318	342	342	336	
0.021		1	12	318	314	314	307	
0.021		2	16	318	329	329	326	
0.021		3	7	318	340	340	333	
0.042		1	11	318	321	321	310	
0.042		2	5	318	318	318	310	
0.042		3	15	318	329	329	314	
0.082		1	18	318	320	320	14	
0.082		2	4	318	289	289	13	
0.082		3	17	318	349	349	19	
0.122		1	1	318	318	318	0	
0.122		2	6	318	312	312	0	
0.122		3	8	318	332	332	0	



BIVALVE LARVAL DEVELOPMENTAL SUSPENDED PARTICULATE PHASE TEST  
NH3 REFERENCE TOXICANT TEST

CLIENT AMEC	PROJECT NBSD	SPECIES <i>Mytilus sp. (musssel)</i>	NEWFIELDS LABORATORY Incubator	PROTOCOL USACE/EPA 1991
NEWFIELDS JOB NUMBER 860.0076.000	PROJECT MANAGER Port Gamble	QUANTITY OF STOCK TARGET: See Spiking Worksheet	QUANTITY OF DILUENT: 250 mL	INIT 8/7/13
Test ID P110927.143	LOT #: 111079	ACTUAL: 07Aug13	ACTUAL: 1900	DATE PREP: MMS
		TEST START DATE:	TIME	TIME
		07Aug13	1900	1730
			09Aug13	

WATER QUALITY DATA

DIL.TIN.WAT.BATCH	TEMP REC#	REFERENCE TOX. MATERIAL		REFERENCE TOXICANT					
		ammonium chloride	ammonia						
FSW080806	NA	ammonium chloride		ammonia					
TEST CONDITIONS									
CLIENT/ NEWFIELDS ID	CONCENTRATION		D.O.	TEMP.	SALINITY	TEMP(C)	SAL (ppt)	pH	TECHNICIAN
	value	units							
Ref.Tox.-Ammonia	0	mg/L	7.6	15.8	2	31	30 ± 2	8.00 ± 1	MMS 8/7
	2		8.0	15.5	2	31			MMS 8/9
Ref.Tox.-Ammonia	0	mg/L	7.6	15.7	2	31			MMS 8/7
	2		8.1	15.5	2	31			MMS 8/9
Ref.Tox.-Ammonia	0	mg/L	7.6	15.6	2	31			MMS 8/7
	2		8.1	15.6	2	31			MMS 8/9
Ref.Tox.-Ammonia	0	mg/L	7.6	15.8	2	31			MMS 8/7
	2		8.1	16.0	2	31			MMS 8/9
Ref.Tox.-Ammonia	0	mg/L	7.6	15.8	2	31			MMS 8/7
	2		8.1	15.1	2	31			MMS 8/9
Ref.Tox.-Ammonia	0	mg/L	7.6	15.8	2	31			MMS 8/7
	2		8.1	15.2	2	31			MMS 8/9



**LARVAL DEVELOPMENT  
AMMONIA REFERENCE TOXICANT  
ENDPOINT DATA SHEET**

SPECIES  
Mytilus sp. (mussel)

CLIENT AMEC	PROJECT NBSD	NEWFIELDS JOB # 860.0076.000	PROJECT MANAGER Brian Hester	NEWFIELDS LABORATORY Port Gamble Incubator	PROTOCOL USACE/EPA 1991
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**LARVAL OBSERVATION DATA**

TREATMENT	CONCENTRATION		VIAL NUMBER	REP	NUMBER NORMAL	NUMBER ABNORMAL	DATE	TECH	COMMENTS
	value	units							
Ref.Tox. - Ammonia	0 mg/L			1	311	8			
				2	295	5			
				3	295	17			
Ref.Tox. - Ammonia	0.75 mg/L			1	270	10			
				2	317	8			
				3	336	6			
Ref.Tox. - Ammonia	1.5 mg/L			1	307	7			
				2	326	3			
				3	333	7			
Ref.Tox. - Ammonia	3 mg/L			1	310	11			
				2	310	8			
				3	314	15			
Ref.Tox. - Ammonia	6 mg/L			1	14	306			
				2	13	276			
				3	19	330			
Ref.Tox. - Ammonia	12 mg/L			1	0	318			
				2	0	312			
				3	0	332			

stocking 307, 330, 312, 328, 313  
 $\bar{x} = 318$

# Mytilus NH<sub>3</sub> RT

Assumptions in Model

Stock ammonia concentration is 9,000 mg/L = 9 mg/mL

Actual Reading

9297

Test Solutions			Volume of stock to reach desired concentration	
Measured Concentration	Desired Concentration	Volume		
mg/L	mg/L	mL	mL stock to increase	
				SALT WATER (mL)
10.3	12	250		0.484
5.51	6	250		0.242
2.79	3	250		0.121
1.44	1.5	250		0.061
0.667	0.75	250		0.030
0.0119	0	250		0.000

**Balboa Marina West**

**Bioaccumulation Test Benchsheets**

CLIENT		PROJECT		NEWFIELDS JOB NO.		PROJECT MANAGER		NEWFIELDS LABORATORY		PROTOCOL		SPECIES								
City of Newport		Balboa Marina West				B. Gardiner				ITM (USEPA/USACE 1986), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008		Macoma nasuta & Nephthys caecoides								
CLIENT / NEWFIELDS ID		REF	Jar #	INITIAL # IF DIFF	Day	ENDPOINT DATA & OBSERVATIONS														
Comp B	3	1	1		1	8/28	8/29	8/30	8/31	9/01	9/02	9/03	9/04	9/05	9/06	9/07	9/08	9/09	9/10	
Control	3	2	2		2	CR	JL	JL	JL	JL	JL	MNMB	MNMB	JL	JL	JL	JL	MNMB	JL	
Comp B	5	3	3		3															
Comp A	4	4	4		4															
Comp B	1	5	5		5															
LA-3 Ref	2	6	6		6															
LA-3 Ref	5	7	7		7															
Comp B	4	8	8		8															
Control	2	9	9		9															
Control	4	10	10		10															
LA-3 Ref	1	11	11		11															
Comp B	2	12	12		12															
Comp A	1	13	13		13															
Comp A	3	14	14		14															
Control	5	15	15		15															

① E. JL 1/10/13

② Testing on treatment discontinued JL 9/10/13.

28-DAY BIOACCUMULATION TEST OBSERVATION DATA SHEET (DAYS 0-14)

CLIENT		PROJECT		NEWFIELDS JOB NO.		PROJECT MANAGER		NEWFIELDS LABORATORY		PROTOCOL		SPECIES				
City of Newport		Balboa Marina West				B. Gardiner				ITM (USEPA/USACE 1998), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008		Macoma nasuta & Nephthys caecoides				
ENDPOINT DATA & OBSERVATIONS																
CLIENT / NEWFIELDS ID	REP	JAR #	DATE / TECH. DATE / DIFF	INITIAL # IF	OBSERVATIONS											
					1	2	3	4	5	6	7	8	9	10	11	12
Control			8/28 CR	9/29 JU	9/30 JU	8/31 JU	9/01 JU	9/02 JU	9/03 MUMS	9/04 MUMS	9/05 JU	9/06 JU	9/07 JU	9/08 JU	9/09 MUMS	9/10 JU
Comp A		16			1 Cons	2 Cons	3 Cons	N	2 Cons	1 Cons	5 Cons	2 Cons	N	N	1 Cons	N
Comp A		17			12 Cons	6 Cons	3 Cons	1 Cons	1 Cons	N	N	1 Cons	1 Cons	3 Cons	2 Cons	1 Cons
LA-3 Ref		18			6 Cons	4 Cons	2 Cons	1 Cons	2 Cons	2 Cons	1 Cons	N	N	N	N	N
LA-3 Ref		19			2 Cons	1 Cons	N	N	N	N	F	F	↓	2 ↓	↓	↓
LA-3 Ref		20			6 Cons	3 Cons	2 Cons	2 Cons	2 Cons	2 Cons	2 Cons	2 Cons	2 Cons	2 Cons	2 Cons	2 Cons

28-DAY BIOACCUMULATION TEST OBSERVATION DATA SHEET (DAYS 15-28)

CLIENT		PROJECT		NEWFIELDS JOB NO.		PROJECT MANAGER		NEWFIELDS LABORATORY		PROTOCOL		SPECIES							
City of Newport		Balboa Marina West				B. Gardiner				ITM (USEPA/USACE 1998), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008		Macoma nasuta & Nephys caecoides							
ENDPOINT DATA & OBSERVATIONS																			
CLIENT / NEWFIELDS ID	REP #	DATE / TECH.	Day	INITIAL # IF DIFF	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Number Remaining
Comp B	3		0																68
Control	3		0		2 Cons	N	1 Cons	2 Cons	2 Cons	2 Cons	3 Cons	3 Cons	1 MC	1 Cons	2 Cons	2 Cons	1 Cons	3 Cons	29
Comp B	5		0																67
Comp A	4		0		N	N	1 Cons	2 Cons	2 Cons	1 Cons	N	N	N	N	2 Cons	2 Cons	1 Cons	1 Cons	66
Comp B	1		0																66
LA-3 Ref	2				N	N	N	N	N	N	N	N	N	N	N	N	N	N	66
LA-3 Ref	5				N	N	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	1 Cons	65
Comp B	4		0																64
Control	2				3 Cons	4 Cons	4 Cons	4 Cons	4 Cons	5 Cons	4 Cons	5 Cons	4 Cons	4 Cons	4 Cons	4 Cons	2 Cons	1 MC	65
Control	4				2 Cons	3 Cons	4 Cons	3 Cons	4 Cons	5 Cons	5 Cons	3 Cons	2 Cons	3 Cons	3 Cons	3 Cons	3 Cons	4 Cons	65
LA-3 Ref	1		0		N	N	N	N	N	N	N	N	N	N	N	N	N	N	69
Comp B	2		0																67
Comp A	1				N	N	N	N	N	N	N	N	N	N	1 Cons	1 Cons	N	N	69
Comp A	3				N	N	N	N	N	N	N	N	N	N	N	N	N	N	63
Control	5				N	N	1 Cons	2 Cons	1 Cons	1 MC	1 Cons	1 Cons	2 Cons	1 Cons	2 Cons	3 Cons	2 Cons	2 Cons	70

Testing discontinued 9/13 MMB. ② 15, 16, 17, 18, 19, 20

CLIENT		PROJECT		NEWFIELDS JOB NO.		PROJECT MANAGER		NEWFIELDS LABORATORY		PROTOCOL		SPECIES																							
City of Newport		Baiboa Marina West				B. Gardiner				ITM (USEPA/USACE 1998), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008		Macoma nasuta & Nephys caecoides																							
ENDPOINT DATA & OBSERVATIONS																																			
CLIENT / NEWFIELDS ID	REP	Jar #	INITIAL # IF DIFF	DATE / TECHN.	Day	OBSERVATIONS		Date	Number Remaining																										
						15-18	19-24																												
Control	1	16				9/11	MWB	9/12	MWB	9/13	JL	9/14	JL	9/15	JL	9/16	MWB	9/17	MWB	9/18	JL	9/19	CR	9/20	CR	9/21	JL	9/22	JL	9/23	MWB	9/24	MWB		
Comp A	2	17				15	N	16	N	17	1 CONS	18	2 CONS	19	2 CONS	20	1 CONS	21	2 CONS	22	1 CONS	23	1 CONS	24	1 CONS	25	1 CONS	26	1 CONS	27	1 CONS	28	3 CONS		64
Comp A	5	18				15	3 CONS	16	2 CONS	17	1 CONS	18	2 CONS	19	2 CONS	20	N	21	3 CONS	22	2 CONS	23	2 CONS	24	2 CONS	25	1 CONS	26	1 m(c)	27	N			69	
LA-3 Ref	4	19				15	N	16	N	17	N	18	N	19	N	20	N	21	N	22	N	23	N	24	N	25	N	N	N	N	N	N			62
LA-3 Ref	3	20				15	J	16	J	17	J	18	J	19	J	20	J	21	1 m(c)	22	J	J	J	J	J	J	J	J	J	J	J	J			68
						15	J	16	J	17	J	18	J	19	1 m(c)	20	J	21	1 m(c)	22	J	J	J	J	J	J	J	J	J	J	J	J			69

CLIENT City of Newport	PROJECT Balboa Marina West	SPECIES 1 Macoma nasuta & Nephrys caecoides	NEWFIELDS LABORATORY Port Gamble	PROTOCOL ITM (USEPA/USACE 1998), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008, SOP TOX041
NEWFIELDS JOB NUMBER	PROJECT MANAGER B. Gardiner	WATER DESCRIPTION North Hood Canal; filtered	TEST START DATE 27-Aug-2013	TEST END DATE 24-Sep-2013

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		FLOW
				meter	mg/L	meter	°C	meter	ppt	meter	unit	
Control /	0	1	16	6	8.1	6	15.2	2	31	5	8.0	MMS 8/27/13 47
		2	9	6	7.9	6	15.3	1	31	6	8.1	50
		3	2	6	7.2	6	14.6	1	31	6	7.9	46
		4	10	6	7.7	6	15.0	1	31	6	8.1	43
		5	15	6	7.9	6	15.0	1	31	6	8.1	38
Control /	1	1	16	6	7.5	6	15.4	2	31	5	7.8	CR 8/28 39
Control /	2	2	9	6	7.6	6	16.2	2	31	5	7.7	HA 8/29 50
Control /	3	3	2	6	6.3	6	15.9	2	31	5	7.8	JL 8/30 48
Control /	4	4	10	6	6.9	6	16.1	2	30	5	7.7	HA 8/31 39
Control /	5	5	15	6	7.2	6	15.4	2	31	5	7.9	JL 9/01 45
Control /	6	1	16	6	7.7	6	15.9	2	31	5	7.9	JL 9/02 38
Control /	7	2	9	6	7.3	6	15.4	2	31	5	8.1	MMS 9/03 50
Control /	8	3	2	6	6.7	6	14.7	2	31	5	7.8	MMS 9/04 56
Control /	9	4	10	6	7.1	6	14.9	2	31	5	7.7	JL 9/05 46
Control /	10	5	15	6	7.4	6	15.2	2	31	5	7.8	JL 9/06 39
Control /	11	1	16	6	8.0	6	15.3	2	31	5	8.4	JL 9/07 43
Control /	12	2	9	6	7.6	6	15.3	2	31	5	8.0	JL 9/08 40
Control /	13	3	2	6	6.6	6	13.6	2	31	5	8.0	MMS 9/09 49
Control /	14	4	10	6	7.1	6	14.7	2	31	5	7.7	JL 9/10 51



## 28 DAY BIOACCUMULATION WQ DATA SHEET

<b>CLIENT</b> City of Newport	<b>PROJECT</b> Baiboa Marina West	<b>SPECIES 1</b> Macoma nasuta & Nephthys caecoides	<b>NEWFIELDS LABORATORY</b> Port Gamble
<b>NEWFIELDS JOB NUMBER</b>	<b>PROJECT MANAGER</b> B. Gardiner	<b>WATER DESCRIPTION</b> North Hood Canal; filtered	<b>TEST START DATE</b> 27-Aug-2013
			<b>TEST END DATE</b> 24-Sep-2013
			<b>PROTOCOL</b> ITM (USEPA/USACE 1998), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008, SOP TOX041

WATER QUALITY DATA												
CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		FLOW
				meter	mg/L	meter	°C	meter	ppt	meter	unit	
Control /	15	5	15	7	9.1	7	15.2	2	31	5	7.8	41
Control /	16	1	16	7	8.0	7	14.7	2	31	5	8.0	39
Control /	17	2	9	7	7.4	7	15.4	2	31	5	7.8	48
Control /	18	3	2	7	7.3	7	14.6	2	31	5	7.9	56
Control /	19	4	10	7	7.6	7	15.1	2	31	5	7.9	54
Control /	20	5	15	7	7.6	7	15.0	2	31	5	7.8	40
Control /	21	1	16	7	7.7	7	14.7	2	31	5	7.8	38
Control /	22	2	9	7	7.4	7	15.3	2	31	5	7.8	50
Control /	23	3	2	7	6.6	7	15.0	2	31	5	7.6	50
Control /	24	4	10	7	7.2	7	15.7	2	31	5	7.7	47
Control /	25	5	15	7	7.5	7	15.4	2	31	5	7.7	42
Control /	26	1	16	7	7.9	7	15.4	2	31	5	7.8	55
Control /	27	2	9	7	7.3	7	15.1	2	31	5	7.6	49
		1	16	7	8.3	7	15.0	2	30	5	7.8	> 38
		2	9	7	7.6	7	15.1	1	31	7	7.6	
Control /	28	3	2	7	7.4	7	14.9	1	30	7	7.6	
		4	10	7	7.7	7	15.5	1	31	7	7.7	
		5	15	7	8.1	7	15.0	7	30	7	7.8	

CLIENT	CITY OF NEWPORT	PROJECT	BALBOA MARINA WEST	SPECIES 1	MACOMA NASUTA & NEPHYTYS CAECOIDES	NEWFIELDS LABORATORY	PROTOCOL
NEWFIELDS JOB NUMBER	B. GARDINER	PROJECT MANAGER	B. GARDINER	WATER DESCRIPTION	NORTH HOOD CANAL; FILTERED	TEST START DATE	27-AUG-2013
						TEST END DATE	24-SEP-2013

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		TECHNICIAN / DATE	FLOW
				meter	mg/L	meter	°C	meter	ppt	meter	unit		
LA-3 Ref/	0	1	11	6	7.9	6	14.8	2	31	5	8.1	MMB 8/27/13	52
		2	6	6	7.9	6	14.6	1	31	1	8.1		42
		3	20	6	7.8	6	14.8	1	31	1	8.0		39
		4	19	6	7.7	6	14.8	1	31	1	8.0		45
		5	7	6	7.5	6	14.7	1	31	1	8.2		41
LA-3 Ref/	1	1	11	6	7.5	6	15.4	2	31	5	7.8	CR 8/28	43
LA-3 Ref/	2	2	6	6	7.2	6	16.9	2	31	5	7.8	HK 8/29	39
LA-3 Ref/	3	3	20	6	7.6	6	16.1	2	31	5	7.9	JL 8/30	41
LA-3 Ref/	4	4	19	6	7.0	6	16.0	2	30	5	7.8	HK 8/31	39
LA-3 Ref/	5	5	7	6	7.4	6	15.4	2	31	5	7.9	JL 9/01	56
LA-3 Ref/	6	1	11	6	7.5	6	15.8	2	31	5	7.9	JL 9/02	43
LA-3 Ref/	7	2	6	6	7.7	6	14.9	2	31	5	8.3	MMB 9/3	55
LA-3 Ref/	8	3	20	6	7.5	6	14.8	2	31	5	8.0	MMB 9/4	45
LA-3 Ref/	9	4	19	6	6.9	6	14.9	2	31	5	7.7	JL 9/05	42
LA-3 Ref/	10	5	7	6	7.5	6	14.4	2	31	5	7.9	JL 9/06	46
LA-3 Ref/	11	1	11	6	7.7	6	15.5	2	31	5	8.0	JL 9/07	38
LA-3 Ref/	12	2	6	6	7.8	6	14.8	2	31	5	8.0	JL 9/08	51
LA-3 Ref/	13	3	20	6	7.8	6	15.5	2	31	5	7.9	MMB 9/9	46
LA-3 Ref/	14	4	19	6	7.0	6	14.9	2	31	5	7.8	JL 9/10	40

CLIENT	CITY OF NEWPORT	PROJECT	Balboa Marina West	SPECIES 1	<i>Macoma nasuta</i> & <i>Nephtys caecoides</i>	NEWFIELDS LABORATORY	Port Gamble	PROTOCOL	ITM (USEPA/USACE 1998), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2009, SOP TOX041
NEWFIELDS JOB NUMBER		PROJECT MANAGER	B. Gardiner	WATER DESCRIPTION	North Hood Canal, filtered	TEST START DATE	27-Aug-2013	TEST END DATE	24-Sep-2013

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		FLOW
				meter	mg/L	meter	°C	meter	ppt	meter	unit	
LA-3 Ref/	15	5	7	7	9.1	7	14.7	2	31	5	7.9	43
LA-3 Ref/	16	1	11	7	7.7	7	15.1	2	31	5	7.9	46
LA-3 Ref/	17	2	6	7	7.6	7	14.5	2	31	5	7.8	50
LA-3 Ref/	18	3	20	7	7.1	7	14.8	2	31	5	7.9	55
LA-3 Ref/	19	4	19	7	7.1	7	14.7	2	31	5	7.9	51
LA-3 Ref/	20	5	7	7	4.2	7	14.6	2	31	5	7.6	45
LA-3 Ref/	21	1	11	7	7.3	7	14.5	2	31	5	7.8	51
LA-3 Ref/	22	2	6	7	7.8	7	14.2	2	31	5	7.9	43
LA-3 Ref/	23	3	20	7	7.5	7	14.3	2	31	5	7.8	44
LA-3 Ref/	24	4	19	7	6.9	7	15.0	2	31	5	7.7	47
LA-3 Ref/	25	5	7	7	7.3	7	14.6	2	31	5	7.6	52
LA-3 Ref/	26	1	11	7	7.4	7	15.7	2	31	5	7.7	39
LA-3 Ref/	27	2	6	7	7.0	7	14.0	2	31	5	7.6	47
		1	11	7	7.9	7	15.6	2	31	5	7.8	>38
		2	6	7	8.0	7	14.5	1	31	5	7.7	
LA-3 Ref/	28	3	20	7	7.5	7	15.1	1	31	5	7.7	
		4	19	7	7.4	7	14.9	1	30	5	7.7	
		5	7	7	7.8	7	14.7	1	31	5	7.7	

① Aeration reinitiated to chamber, MMS 9/16/13.

CLIENT City of Newport	PROJECT Baiboa Marina West	SPECIES 1 <i>Macoma nasuta</i> & <i>Nephtys caecoides</i>	NEWFIELDS LABORATORY Port Gamble	PROTOCOL ITM (USEPA/USACE 1989), OTM (USEPA/USACE 1991), ASTM E 1811, SERIM 2008, SOP TOX041
NEWFIELDS JOB NUMBER B. Gardiner	PROJECT MANAGER B. Gardiner	WATER DESCRIPTION North Hood Canal; filtered	TEST START DATE 27-Aug-2013	TEST END DATE 24-Sep-2013

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		TECHNICIAN / DATE	FLOW
				meter	mg/L	meter	°C	meter	ppt	meter	unit		
Comp A /	0	1	13	6	7.8	6	15.0	2	31	5	8.0	MWBS 8/27/13	43
		2	17	6	7.9	6	15.2	1	31	1	8.1		45
		3	14	6	8.1	6	15.2	1	31	1	8.1		46
		4	4	6	7.8	6	14.6	1	31	1	8.1		48
		5	18	6	7.9	6	15.3	1	31	1	8.1		56
Comp A /	1	13	6	7.3	6	15.6	2	31	5	7.8	CR 8/28	52	
Comp A /	2	17	6	7.3	6	15.9	2	31	5	7.7	PK 8/29	56	
Comp A /	3	14	6	7.5	6	16.0	2	31	5	7.9	JL 8/30	39	
Comp A /	4	4	6	7.4	6	15.7	2	30	5	7.8	PK 8/31	55	
Comp A /	5	18	6	7.4	6	15.5	2	31	5	7.9	JL 9/01	40	
Comp A /	6	13	6	7.5	6	15.4	2	31	5	7.9	JL 9/02	39	
Comp A /	7	17	6	7.3	6	15.1	2	31	5	8.1	MWBS 9/13	44	
Comp A /	8	14	6	7.5	6	14.8	2	31	5	8.1	MWBS 9/14	48	
Comp A /	9	4	6	7.4	6	14.0	2	31	5	7.8	JL 9/05	45	
Comp A /	10	18	6	7.5	6	15.3	2	31	5	7.8	JL 9/06	40	
Comp A /	11	13	6	7.6	6	15.1	2	31	5	8.2	JL 9/07	39	
Comp A /	12	17	6	7.6	6	15.0	2	31	5	7.9	JL 9/08	56	
Comp A /	13	14	6	8.0	6	14.6	2	31	5	7.9	MWBS 9/19	39	
Comp A /	14	4	6	7.9	6	14.1	2	31	5	7.8	JL 9/10	56	

CLIENT City of Newport	PROJECT Balboa Marina West	SPECIES 1 Macoma nasuta & Nephthys caecoides	NEWFIELDS LABORATORY Port Gamble	PROTOCOL ITM (USEPA/USACE 1996), OTM (USEPA/USACE 1997), ASTM E 1611, SERIM 2008, SOP TOX041
NEWFIELDS JOB NUMBER	PROJECT MANAGER B. Gardiner	WATER DESCRIPTION North Hood Canal; filtered	TEST START DATE 27-Aug-2013	TEST END DATE 24-Sep-2013

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		TECHNICIAN / DATE	FLOW
				meter	mg/L	meter	°C	meter	ppt	meter	unit		
Comp A /	15	5	48	7	8.9	7	16.7	2	31	5	7.7	MWBS 9/11/13	38
Comp A /	16	1	13	7	7.6	7	15.0	2	31	5	7.9	MWBS 9/11/12	43
Comp A /	17	2	17	7	7.7	7	14.5	2	31	5	7.8	CR 9/13	56
Comp A /	18	3	14	7	7.6	7	15.2	2	31	5	8.1	JL 9/14	46
Comp A /	19	4	4	7	7.5	7	14.5	2	31	5	7.9	JL 9/15	39
Comp A /	20	5	18	7	7.1	7	15.0	2	31	5	7.8	MWBS 9/11/6	55
Comp A /	21	1	13	7	7.4	7	14.7	2	31	5	7.8	JL 9/17	44
Comp A /	22	2	17	7	7.4	7	16.1	2	31	5	7.8	JL 9/18	53
Comp A /	23	3	14	7	8.7.3	7	14.8	2	31	5	7.7	JL 9/19	47
Comp A /	24	4	4	7	7.6	7	14.9	2	31	5	7.7	CR 9/20	44
Comp A /	25	5	18	7	6.9	7	15.2	2	31	5	7.6	JL 9/21	39
Comp A /	26	1	13	7	7.4	7	15.1	2	31	5	7.2	JL 9/22	48
Comp A /	27	2	17	7	7.3	7	14.8	2	31	5	7.6	MWBS 9/23	42
Comp A /	1	13	7	7	7.9	7	15.1	2	30	5	7.7	MWBS 9/24/13	738
	2	17	7	7	8.1	7	15.1	2	31	7	7.8		
	3	14	7	7	8.2	7	15.3	2	31	7	7.8		
	4	4	7	7	7.9	7	14.4	2	31	7	7.7		
	5	18	7	7	7.9	7	15.1	2	30	7	7.7		

done 9/19/13 hr

CLIENT	CITY OF NEWPORT	PROJECT	Baitoa Marina West	SPECIES 1	Macoma nasuta & Nephthys caecoides	NEWFIELDS LABORATORY	Port Gamble	PROTOCOL	ITM (USEPA/USACE 1999), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008, SOP TOX041
NEWFIELDS JOB NUMBER		PROJECT MANAGER	B. Gardiner	WATER DESCRIPTION	North Hood Canal; filtered	TEST START DATE	27-Aug-2013	TEST END DATE	24-Sep-2013

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		TECHNICIAN / DATE	FLOW
				meter	D.O.	meter	%C	meter	ppt	meter	unit		
Comp B /	1	5	6	8.0	14.4	2	31	5	8.2	MMS 8/27/13	45		
	2	12	6	8.2	15.0	2	31	5	8.1	50			
	3	1	6	7.5	14.3	2	31	5	8.1	43			
	4	8	6	8.2	14.6	2	31	5	8.2	47			
	5	3	6	7.7	14.3	2	31	5	8.2	40			
Comp B /	1	5	6	7.4	15.3	2	31	5	7.8	CA 8/28	38		
Comp B /	2	12	6	7.0	15.9	2	31	5	7.7	JK 8/29	45		
Comp B /	3	1	6	7.3	15.6	2	31	5	7.8	JL 8/30	56		
Comp B /	4	8	6	7.2	16.2	2	30	5	7.8	JK 8/31	40		
Comp B /	5	3	6	7.3	15.5	2	31	5	7.9	JL 9/01	48		
Comp B /	6	1	6	6.9	15.2	2	31	5	7.9	JL 9/02	45		
Comp B /	7	12	6	7.0	15.4	2	31	5	8.0	MMS 9/13	55		
Comp B /	8	3	6	7.2	14.3	2	31	5	7.9	MMS 9/14	55		
Comp B /	9	4	6	7.6	14.5	2	31	5	7.8	JL 9/05	41		
Comp B /	10	5	6	7.4	14.0	2	31	5	7.8	JL 9/06	56		
Comp B /	11	1	6										
Comp B /	12	2											
Comp B /	13	3											
Comp B /	14	4											

① Treatment testing discontinued. JL 9/07/13.

CLIENT City of Newport	PROJECT Balboa Marina West	SPECIES 1 Macoma nasuta & Nephthys caecoides	NEWFIELDS LABORATORY Port Gamble	PROTOCOL ITM (USEPA/USACE 1989), OTM (USEPA/USACE 1991), ASTM E 1611, SERIM 2008, SOP TOX041
NEWFIELDS JOB NUMBER	PROJECT MANAGER B. Gardiner	WATER DESCRIPTION North Hood Canal; filtered	TEST START DATE 27-Aug-2013	TEST END DATE 24-Sep-2013

WATER QUALITY DATA

CLIENT/NEWFIELDS ID	DAY	REP	JAR #	DO (mg/L)		TEMP (C)		SALINITY		pH		FLOW
				meter	mg/L	meter	°C	meter	ppt	meter	unit	
Comp B /	15	5	3	>5.0		(12-16) ± 1		(25-35) ± 2		7.8 ± 0.5		
Comp B /	16	1	5									
Comp B /	17	2	12									
Comp B /	18	3	1									
Comp B /	19	4	8									
Comp B /	20	5	3									
Comp B /	21	1	5									
Comp B /	22	2	12									
Comp B /	23	3	1									
Comp B /	24	4	8									
Comp B /	25	5	3									
Comp B /	26	1	5									
Comp B /	27	2	12									
		1	5	7	8.2	7	14.4	2	31	S	7.7	
		2	12	7	7.9	1	15.4	31	31		7.8	
		3	1	6.6	6.6	1	15.0	30	30		7.6	
		4	8	7.9	7.9	1	14.6	31	31	↓	7.7	
		5	3	7.6	7.6	4	14.5	30	30	↓	7.7	
Comp B /	28											

Testing Discontinued

9/17/13  
9/10/13



### ORGANISM RECEIPT LOG

Date: 8.19.13		Time: 1130		NewFields Batch No. JG 081913a		
Organism / Project: Macoma nasuta				Invoice Attached Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Source / Supplier: J & B Gunstone				Contact: Reed Gunstone		
No. Ordered: 1450		No. Received: 1450 +		Source Batch: (Collection date, hatch date, etc.): Field		
Condition of Organisms: (Good, fair, poor; describe.): Good			Approximate Size or Age: (Days from hatch, life stage, size class, etc.): Adult			
Shipper: NF Courier			B of L (Tracking No.) NA			
Condition of Container: (Good, fair, poor; describe.): Good			Received By: BM			
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	Number Dead or Moribund	Technician (Initials)
<hr/>		13.8°	<hr/>			BM
Notes:						



## **Appendix E**

### ***Balboa Marina West Sediment Evaluation***

#### **Tissue Chemistry**





**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

November 20, 2013

Bill Gardiner  
Newfields Northwest  
4729 NE View Drive  
Port Gamble, WA 98364

**RE: Client Project: Balboa Marina West**  
**ARI Job Nos.: XN60 & XN61**

Dear Bill:

Please find enclosed the Chain-of-Custody records (COCs), sample receipt documentation, and the final data package for samples from the project referenced above.

Sample receipt and analytical details are discussed in the Case Narrative.

An electronic copy of this data and associated raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

A handwritten signature in black ink, appearing to read "Cheronne Oreiro".

Cheronne Oreiro  
Project Manager  
(206) 695-6214  
[cheronneo@arilabs.com](mailto:cheronneo@arilabs.com)  
[www.ariblas.com](http://www.ariblas.com)

cc: eFile XN60\_XN61

Enclosures

## Chain of Custody Documentation

ARI Job ID: XN60, XN61





# Cooler Receipt Form

ARI Client: Newfields  
COC No(s) 13104, 13105 NA  
Assigned ARI Job No. XN60

Project Name: Balboa Marina West  
Delivered by Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_  
Tracking No. 797126612678 NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler?  YES  NO  
 Were custody papers included with the cooler?  YES  NO  
 Were custody papers properly filled out (ink, signed, etc.)  YES  NO  
 Temperature of Cooler(s) (°C) (recommended 2 0-6 0 °C for chemistry)  
 Time: 1030 4.1  
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID# 90877953

Cooler Accepted by: AV Date: 11/12/13 Time: 1030

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler?  YES  NO  
 What kind of packing material was used? ...  Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper  Other Box  
 Was sufficient ice used (if appropriate)?  YES  NO  
 Were all bottles sealed in individual plastic bags?  YES  NO  
 Did all bottles arrive in good condition (unbroken)?  YES  NO  
 Were all bottle labels complete and legible?  YES  NO  
 Did the number of containers listed on COC match with the number of containers received?  YES  NO  
 Did all bottle labels and tags agree with custody papers?  YES  NO  
 Were all bottles used correct for the requested analyses?  YES  NO  
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)  NA  YES  NO  
 Were all VOC vials free of air bubbles?  NA  YES  NO  
 Was sufficient amount of sample sent in each bottle?  YES  NO  
 Date VOC Trip Blank was made at ARI  NA  
 Was Sample Split by ARI:  NA YES Date/Time \_\_\_\_\_ Equipment \_\_\_\_\_ Split by: \_\_\_\_\_

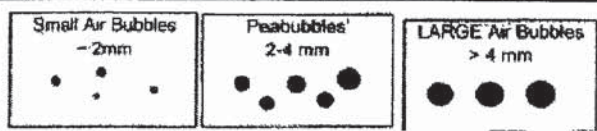
Samples Logged by: AV Date: 11/12/13 Time: 1203

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



Small → "sm" (< 2 mm)  
 Peabubbles → "pb" (2 to < 4 mm)  
 Large → "lg" (4 to < 6 mm)  
 Headspace → "hs" (> 6 mm)



XN601 NewFields Northwest, LLC.  
 Shipping: 4729 NE View Dr.  
 Mailing: P.O. Box 216  
 Port Gamble, WA. 98364  
 Tel: (360) 297-6040, Fax: (360)297-7268

**CHAIN OF CUSTODY**  
**13105**

Destination Lab: <b>ARI</b>		Sample Originator: <b>NewFields</b>		Report Results To:	
Destination Contact: <b>Sue Durnihoo</b>		Contact Name: <b>Bill Gardiner</b>		Contact Name	
Date: <b>11/11/13</b>		Address: <b>See Page 7</b>		Address	
Turn-Around-Time: <b>NA</b>		Phone: <b>See Page 7</b>		Phone	
Project Name: <b>Balboa Marina West</b>		Fax: <b>See Page 7</b>		Fax	
Contract/PO: <b>NA</b>		E-mail: <b>See Page 7</b>		E-mail	
Invoicing To: <b>NewFields</b>		Analysis:		Invoicing To: <b>NewFields</b>	
Comments or Special Instructions: <b>N.C. = Niphthys caecoides</b>				Comments or Special Instructions: <b>N.C. = Niphthys caecoides</b>	
Preservation: <b>Frozen</b>		Sample Temp Upon Receipt:		Preservation	
LAB ID:				LAB ID	

No.	Sample ID	Matrix	No. & Type of Container	Date & Time
1	N.C. Camp. A Ep. 4	TS	1 glass	9/25/13, 11/00
2	↓	↓	↓	↓
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Relinquished by:		Received by:	
Print Name: <b>Mary Bacon</b>	Print Name: <b>A. Volgardsen</b>	Matrix Codes:	
Signature: <b>M. Bacon</b>	Signature: <b>[Signature]</b>	FW = Fresh Water	
Affiliation: <b>NewFields</b>	Affiliation: <b>ARI</b>	WW = Waste Water	
Date/Time: <b>11/11/13 1100</b>	Date/Time: <b>11/12/13 1030</b>	SB = Salt & Brackish Water	
		SS = Soil & Sediment	
		TS = Plant & Animal Tissue	
		OT = Other	



# Cooler Receipt Form

ARI Client: Newfields

Project Name: Balboa Marina West

COC No(s): 13104, 13105 NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: XN61

Tracking No: 7971 266121078 NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler?  YES  NO  
 Were custody papers included with the cooler?  YES  NO  
 Were custody papers properly filled out (ink, signed, etc)  YES  NO  
 Temperature of Cooler(s) (°C) (recommended 2 0-6.0 °C for chemistry)  
 Time: 1030 4.1  
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877453

Cooler Accepted by: AV Date 11/12/13 Time: 1030

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler?  YES  NO  
 What kind of packing material was used?  Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper  Other: Box  
 Was sufficient ice used (if appropriate)?  YES  NO  
 Were all bottles sealed in individual plastic bags?  YES  NO  
 Did all bottles arrive in good condition (unbroken)?  YES  NO  
 Were all bottle labels complete and legible?  YES  NO  
 Did the number of containers listed on COC match with the number of containers received?  YES  NO  
 Did all bottle labels and tags agree with custody papers?  YES  NO  
 Were all bottles used correct for the requested analyses?  YES  NO  
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)  NA  YES  NO  
 Were all VOC vials free of air bubbles?  NA  YES  NO  
 Was sufficient amount of sample sent in each bottle?  YES  NO  
 Date VOC Trip Blank was made at ARI  NA  
 Was Sample Split by ARI  NA  YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

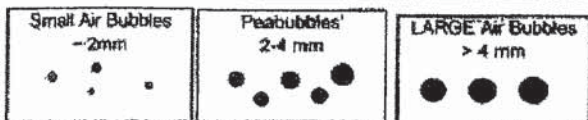
Samples Logged by: AV Date: 11/12/13 Time 1203

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



Small → "sm" (< 2 mm)  
 Peabubbles → "pb" (2 to < 4 mm)  
 Large → "lg" (4 to < 6 mm)  
 Headspace → "hs" (> 6 mm)



Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: XN60, XN61



## Case Narrative

**Client: Newfields**

**Project: Balboa Marina West**

**ARI Job Nos.: XN60 & XN61**

### Sample Receipt

Twenty-two tissue samples were received on November 12, 2013 under ARI jobs XN60 and XN61. The cooler temperature measured by IR thermometer following ARI SOP was 4.1°C. Per client COC, samples were previously stored frozen. For further details regarding sample receipt, please refer to the Cooler Receipt Form.

### Mercury by SW7471A

The samples and associated matrix QC were analyzed outside the method recommended holding time for mercury.

The method blanks were clean at the reporting limits. The LCS percent recoveries were within control limits.

The matrix spike percent recoveries and duplicate RPDs were within control limits.

# Sample ID Cross Reference Report



ARI Job No: XN60  
Client: Newfields Northwest  
Project Event: N/A  
Project Name: Balboa Marina West

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. M.N. PRE-TEST	XN60A	13-24810	Tissue	08/28/13 16:40	11/12/13 10:30
2. M.N. LA.3 REF. REP.1	XN60B	13-24811	Tissue	09/25/13 12:00	11/12/13 10:30
3. M.N. LA.3 REF. REP.2	XN60C	13-24812	Tissue	09/25/13 12:00	11/12/13 10:30
4. M.N. LA.3 REF. REP.3	XN60D	13-24813	Tissue	09/25/13 12:00	11/12/13 10:30
5. M.N. LA.3 REF. REP.4	XN60E	13-24814	Tissue	09/25/13 12:00	11/12/13 10:30
6. M.N. LA.3 REF. REP.5	XN60F	13-24815	Tissue	09/25/13 12:00	11/12/13 10:30
7. M.N. COMP.A REP.1	XN60G	13-24816	Tissue	09/25/13 12:00	11/12/13 10:30
8. M.N. COMP.A REP.2	XN60H	13-24817	Tissue	09/25/13 12:00	11/12/13 10:30
9. M.N. COMP.A REP.3	XN60I	13-24818	Tissue	09/25/13 12:00	11/12/13 10:30
10. M.N. COMP.A REP.4	XN60J	13-24819	Tissue	09/25/13 12:00	11/12/13 10:30
11. M.N. COMP.A REP.5	XN60K	13-24820	Tissue	09/25/13 12:00	11/12/13 10:30
12. N.C. PRE-TEST	XN60L	13-24821	Tissue	08/27/13 17:05	11/12/13 10:30
13. N.C. LA.3 REF. REP.1	XN60M	13-24822	Tissue	09/25/13 11:00	11/12/13 10:30
14. N.C. LA.3 REF. REP.2	XN60N	13-24823	Tissue	09/25/13 11:00	11/12/13 10:30
15. N.C. LA.3 REF. REP.3	XN60O	13-24824	Tissue	09/25/13 11:00	11/12/13 10:30
16. N.C. LA.3 REF. REP.4	XN60P	13-24825	Tissue	09/25/13 11:00	11/12/13 10:30
17. N.C. LA.3 REF. REP.5	XN60Q	13-24826	Tissue	09/25/13 11:00	11/12/13 10:30
18. N.C. COMP.A REP.1	XN60R	13-24827	Tissue	09/25/13 11:00	11/12/13 10:30
19. N.C. COMP.A REP.2	XN60S	13-24828	Tissue	09/25/13 11:00	11/12/13 10:30
20. N.C. COMP.A REP.3	XN60T	13-24829	Tissue	09/25/13 11:00	11/12/13 10:30

# Sample ID Cross Reference Report



ARI Job No: XN61  
Client: Newfields Northwest  
Project Event: N/A  
Project Name: Balboa Marina West

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. N.C. COMP.A REP.4	XN61A	13-24830	Tissue	09/25/13 11:00	11/12/13 10:30
2. N.C. COMP.A REP.5	XN61B	13-24831	Tissue	09/25/13 11:00	11/12/13 10:30



Quality Control Parameters for Mercury Analysis using CVAA EPA Methods 7470A or 245.1 for Aqueous Samples EPA Methods 7471B or 245.5 for Solid Samples						
	Aqueous Samples <sup>2</sup>			Spike Recovery		RPD <sup>5</sup>
	DL <sup>1</sup> µg/L	LOD <sup>1</sup> µg/L	LOQ <sup>1</sup> µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	0.10 <sup>2</sup>	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	0.02 <sup>2</sup>	75 – 125	80 – 120	≤ 20
	Soil / Sediment Samples			Spike Recovery		RPD <sup>5</sup>
	DL <sup>1</sup> mg/kg	LOD <sup>1</sup> mg/kg	LOQ <sup>1</sup> mg/kg	Matrix Spike	LCS	
Mercury	0.0021	0.0125	0.025 <sup>3</sup>	75 – 125	80 – 120	≤ 20
	Tissue Samples			Spike Recovery		RPD <sup>5</sup>
	DL <sup>1</sup> mg/kg	LOD <sup>1</sup> mg/kg	LOQ <sup>1</sup> mg/kg	Matrix Spike	LCS	
Mercury	0.0004	0.0025	0.005 <sup>4</sup>	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S

(2) 20 mL sample with 20 mL final volume

(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.

(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.

(5) Relative Percent Difference between analytes in replicate analyzes. If C<sub>O</sub> and C<sub>D</sub> are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$

Metals Analysis  
Report and Summary QC Forms

ARI Job ID: XN60, XN61

# Cover Page

INORGANIC ANALYSIS DATA PACKAGE



CLIENT: Newfields Northwest

PROJECT: Balboa Marina West

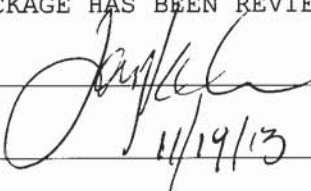
SDG: XN60

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
M.N. PRE-TEST	XN60A	13-24810	
M.N. PRE-TESTD	XN60ADUP	13-24810	
M.N. PRE-TESTS	XN60ASPK	13-24810	
M.N. LA.3 REF. REP	XN60B	13-24811	
PBS	XN60MB1	13-24811	
LCSS	XN60MB1SPK	13-24811	
M.N. LA.3 REF. REP	XN60C	13-24812	
M.N. LA.3 REF. REP	XN60D	13-24813	
M.N. LA.3 REF. REP	XN60E	13-24814	
M.N. LA.3 REF. REP	XN60F	13-24815	
M.N. COMP.A REP.1	XN60G	13-24816	
M.N. COMP.A REP.2	XN60H	13-24817	
M.N. COMP.A REP.3	XN60I	13-24818	
M.N. COMP.A REP.4	XN60J	13-24819	
M.N. COMP.A REP.5	XN60K	13-24820	
N.C. PRE-TEST	XN60L	13-24821	
N.C. LA.3 REF. REP	XN60M	13-24822	
N.C. LA.3 REF. REP	XN60N	13-24823	
N.C. LA.3 REF. REP	XN60O	13-24824	
N.C. LA.3 REF. REP	XN60P	13-24825	
N.C. LA.3 REF. REP	XN60Q	13-24826	

Were ICP interelement corrections applied ?                      Yes/No    YES  
Were ICP background corrections applied ?                      Yes/No    YES  
If yes - were raw data generated before  
application of background corrections ?                      Yes/No    NO

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature:                       Name: Jay Kuhn  
Date: 11/19/13                      Title: Inorganics Director

# Cover Page

INORGANIC ANALYSIS DATA PACKAGE



CLIENT: Newfields Northwest

PROJECT: Balboa Marina West

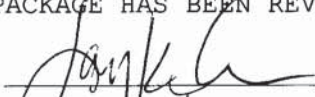
SDG: XN60

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
N.C. COMP.A REP.1	XN60R	13-24827	
N.C. COMP.A REP.2	XN60S	13-24828	
N.C. COMP.A REP.3	XN60T	13-24829	

Were ICP interelement corrections applied ?                      Yes/No    YES  
Were ICP background corrections applied ?                      Yes/No    YES  
If yes - were raw data generated before  
application of background corrections ?                      Yes/No    NO

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature:                       Name: Jay Kuhn  
Date: 11/19/13                      Title: Inorganics Director



**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: M.N. PRE-TEST  
SAMPLE**

Lab Sample ID: XN60A

LIMS ID: 13-24810

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 08/28/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.007

U-Analyte undetected at given LOQ


LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: M.N. LA.3 REF. REP.1  
SAMPLE**

Lab Sample ID: XN60B  
LIMS ID: 13-24811  
Matrix: Tissue  
Data Release Authorized:   
Reported: 11/19/13

QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.010


U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: M.N. LA.3 REF. REP.2  
SAMPLE**

Lab Sample ID: XN60C  
LIMS ID: 13-24812  
Matrix: Tissue  
Data Release Authorized   
Reported: 11/19/13

QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.008

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: M.N. LA.3 REF. REP.3  
SAMPLE**

Lab Sample ID: XN60D

LIMS ID: 13-24813

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.008


U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: M.N. LA.3 REF. REP.4  
SAMPLE**

Lab Sample ID: XN60E  
LIMS ID: 13-24814  
Matrix: Tissue  
Data Release Authorized:   
Reported: 11/19/13

QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.010

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: M.N. LA.3 REF. REP.5  
SAMPLE**

Lab Sample ID: XN60F

LIMS ID: 13-24815

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.009

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: M.N. COMP.A REP.1  
SAMPLE

Lab Sample ID: XN60G

LIMS ID: 13-24816

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.010


U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: M.N. COMP.A REP.2  
SAMPLE

Lab Sample ID: XN60H  
LIMS ID: 13-24817  
Matrix: Tissue  
Data Release Authorized:   
Reported: 11/19/13

QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.013

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation



**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: M.N. COMP.A REP.3  
SAMPLE**

Lab Sample ID: XN60I

LIMS ID: 13-24818

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.012

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: M.N. COMP.A REP.4  
SAMPLE**

Lab Sample ID: XN60J  
LIMS ID: 13-24819  
Matrix: Tissue  
Data Release Authorized:  
Reported: 11/19/13



QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.012

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: M.N. COMP.A REP.5  
SAMPLE**

Lab Sample ID: XN60K  
LIMS ID: 13-24820  
Matrix: Tissue  
Data Release Authorized  
Reported: 11/19/13



QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.013

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: N.C. PRE-TEST  
SAMPLE**

Lab Sample ID: XN60L

LIMS ID: 13-24821

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 08/27/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.009

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: N.C. LA.3 REF. REP.1  
SAMPLE**

Lab Sample ID: XN60M

LIMS ID: 13-24822

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

<b>Prep Meth</b>	<b>Prep Date</b>	<b>Analysis Method</b>	<b>Analysis Date</b>	<b>CAS Number</b>	<b>Analyte</b>	<b>LOQ</b>	<b>mg/kg-as-rec Q</b>
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.008

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: N.C. LA.3 REF. REP.2  
SAMPLE

Lab Sample ID: XN60N

LIMS ID: 13-24823

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.008

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: N.C. LA.3 REF. REP.3  
SAMPLE**

Lab Sample ID: XN600

LIMS ID: 13-24824

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.009

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: N.C. LA.3 REF. REP.4  
SAMPLE**

Lab Sample ID: XN60P

LIMS ID: 13-24825

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.008

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation



**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: N.C. LA.3 REF. REP.5  
SAMPLE**

Lab Sample ID: XN60Q  
LIMS ID: 13-24826  
Matrix: Tissue  
Data Release Authorized  
Reported: 11/19/13



QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.009

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: N.C. COMP.A REP.1  
SAMPLE**

Lab Sample ID: XN60R

LIMS ID: 13-24827

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.008


U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: N.C. COMP.A REP.2  
SAMPLE**

Lab Sample ID: XN60S  
LIMS ID: 13-24828  
Matrix: Tissue  
Data Release Authorized:   
Reported: 11/19/13

QC Report No: XN60-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.009

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: N.C. COMP.A REP.3  
SAMPLE**

Lab Sample ID: XN60T

LIMS ID: 13-24829

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.008

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: M.N. PRE-TEST  
MATRIX SPIKE**

Lab Sample ID: XN60A

LIMS ID: 13-24810

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 08/28/13

Date Received: 11/12/13

**MATRIX SPIKE QUALITY CONTROL REPORT**

<b>Analyte</b>	<b>Analysis Method</b>	<b>Sample</b>	<b>Spike</b>	<b>Spike Added</b>	<b>% Recovery</b>	<b>Q</b>
Mercury	7471A	0.007	0.052	0.0489	92.0%	

Reported in mg/kg-as-rec

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: M.N. PRE-TEST  
DUPLICATE**

Lab Sample ID: XN60A

LIMS ID: 13-24810

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 08/28/13

Date Received: 11/12/13

**MATRIX DUPLICATE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7471A	0.007	0.007	0.0%	+/- 0.005	L

Reported in mg/kg-as-rec

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: LAB CONTROL**

Lab Sample ID: XN60LCS

LIMS ID: 13-24811

Matrix: Tissue

Data Release Authorized:

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

<b>Analyte</b>	<b>Analysis Method</b>	<b>Spike Found</b>	<b>Spike Added</b>	<b>% Recovery</b>	<b>Q</b>
Mercury	7471A	0.114	0.100	114%	

Reported in mg/kg-wet

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


**Sample ID: METHOD BLANK**

Page 1 of 1

Lab Sample ID: XN60MB

LIMS ID: 13-24811

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN60-Newfields Northwest

Project: Balboa Marina West

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.005 U

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation





# Calibration Verification

CLIENT: Newfields Northwest

PROJECT: Balboa Marina West

SDG: XN60

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVA	HG111802	8.0	8.06	100.8	4.0	4.08	102.0	4.18	104.5	4.25	106.3	4.28	107.0	4.30	107.5

Control Limits: Mercury 80-120; Other Metals 90-110



**CRDL Standard**

CLIENT: Newfields Northwest  
PROJECT: Balboa Marina West  
SDG: XN60

UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
---------	----	---	-----	-------	----	------	----	------	----	------	----	------	----	------	----	------	----

Mercury	HG	CVA	HG11802	0.1		0.11	110.0										
---------	----	-----	---------	-----	--	------	-------	--	--	--	--	--	--	--	--	--	--

XN60 : 00040

Control Limits: no control limits have been established by the EPA at this time.

# Calibration Blanks



CLIENT: Newfields Northwest

PROJECT: Balboa Marina West

SDG: XN60

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVA	HG111802	0.2	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

XN60 : 00041

# IDLs and ICP Linear Ranges



CLIENT: Newfields Northwest

PROJECT: Balboa Marina West

SDG: XN60

UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENGTH (nm)	GFA	CLP	RL	RL	ICP LINEAR	ICP LR
					BACK- GROUND					
Mercury	HG	CVA	CETAC MERCURY	253.70		0.2	0.1	4/1/2012		

# Preparation Log



CLIENT: Newfields Northwest

ANALYSIS METHOD: CVA

PROJECT: Balboa Marina West

ARI PREP CODE: FRM

SDG: XN60

PREPDATE: 11/15/2013

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
M.N. PRE-TEST	XN60A	1.020	0.0	50.0
M.N. PRE-TESTD	XN60ADUP	1.018	0.0	50.0
M.N. PRE-TESTS	XN60ASPK	1.023	0.0	50.0
M.N. LA.3 REF. REP	XN60B	1.023	0.0	50.0
M.N. LA.3 REF. REP	XN60C	1.094	0.0	50.0
M.N. LA.3 REF. REP	XN60D	1.033	0.0	50.0
M.N. LA.3 REF. REP	XN60E	1.036	0.0	50.0
M.N. LA.3 REF. REP	XN60F	1.040	0.0	50.0
M.N. COMP.A REP.1	XN60G	1.069	0.0	50.0
M.N. COMP.A REP.2	XN60H	1.042	0.0	50.0
M.N. COMP.A REP.3	XN60I	1.081	0.0	50.0
M.N. COMP.A REP.4	XN60J	1.036	0.0	50.0
M.N. COMP.A REP.5	XN60K	1.025	0.0	50.0
N.C. PRE-TEST	XN60L	1.037	0.0	50.0
N.C. LA.3 REF. REP	XN60M	1.040	0.0	50.0
PBS	XN60MB1	1.000	0.0	50.0
LCSW	XN60MB1SPK	1.000	0.0	50.0
N.C. LA.3 REF. REP	XN60N	1.025	0.0	50.0
N.C. LA.3 REF. REP	XN60O	1.058	0.0	50.0
N.C. LA.3 REF. REP	XN60P	1.016	0.0	50.0
N.C. LA.3 REF. REP	XN60Q	1.075	0.0	50.0
N.C. COMP.A REP.1	XN60R	1.070	0.0	50.0
N.C. COMP.A REP.2	XN60S	1.057	0.0	50.0
N.C. COMP.A REP.3	XN60T	1.083	0.0	50.0





# Cover Page

INORGANIC ANALYSIS DATA PACKAGE



CLIENT: Newfields Northwest

PROJECT: Balboa Marina West

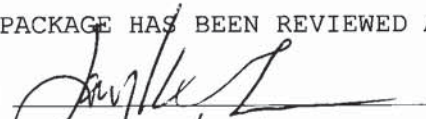
SDG: XN61

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
N.C. COMP.A REP.4	XN61A	13-24830	
N.C. COMP.A REP.4D	XN61ADUP	13-24830	
N.C. COMP.A REP.4S	XN61ASPK	13-24830	
N.C. COMP.A REP.5	XN61B	13-24831	
PBS	XN61MB1	13-24831	
LCSS	XN61MB1SPK	13-24831	

Were ICP interelement corrections applied ?                      Yes/No    YES  
Were ICP background corrections applied ?                      Yes/No    YES  
If yes - were raw data generated before  
application of background corrections ?                      Yes/No    NO

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature:                       Name: Jay Kuhn  
Date: 11/19/13                      Title: Inorganics Director



**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: N.C. COMP.A REP.4  
SAMPLE

Lab Sample ID: XN61A

LIMS ID: 13-24830

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN61-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.009


U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: N.C. COMP.A REP.5  
SAMPLE**

Lab Sample ID: XN61B  
LIMS ID: 13-24831  
Matrix: Tissue  
Data Release Authorized:   
Reported: 11/19/13

QC Report No: XN61-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.009


U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

**Sample ID: N.C. COMP.A REP.4  
MATRIX SPIKE**

Lab Sample ID: XN61A  
LIMS ID: 13-24830  
Matrix: Tissue  
Data Release Authorized:   
Reported: 11/19/13

QC Report No: XN61-Newfields Northwest  
Project: Balboa Marina West

Date Sampled: 09/25/13  
Date Received: 11/12/13

**MATRIX SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7471A	0.009	0.055	0.0470	97.9%	

Reported in mg/kg-as-rec

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: N.C. COMP.A REP.4  
DUPLICATE**

Lab Sample ID: XN61A

LIMS ID: 13-24830

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN61-Newfields Northwest

Project: Balboa Marina West

Date Sampled: 09/25/13

Date Received: 11/12/13

**MATRIX DUPLICATE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7471A	0.009	0.009	0.0%	+/- 0.005	L

Reported in mg/kg-as-rec

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

**Sample ID: LAB CONTROL**

Lab Sample ID: XN61LCS

LIMS ID: 13-24831

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN61-Newfields Northwest

Project: Balboa Marina West

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

<b>Analyte</b>	<b>Analysis Method</b>	<b>Spike Found</b>	<b>Spike Added</b>	<b>% Recovery</b>	<b>Q</b>
Mercury	7471A	0.110	0.100	110%	

Reported in mg/kg-wet

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: XN61MB

LIMS ID: 13-24831

Matrix: Tissue

Data Release Authorized: 

Reported: 11/19/13

QC Report No: XN61-Newfields Northwest

Project: Balboa Marina West

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-as-rec Q	
CLP-M	11/15/13	7471A	11/18/13	7439-97-6	Mercury	0.005	0.005	U

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation



# Calibration Verification

CLIENT: Newfields Northwest  
PROJECT: Balboa Marina West  
SDG: XN61

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVA	HG111802	8.0	8.06	100.8	4.0	4.08	102.0	4.18	104.5						

Control Limits: Mercury 80-120; Other Metals 90-110

XN61 : 00050



**CRDL Standard**

CLIENT: Newfields Northwest  
 PROJECT: Balboa Marina West  
 SDG: XN61

UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Mercury	HG	CVA	HG111802	0.1		0.11	110.0										

Control Limits: no control limits have been established by the EPA at this time.



# Calibration Blanks



CLIENT: Newfields Northwest

PROJECT: Balboa Marina West

SDG: XN61

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVA	HG111802	0.2	0.1	0.1	U	0.1	U	0.1	U						

XN60 : 00055

# IDLs and ICP Linear Ranges



CLIENT: Newfields Northwest  
PROJECT: Balboa Marina West  
SDG: XN61

UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENGTH (nm)	GFA BACK- GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Mercury	HG	CVA	CETAC MERCURY	253.70		0.2	0.1	4/1/2012		

# Preparation Log



CLIENT: Newfields Northwest

ANALYSIS METHOD: CVA

PROJECT: Balboa Marina West

ARI PREP CODE: FRM

SDG: XN61

PREPDATE: 11/15/2013

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
N.C. COMP.A REP.4	XN61A	1.069	0.0	50.0
N.C. COMP.A REP.4D	XN61ADUP	1.074	0.0	50.0
N.C. COMP.A REP.4S	XN61ASPK	1.064	0.0	50.0
N.C. COMP.A REP.5	XN61B	1.049	0.0	50.0
PBS	XN61MB1	1.000	0.0	50.0
LCSW	XN61MB1SPK	1.000	0.0	50.0



# Analysis Run Log

CLIENT: Newfields Northwest  
 PROJECT: Balboa Marina West  
 SDG: XN61  
 INSTRUMENT ID: CETAC MERCURY  
 RUNID: HG111802  
 METHOD: CVA  
 START DATE: 11/18/2013  
 END DATE: 11/18/2013

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN		
S0	S0		1.00 10404														X																		
S0.1	S0.1		1.00 10422														X																		
S0.5	S0.5		1.00 10440														X																		
S1	S1		1.00 10453														X																		
S2	S2		1.00 10471														X																		
S5	S5		1.00 10485														X																		
S10	S10		1.00 10503														X																		
ICV	AICV		1.00 10532														X																		
ICB	ICB		1.00 10545														X																		
CCV	ACCV1		1.00 10563														X																		
CCB	CCB1		1.00 10581														X																		
CRA	CRA		1.00 10595														X																		
PBW	XN61MB1		1.00 11012														X																		
LCSW	XN61MB1SPK		1.00 11030														X																		
N.C. COMP.A REP.4	XN61A		1.00 11043														X																		
N.C. COMP.A REP.4D	XN61ADUP		1.00 11061														X																		
N.C. COMP.A REP.4S	XN61ASPK		1.00 11075														X																		
N.C. COMP.A REP.5	XN61B		1.00 11092														X																		
ZZZZZZ	XN60MB1		1.00 11110																																
ZZZZZZ	XN60MB1SPK		1.00 11124																																
ZZZZZZ	XN60A		1.00 11142																																
CCV	ACCV2		1.00 11160																																X
CCB	CCB2		1.00 11174																																X

XN61 00050

**Metals Raw Data  
Preparation Bench Sheets and Notes**

**ARI Job ID: XN60, XN61**















# Mercury Digestion Log

Prep Code: FRM

Matrix: Tissue

Analyst: DM

Date: 11-15-13

Bath Temp: 60°

Start Time: 0655

End Time: 0925

ARI Sample ID	Sample Bottle #	pH<2	Initial Weight (g) Volume (mL)	Final Volume (mL)	# KMnO <sub>4</sub> Aliquots	CLP	Comments
XN60 A	1	—	1.020	50.0	1123 1	Ⓢ	
" ADUP	1	—	1.018		1		
" ADPK	1	—	1.023		1		
" B	1	—	1.023		1		
" C	1	—	1.094		1		
" D	1	—	1.033		1		
" E	1	—	1.036		1		
" F	1	—	1.040		1		
" G	1	—	1.069		1		
" H	1	—	1.042		1		
" I	1	—	1.081		1		
" J	1	—	1.036		1		
" K	1	—	1.025		1		
" L	1	—	1.057		1		
" M	1	—	1.040		1		
" N	1	—	1.025		1		
" O	1	—	1.056		1		
" P	1	—	1.06		1		
" Q	1	—	1.075		1		
" R	1	—	1.070		1		
" S	1	—	1.057		1		
" T	1	—	1.083		1		
" MB1	—	—	—	↓	1	↓	
" MBSPK	—	—	—	50.0	1	Ⓢ	
			11-15-13	DM			

Chemical/Reagent ID:

HNO<sub>3</sub>: B1445  
5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: B2317

H<sub>2</sub>SO<sub>4</sub>: B1491  
5% KMnO<sub>4</sub>: MP2552

HCl: —  
Digest Tube Lot: 1303205



# Mercury Digestion Log

Prep Code: FRM

Matrix: Tissue

Analyst: DM

Date: 11-15-13

Bath Temp: 60°C

Start Time: 0855

End Time: 0925

ARI Sample ID	Sample Bottle #	pH<2	Initial Weight (g) Volume (mL)	Final Volume (mL)	# KMnO <sub>4</sub> Aliquots	CLP	Comments
XNGL A	1	—	1.069	50.0	11/23 1	Ⓜ	
" ADUP	1	—	1.074	↓	1	↓	
" ASDL	1	—	1.064	↓	1	↓	
" DM 11-15-13 ATB	1	—	1.049	↓	1	↓	
" MB1	—	—	—	↓	1	↓	
" MBDFK	—	—	—	50.0	1	Ⓜ	
11-15-13 DM							

Chemical/Reagent ID:

HNO<sub>3</sub>: B1445

H<sub>2</sub>SO<sub>4</sub>: B1491

HCl: —

5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: B2317

5% KMnO<sub>4</sub>: MP2552

Digest Tube Lot: 1303205

**Metals Raw Data  
Run Logs, Calibrations, and Raw Data**

**ARI Job ID: XN60, XN61**

**Metals Data Review Checklist**

Method: ICP ICP-MS GFA CVA

Analysis Date: 11-18-13

	Analyst 11-18-13 OM	Peer 11-18-13	Comment
Analyst, Date, Method info	✓	/	
Sample ID's	✓	/	
Standard/QC solution ID's recorded	✓	/	
Prep codes	✓	/	
Dilution factors	✓	/	
Crossouts/Corrections/Deletions	✓	/	
Blank & Standard intensities	✓	/	
Standard deviations	✓	/	
Curve fit	✓	/	
ICV/CCV	✓	/	
ICB/CCB	✓	/	
RSD's & SD's	✓	/	
Internal Standards	-	-	
Carry-over	-	-	
CRI/CRA	✓	/	
ICSA/ICSAB	-	-	
Post Spikes/Serial Dilutions	-	-	
Analytic Spikes	-	-	
SRM/LCS	✓	/	
Matrix Spikes	✓	/	XN64 DSPK H:7R
Matrix Duplicates	✓	/	XN64 DDUP D:FF70.1
Method Blanks	✓	/	
Requested elements/isotope identified	✓	/	
Correct samples identified for distribution	✓	/	
Raw data match distributed data	✓	/	
Data filename correct	✓	/	
	✓	/	SEE CVA

### Mercury Analysis Log

Analyst: DM  
 Instrument: CETAZ

Date: 11-18-13  
 Page: 2 of 5

ARI Sample ID	Prep Code	Dilution	QC Data (ppb)	Comments
XNL4 A	SMM	1X		
CCV			4.24	%R=106 ✓
CCB			-0.02	✓
XNL4 B				
" C				
" D			0.63	
" DDUP			0.49	Diff 70.1 X
" DDPK			1.94	%R=131 High X
" F				
" G				
" H				
CCV			4.28	%R=107 ✓
CCB			-0.02	✓
XNL4 D			0.62	
" DDUP			0.48	Diff 70.1 X
" DDPK			1.98	%R=136 High X
CCV			4.20	%R=105 ✓
CCB			-0.01	✓
STD 0.0	FRM			
" 0.1				
" 0.5				
" 1.0				
" 2.0				
" 5.0				
" 10.0				
ICV			8.06	Begin CLP %R=101 ✓
ICB			-0.02	✓
CCV1			4.05	%R=102 ✓
CCB1			-0.00	✓
CRA			0.11	✓

Chemical/Reagent ID:  
 10% SnCl<sub>2</sub>: B2382

14% NH<sub>2</sub>OH/NaCl: MP2558

Standard ID:  
 Standard: 3043-1 (SMM)  
3043-3 (FRM)

ICV/CCV: 59-6

### Mercury Analysis Log

Analyst: DM  
 Instrument: CETAC

Date: 11-18-13  
 Page: 3 of 5

ARI Sample ID	Prep Code	Dilution	QC Data (ppb)	Comments
XN61 MBI	FRM	1X	-0.00	✓
" MB15PK			2.19	%R=110 ✓
" A			0.19	
" ADUP			0.20	✓
" FSPK			1.17	%R=98 ✓
" B				
XN60 MBI			0.01	✓
" MB15PK			2.29	%R=115 ✓
" A			0.14	
CCV2			4.18	%R=105 ✓
CCB2			-0.01	✓
XN60 ADUP			0.14	✓
" FSPK			1.07	%R=93 ✓
" B				
" C				
" D				
" E				
" F				
" G				
" H				
" I				
CCV3			4.25	%R=106 ✓
CCB3			-0.00	✓
XN60 J				
" K				
" L				
" M				
" N				
" O				
" P	↓	↓		

Chemical/Reagent ID:  
 10% SnCl<sub>2</sub>: 82282  
 Standard ID:  
 Standard: 3043-3

14% NH<sub>2</sub>OH/NaCl: MP2598  
 ICV/CCV: 59-6



### Mercury Analysis Log

Analyst: DM  
Instrument: CETAC

Date: 11-18-13  
Page: 4 of 5

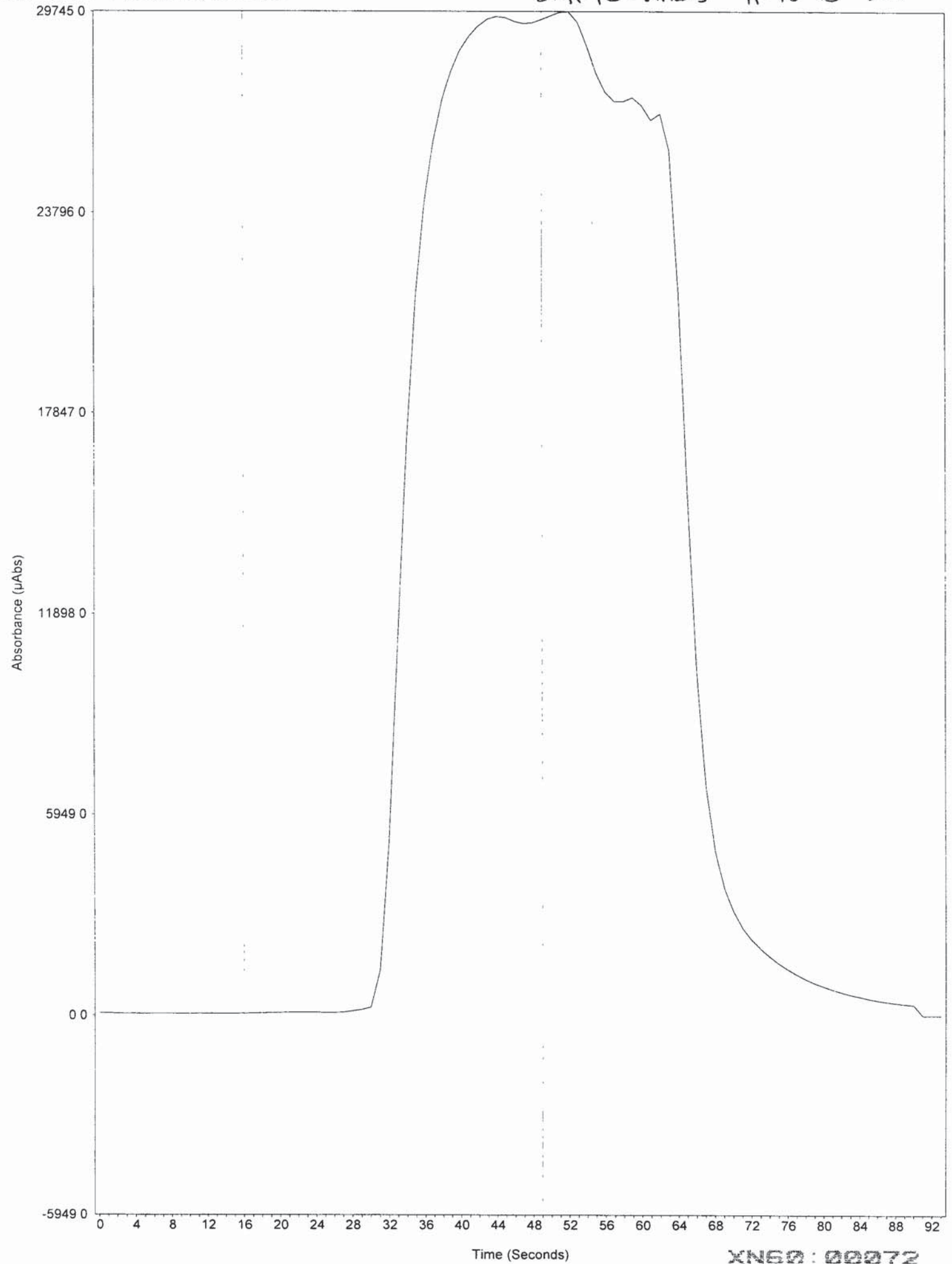
ARI Sample ID	Prep Code	Dilution	QC Data (ppb)	Comments
XN60 Q	FRM	1X		
" R				
" S				
CCV4			4.28	%R=107 ✓
CCB4			-0.00	✓
XN60 T				
CCV5			4.30	%R=108 ✓
CCB5	↓		-0.00	END CLP ✓
<del>STD 0.0</del>	<del>TWM</del>			
<del>" 0.1</del>				
<del>" 0.5</del>				
<del>" 1.0</del>				
<del>" 2.0</del>				
<del>" 5.0</del>				
<del>" 10.0</del>				
ICV			7.77	%R=97 ✓
ICB			-0.03	✓
CCV			1.16	%R=104 ✓
CCB			0.07	✓
CRA	↓			✓
XN80 M82	LEM		-0.00	✓
" AT			-0.00	
" ATDUP			-0.00	NO RPD: Undetected ✓
" ATSPK	↓		1.10	%R=110 ✓
XN71 M82	TWM		-0.00	✓
" M82SPK			2.15	%R=108 ✓
" R			0.95	
" RDUP			0.34	✓
" RSPK			1.37	%R=102 ✓
CCV	↓	↓	4.04	%R=101 ✓

Chemical/Reagent ID:  
10% SnCl<sub>2</sub>: B2362

14% NH<sub>2</sub>OH/NaCl: MP2556

Standard ID:  
Standard: 3043-3 (FRM)  
X 3043-2 (TWM)

ICV/CCV: 59-6

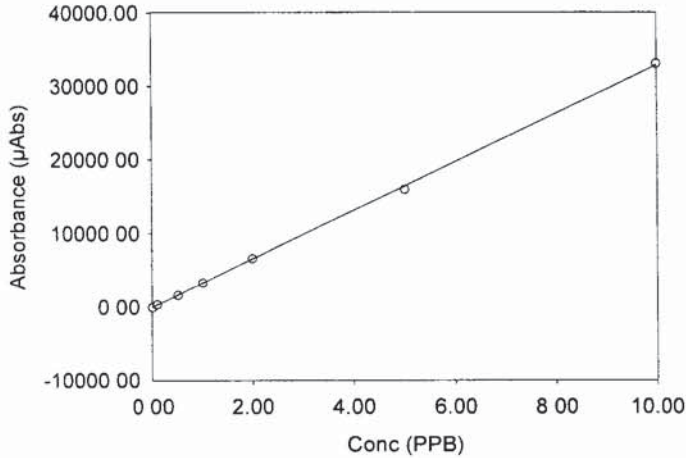


Analyst  
 Date Started Monday, November 18, 2013, 10:40:47  
 Worksheet ARI 10ppb CALIB  
 Comment

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
Calibration Zero	18-Nov-2013, 10:40	0.00	22.60	-37.50	1.00	
Standard #1	18-Nov-2013, 10:42	0.10	2.83	349.00	1.00	
Standard #2	18-Nov-2013, 10:44	0.50	0.24	1600.00	1.00	
Standard #3	18-Nov-2013, 10:45	1.00	0.54	3280.00	1.00	
Standard #4	18-Nov-2013, 10:47	2.00	0.54	6620.00	1.00	
Standard #5	18-Nov-2013, 10:48	5.00	0.39	16000.00	1.00	
Standard #6	18-Nov-2013, 10:50	10.00	0.40	33100.00	1.00	

FRM

Calibration Data



Int. 0.000  
 Slope 3283.329  
 Correlation 0.99985

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
ICV	18-Nov-2013, 10:53	8.06	0.80	26500.00	1.00	
ICB	18-Nov-2013, 10:54	-0.02	1.85	-61.30	1.00	

FRM CLP

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
QC Standard	18-Nov-2013, 10:56	4.08	0.60	13400.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
QC Blank	18-Nov-2013, 10:58	-0.00	33.40	-7.61	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
CRA	18-Nov-2013, 10:59	0.11	0.46	365.00	1.00	
XN61 MB1 FRM	18-Nov-2013, 11:01	-0.00	43.20	-15.50	1.00	
XN61 MB1SPK FRM	18-Nov-2013, 11:03	2.19	0.49	7190.00	1.00	
XN61 A FRM	18-Nov-2013, 11:04	0.19	1.63	635.00	1.00	
XN61 ADUP FRM	18-Nov-2013, 11:06	0.20	0.40	659.00	1.00	
XN61 ASPK FRM	18-Nov-2013, 11:07	1.17	1.40	3840.00	1.00	
XN61 B FRM	18-Nov-2013, 11:09	0.19	0.60	638.00	1.00	
XN60 MB1 FRM	18-Nov-2013, 11:11	0.01	17.20	46.70	1.00	
XN60 MB1SPK FRM	18-Nov-2013, 11:12	2.29	0.46	7530.00	1.00	
XN60 A FRM	18-Nov-2013, 11:14	0.14	1.44	457.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
QC Standard	18-Nov-2013, 11:16	4.18	1.34	13700.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
QC Blank	18-Nov-2013, 11:17	-0.01	7.43	-17.60	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. $\mu$ Abs	Dilution	Flags
XN60 ADUP FRM	18-Nov-2013, 11:19	0.14	0.39	462.00	1.00	
XN60 ASPK FRM	18-Nov-2013, 11:20	1.07	1.13	3520.00	1.00	
XN60 B FRM	18-Nov-2013, 11:22	0.21	0.31	675.00	1.00	
XN60 C FRM	18-Nov-2013, 11:24	0.18	1.98	578.00	1.00	

XN60 : 00073

Analyst  
 Date Started Monday, November 18, 2013, 11:25:42  
 Worksheet ARI 10ppb CALIB  
 Comment

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
XN60 D FRM	18-Nov-2013, 11:25	0.17	1.50	568.00	1.00	
XN60 E FRM	18-Nov-2013, 11:27	0.21	1.87	675.00	1.00	
XN60 F FRM	18-Nov-2013, 11:28	0.18	0.52	590.00	1.00	
XN60 G FRM	18-Nov-2013, 11:30	0.22	0.59	735.00	1.00	
XN60 H FRM	18-Nov-2013, 11:32	0.27	0.65	889.00	1.00	
XN60 I FRM	18-Nov-2013, 11:33	0.27	0.38	899.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
QC Standard	18-Nov-2013, 11:35	4.25	0.78	14000.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
QC Blank	18-Nov-2013, 11:37	-0.00	21.40	-15.20	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
XN60 J FRM	18-Nov-2013, 11:38	0.24	0.95	786.00	1.00	
XN60 K FRM	18-Nov-2013, 11:40	0.27	0.67	881.00	1.00	
XN60 L FRM	18-Nov-2013, 11:42	0.19	1.63	620.00	1.00	
XN60 M FRM	18-Nov-2013, 11:43	0.16	0.32	542.00	1.00	
XN60 N FRM	18-Nov-2013, 11:45	0.17	0.71	573.00	1.00	
XN60 O FRM	18-Nov-2013, 11:46	0.19	1.60	626.00	1.00	
XN60 P FRM	18-Nov-2013, 11:48	0.17	1.11	556.00	1.00	
XN60 Q FRM	18-Nov-2013, 11:50	0.20	0.61	656.00	1.00	
XN60 R FRM	18-Nov-2013, 11:51	0.17	0.97	554.00	1.00	
XN60 S FRM	18-Nov-2013, 11:53	0.20	0.53	644.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
QC Standard	18-Nov-2013, 11:54	4.28	0.92	14100.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
QC Blank	18-Nov-2013, 11:56	-0.00	21.90	-13.70	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
XN60 T FRM	18-Nov-2013, 11:58	0.18	0.59	592.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
QC Standard	18-Nov-2013, 11:59	4.30	0.78	14100.00	1.00	

Sample ID	Analysis Time	Conc (PPB)	%RSD	Avg. µAbs	Dilution	Flags
QC Blank	18-Nov-2013, 12:01	-0.00	45.60	-13.00	1.00	

END CLP

Analyst  
Date Created: Thursday, July 13, 2000  
Worksheet ARI 10ppb CALIB  
Comment

Sip Duration (Sec.): 30  
Rinse Duration (Sec.): 60  
Read Delay: 49  
Integration Time/Replicate: 1.40  
# of Replicates: 4  
# of Repeats: 1  
Baseline Correction Enabled: True  
Baseline Point 1 Start Time: 10  
Baseline Point 1 End Time: 16  
2-Point Baseline Corr. Enabled: False  
Baseline Point 2 Start Time:  
Baseline Point 2 End Time:

Gas Flow (ml/min): 180

Calibration Algorithm: Linear, Zero Intercept  
Recalibration Frequency: 0  
Reslope Frequency: 0  
Reslope Standard: 5  
Calibration Standard #1 Conc.: 0.10 PPB  
Calibration Standard #2 Conc.: 0.50 PPB  
Calibration Standard #3 Conc.: 1.00 PPB  
Calibration Standard #4 Conc.: 2.00 PPB  
Calibration Standard #5 Conc.: 5.00 PPB  
Calibration Standard #6 Conc.: 10.00 PPB

QC Enabled: True  
QC-RSD Enabled: True  
Limit Condition & Error Action: If %RSD > 5 0%, if  $\mu$ Abs. > 1500, Flag and Continue

QC-Std Enabled: True  
Limit Condition & Error Action: If outside 80% . 120%,Stop

QC-Blank Enabled: True  
Limit Condition & Error Action: If outside -100 100,Stop



# Mercury Standard Prep Log

Prep Code: Smn

Instrument: CETAC

Analyst: CB

Date: 11-13-12

Bath Temp: 95°C

Start Time: 0820

End Time: 0850

Standard ID	Stock ID	Volume Added (mL)	Final Volume (mL)	Standard Conc. (µg/L)	Number Made
STD0	-	0.00	50.0	0.0	3
STD1	3043-1	0.01	↓	0.1	2
STD2	↓	0.05		0.5	2
STD3		0.10		1.0	2
STD4		0.20		2.0	2
STD5		0.50		5.0	2
STD6		1.00		10.0	2
CRA		↓		0.01	0.1
ICB/CCB	-	0.00	0.0	3	
ICV/LCS	57-6	0.08	↓	5.0	2
CCV	↓	0.04	50.0	4.0	2

Chemical/Reagent ID:

HNO<sub>3</sub>: B1445      H<sub>2</sub>SO<sub>4</sub>: I9046      HCl: -  
 5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: MP2551      5% KMnO<sub>4</sub>: MP2552

Prep Code: \_\_\_\_\_

Instrument: \_\_\_\_\_

Analyst: \_\_\_\_\_

Date: \_\_\_\_\_

Bath Temp: \_\_\_\_\_

Start Time: \_\_\_\_\_

End Time: \_\_\_\_\_

Standard ID	Stock ID	Volume Added (mL)	Final Volume (mL)	Standard Conc. (µg/L)	Number Made
STD0		0.00			
STD1					
STD2		0.05			
STD3		0.10			
STD4		0.20			
STD5		0.50			
STD6		1.00			
CRA					
ICB/CCB		0.00			
ICV/LCS					
CCV					

Chemical/Reagent ID:

HNO<sub>3</sub>: \_\_\_\_\_      H<sub>2</sub>SO<sub>4</sub>: \_\_\_\_\_      HCl: \_\_\_\_\_  
 5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: \_\_\_\_\_      5% KMnO<sub>4</sub>: \_\_\_\_\_



# Mercury Standard Prep Log

Prep Code: FRM

Instrument: CETA

Analyst: DM

Date: 11-15-13

Bath Temp: 60°C

Start Time: 1045

End Time: 1115

Standard ID	Stock ID	Volume Added (mL)	Final Volume (mL)	Standard Conc. (µg/L)	Number Made
STD0	-	0.00	50.0	0.0	3
STD1	3043.3	0.01		0.1	2
STD2		0.05		0.5	2
STD3		0.10		1.0	2
STD4		0.20		2.0	2
STD5		0.50		5.0	2
STD6		1.00		10.0	2
CRA	↓	0.01		0.1	1
ICB/CCB	-	0.00		0.0	3
ICV/LCS	59.6	0.06	↓	8.0	2
CCV	↓	0.04	50.0	4.0	3

Chemical/Reagent ID:

HNO<sub>3</sub>: B1445

H<sub>2</sub>SO<sub>4</sub>: B1A1

HCl: -

5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: B2317

5% KMnO<sub>4</sub>: M2552

Prep Code: \_\_\_\_\_

Instrument: \_\_\_\_\_

Analyst: \_\_\_\_\_

Date: \_\_\_\_\_

Bath Temp: \_\_\_\_\_

Start Time: \_\_\_\_\_

End Time: \_\_\_\_\_

Standard ID	Stock ID	Volume Added (mL)	Final Volume (mL)	Standard Conc. (µg/L)	Number Made
STD0		0.00			
STD1					
STD2		0.05			
STD3		0.10			
STD4		0.20			
STD5		0.50			
STD6		1.00			
CRA					
ICB/CCB		0.00			
ICV/LCS					
CCV					

Chemical/Reagent ID:

HNO<sub>3</sub>: \_\_\_\_\_

H<sub>2</sub>SO<sub>4</sub>: \_\_\_\_\_

HCl: \_\_\_\_\_

5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: \_\_\_\_\_

5% KMnO<sub>4</sub>: \_\_\_\_\_



# Mercury Digestion Log

Prep Code: FRM  
Analyst: DM  
Bath Temp: 60°

Matrix: Tissue  
Date: 11-15-13  
End Time: 0925

Start Time: 0655

ARI Sample ID	Sample Bottle #	pH<2	Initial Weight (g) Volume (mL)	Final Volume (mL)	# KMnO <sub>4</sub> Aliquots	CLP	Comments
XN60 A	1	-	1.020	50.0	11/23 1	(7)	
" ADUP	1	-	1.018		1		
" ADPK	1	-	1.023		1		
" B	1	-	1.023		1		
" C	1	-	1.094		1		
" D	1	-	1.033		1		
" E	1	-	1.036		1		
" F	1	-	1.040		1		
" G	1	-	1.069		1		
" H	1	-	1.042		1		
" I	1	-	1.061		1		
" J	1	-	1.036		1		
" K	1	-	1.025		1		
" L	1	-	1.037		1		
" M	1	-	1.040		1		
" N	1	-	1.025		1		
" O	1	-	1.056		1		
" P	1	-	1.06		1		
" Q	1	-	1.075		1		
" R	1	-	1.070		1		
" S	1	-	1.057		1		
" T	1	-	1.063		1		
" MB1	-	-	-	↓	1	↓	
" MB1PK	-	-	-	50.0	1	(7)	
			11-15-13	DM			

Chemical/Reagent ID:

HNO<sub>3</sub>: B1445      H<sub>2</sub>SO<sub>4</sub>: B1491      HCl: -  
5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: B2317      5% KMnO<sub>4</sub>: MP2552      Digest Tube Lot: 1303205





# Mercury Digestion Log

Prep Code: FRM

Matrix: Tissue

Analyst: DM

Date: 11-15-13

Bath Temp: 60°C

Start Time: 0855

End Time: 0925

ARI Sample ID	Sample Bottle #	pH<2	Initial Weight (g) Volume (mL)	Final Volume (mL)	# KMnO <sub>4</sub> Aliquots	CLP	Comments
XN61 A	1	—	1.069	50.0	<sup>11/23</sup> 1	Ⓢ	
" ADUP	1	—	1.074	↓	1	↓	
" ASDK	1	—	1.064	↓	1	↓	
" <sup>DM</sup> 11-15-13 ATB	1	—	1.049	↓	1	↓	
" MBI	—	—	—	↓	1	↓	
" MBI5PK	—	—	—	50.0	1	Ⓢ	
11-15-13 DM							

Chemical/Reagent ID:

HNO<sub>3</sub>: B1445

H<sub>2</sub>SO<sub>4</sub>: B1491

HCl: —

5% K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>: B2377

5% KMnO<sub>4</sub>: MP2552

Digest Tube Lot: 1303205