FINAL
SEDIMENT CHARACTERIZATION REPORT
BERTHS 163-164 MAINTENANCE DREDGING PROJECT
LOS ANGELES HARBOR

Submitted to:

Port of Los Angeles
Environmental Management Division
425 South Palos Verdes Street
San Pedro, California 90731

Submitted by:

AMEC Environment & Infrastructure, Inc.
9210 Sky Park Court, Suite 200
San Diego, California 92123

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EXECUTIVE SUMMARY

The Port of Los Angeles (Port) is proposing to conduct a maintenance dredging project at Berths 163-164 (Project). The proposed Project involves dredging to a design depth of -40 feet (ft) mean lower low water (MLLW) plus a two-ft overdredge allowance (to a final project depth of -42 ft MLLW). The Port is proposing to dispose of the dredged material from the Project at either the LA-2 Ocean Dredged Material Disposal Site (ODMDS) and/or the Port's agency-approved Confined Disposal Facility (CDF) located at Berths 243-245.

The Project location is at Berths 163 and 164, adjacent to the NuStar Energy and Valero (formerly Ultramar, LLC) industrial petroleum facilities. These facilities are located in the Slip 1 area of the West Basin directly north of the Los Angeles Harbor Turning Basin. The site is bordered by the Port's Construction and Maintenance Division facility to the north, and the Borax dry bulk terminal to the south.

As part of the permitting process for the maintenance dredging Project, the Port contracted AMEC Environment & Infrastructure (AMEC) to conduct a sediment characterization study of the Berths 163-164 dredge footprint to assess the suitability of the dredged materials for placement at either of the proposed disposal location.

A previous sediment characterization study within the Project site was performed in 1996 by Kinnetic Laboratories, Inc. (Kinnetic) and ToxScan, Inc. The results indicated that a portion of the Berths 163-164 sediments were suitable for disposal at LA-2 ODMDS and a portion was suitable for disposal at the Anchorage Road upland dredge material disposal facility. More recently, a second dredged material study was conducted at Berths 163-164 by Kinnetic as part of the Port of Los Angeles 2006 Marine Exploration program for the Federal Channel Deepening Project. The results of this study indicated that material at Berths 163-164 was suitable for disposal at a CDF and/or upland disposal facilities, but the site was not dredged during that period.

The results of the chemical analyses conducted on the dredged material for this study indicated that the sediment contains elevated levels of several chemicals, particularly the metals lead, mercury, and zinc. Although the chemical levels were somewhat elevated for several chemicals of concern, none of the concentrations observed approached the California Title 22 criteria levels for hazardous waste determination, and elutriate analyses did not reveal any analytes which exceeded California Toxics Rule (CTR) criteria. However, solid-phase toxicity testing using a 10-day amphipod survivability test yielded survival rates of less than 50 percent for both the nearshore and offshore area sediment samples.

The combination of elevated sediment chemistry and poor amphipod survival indicated that placement of the dredged material at the LA-2 ODMDS would likely be unacceptable. Consequently, placement of the sediments, within the Berth 243-245 CDF was deemed the primary disposal option for the proposed Project. Since CDF disposal was deemed the primary disposal option, no further Green Book toxicity or bioaccumulation testing was performed.

The results of this sediment characterization study indicate that the Project sediments are suitable for disposal within the Berth 243-245 CDF, but not for placement at the LA-2 ODMDS.

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ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
%	Percent
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AMEC	AMEC Environment & Infrastructure, Inc.
BP	bioaccumulation-phase
Calscience	Calscience Environmental Laboratories, Inc.
CCC	Criterion Continuous Concentration
CDF	Confined Disposal Facility
CMC	Criteria Maximum Concentration
CTR	California Toxics Rule
cy	cubic yard(s)
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DGPS	differential global positioning system
ERL	Effects-Range Low
ERM	Effects-Range Median
ft	foot/feet
Inland Testing Manual	*Evaluation of Dredged Materials Proposed for Discharge in Waters of the U.S.* EPA-823-B-98-004
Kinnetic	Kinnetic Laboratories, Inc.
L	liter
Lab Dup	laboratory duplicate
LC_{50}	median lethal concentration
LCS	Laboratory Control Sample
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MLLW	mean lower low water
MS	Matrix spike
MSD	Matrix spike duplicate
Nautilus	Nautilus Environmental
ng/L	nanograms per liter
NOAA	National Oceanic and Atmospheric Administration

ACRONYMS AND ABBREVIATIONS (Cont.)

ODMDS	Ocean Dredged Material Disposal Site
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
Port	Port of Los Angeles
Project	Berths 163-164 Maintenance Dredging Project
QA/QC	quality assurance / quality control
RPD	Relative Percent Difference
SAP	Sample and Analysis Plan
SM	Standard Methods
SOP	Standard Operating Procedure
SP	solid-phase
SPP	suspended particulate-phase
TEG	TEG Oceanographic Services
TOC	Total Organic Carbon
ToxScan	ToxScan, Inc.
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
TTLC	Total Threshold Limit Concentration
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

This document serves as the Sediment Characterization Report for the Port of Los Angeles (Port) Berths 163-164 Maintenance Dredging Project (Project). The proposed Project involves the dredging of sediment in Los Angeles Harbor and the offsite disposal of the dredged material at the LA-5 Ocean Dredged Material Disposal Site (ODMDS) and/or the Berths 243-245 Confined Disposal Facility (CDF).

AMEC Environment & Infrastructure, Inc. (AMEC) was contracted by the Port to prepare a Project-specific Sampling and Analysis Plan (SAP), conduct sediment and seawater sampling at the Project site, and provide this Sediment Characterization Report based on results from laboratory testing. AMEC prepared a SAP in April 2013 and submitted it to the Los Angeles Contaminated Sediments Task Force (CSTF) for review and concurrence. The specifics of the characterization program where presented to the CSTF at its April 24, 2013 monthly meeting. Based upon input from the CSTF, the SAP was revised and finalized in May 2013. The dredged material sample collection program was initiated in June 2013 and involved the collection of site water and sediment samples within the dredge footprint. Sediment and water samples were submitted to several laboratories for analysis. AMEC obtained physical and chemical test results from Calscience Environmental Laboratories, Inc. (Calscience) in June 2013, and received a report on toxicity test results from Nautilus Environmental (Nautilus) in August 2013. The purpose of this report is to provide an overview of the sediment quality within the project dredge footprint and to evaluate disposal suitability for the two disposal options being pursued.

1.1 Project Description

The Port is proposing to conduct maintenance dredging of the sediments adjacent to the NuStar Energy and Valero (previously Ultamar, LLC) industrial petroleum facilities located at Berths 163 and 164, respectively. These facilities are located in Slip 1 directly north of the Turning Basin in Los Angeles Harbor (Figure 1-1).

The proposed Project consists of two distinct dredge footprints; one nearshore and one offshore. For this sediment characterization study, the dredge footprint was partitioned into two separate testing areas, referred to as Composite Area A-Nearshore and Composite Area B-Offshore (Figure 1-2).

The dredge design depth for this project is -40 feet (ft) mean lower low water (MLLW) plus a 2 ft overdredge allowance for a total depth of -42 ft MLLW. The project total dredge volume is approximately 8,196 cubic yards (cy).

The primary disposal option being pursued for the Project is the LA-2 ODMDS (Figure 1-3). Alternatively, a secondary disposal option at the Port's agency-approved CDF located at Berths 243-245 is being considered if the proposed dredged materials are not suitable for ocean disposal (Figure 1-4). The disposal location will be selected based on the results of this sediment characterization study. The purpose of this study is to determine whether the Project dredged materials meet the suitability requirements for placement within the proposed disposal locations.

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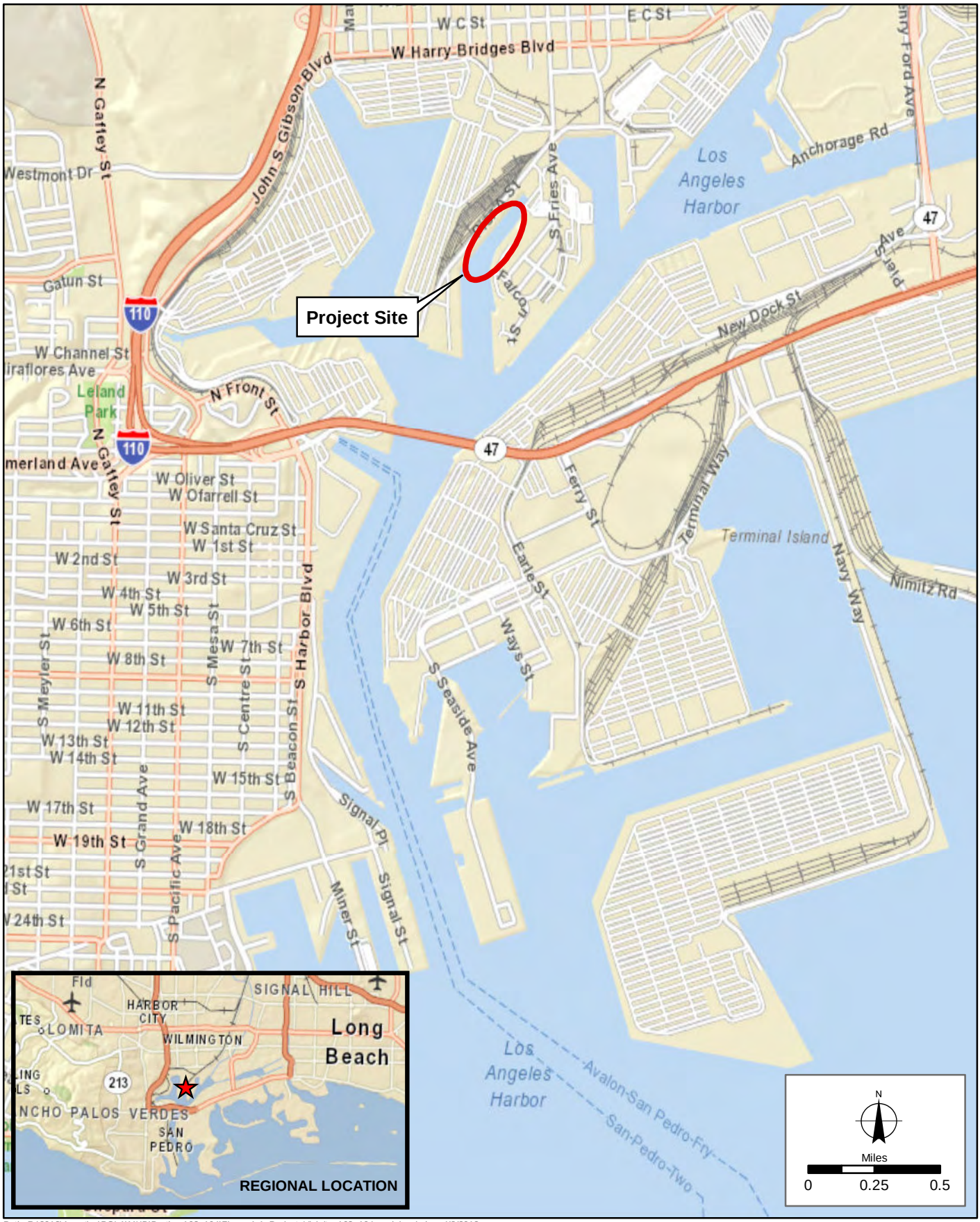

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Project Vicinity
Sediment Characterization Report
Berths 163-164 Maintenance Dredging Project
Port of Los Angeles

FIGURE

1-1

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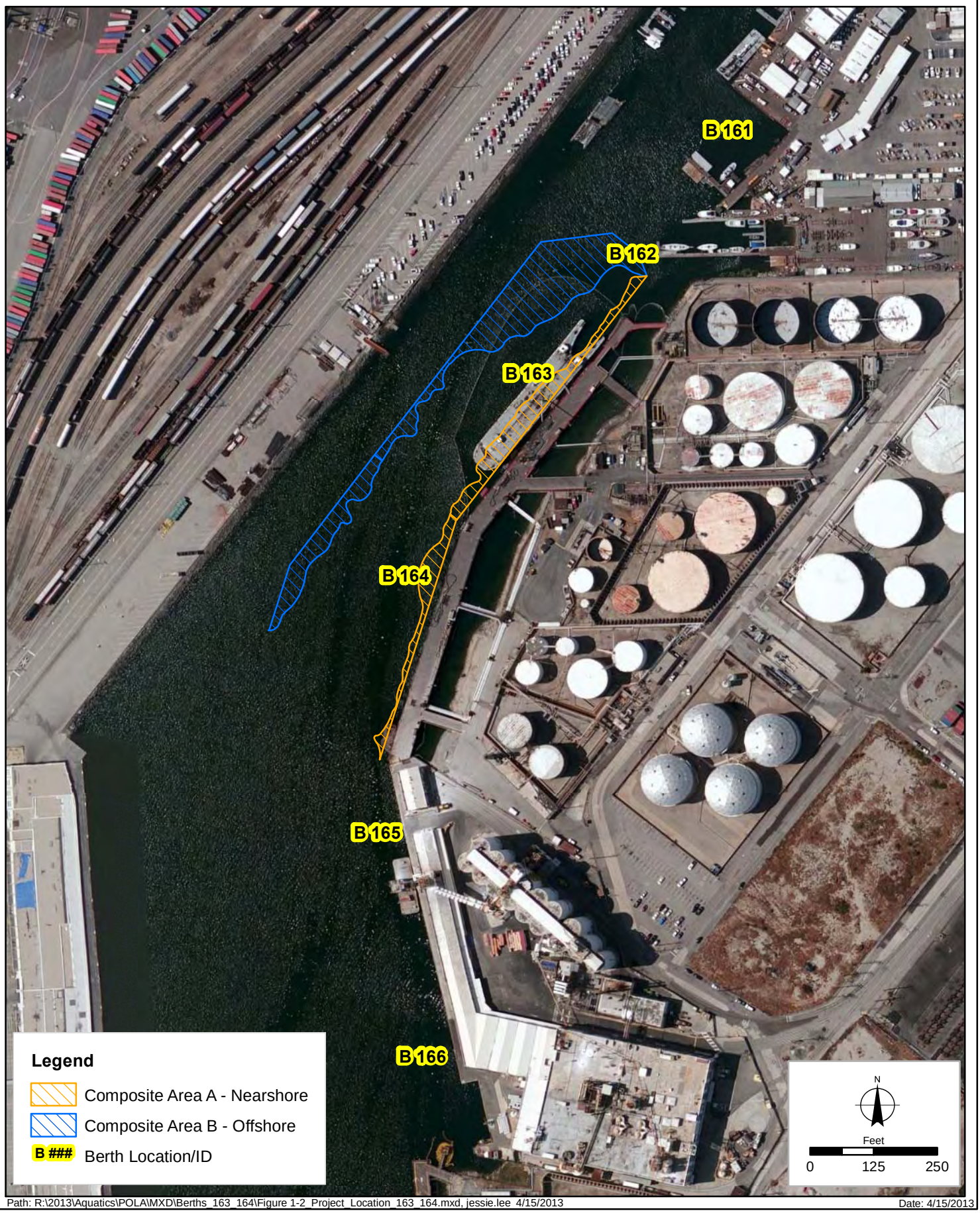

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Date: 4/15/2013

Project Location
Sediment Characterization Report
Berths 163-164 Maintenance Dredging Project
Port of Los Angeles

FIGURE

1-2

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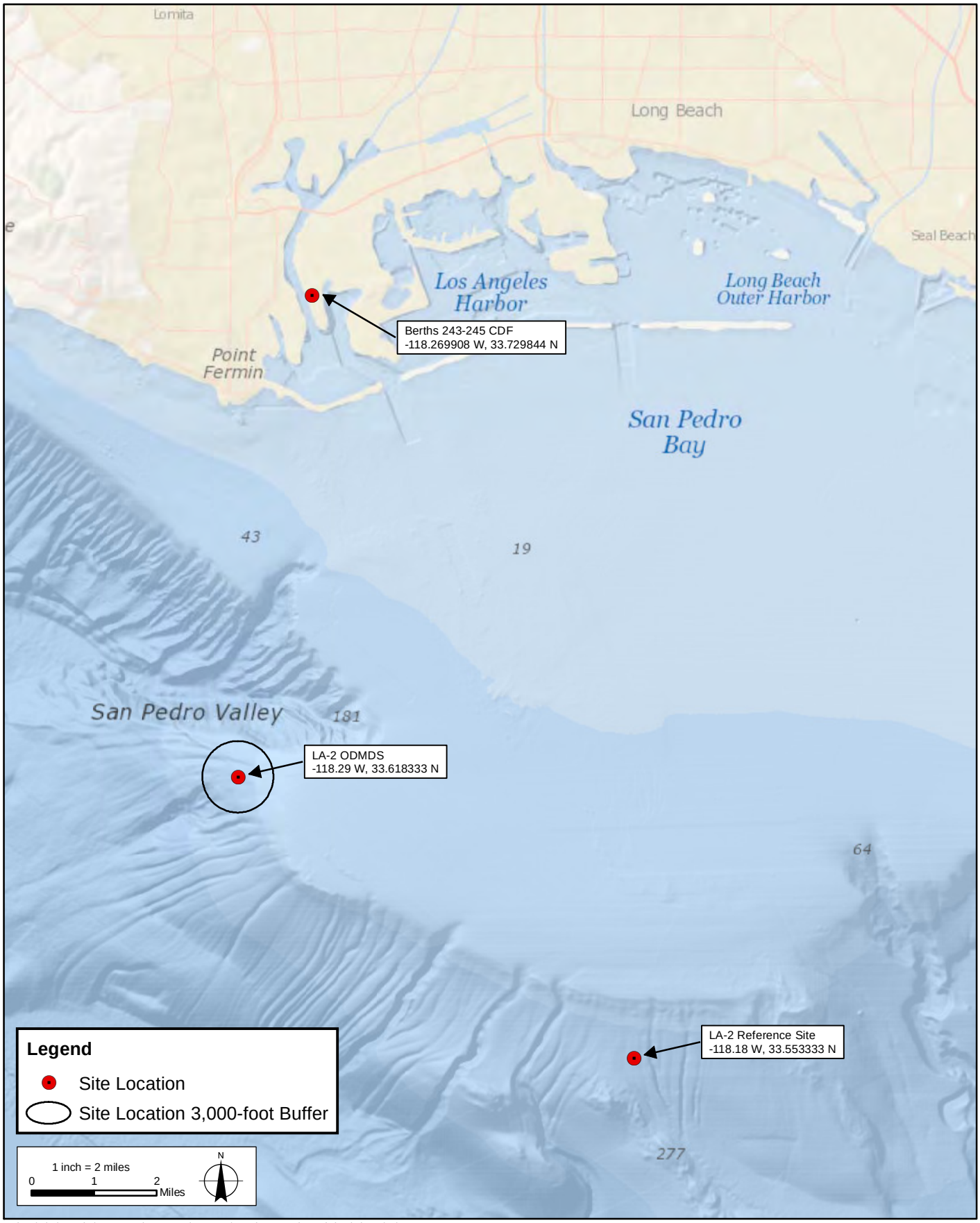

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Aerial Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

amec

Location of LA-2 Ocean Dredged Material Disposal and Reference Sediment Collection Sites

FIGURE 1-3

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Source: POLA - 2011

FIGURE

Berths 243-245 Confined Disposal Facility

1-4

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1.2 Land Uses and Influences

The Project site is located in Slip 1, north of the Port's Turning Basin. It is bordered by the Port's Construction and Maintenance Division facility to the north (Berth 161) and the former site of Wilmington Marine (Berth 162) and the Borax dry bulk terminal (Berths 165-166) to the south. Across from the Project site on the other side of Slip 1 is a paved surface parking lot used by Port personnel. The NuStar Energy and Valero facilities at Berths 163-164 are active industrial petroleum terminals. Both facilities have spill response best management practices located on shore in the event of petroleum spills.

1.3 Previous Sediment Characterization Studies

A report produced by Kinnetic Laboratories, Inc. (Kinnetic) and ToxScan, Inc. (ToxScan) documents environmental testing for dredging at the Project site in 1996 (Kinnetic and ToxScan 1996). In this study, sediment was evaluated to a depth of -42 ft MLLW and was analyzed for bulk sediment chemistry, toxicity, and bioaccumulation. The results of the study indicated that approximately 8,571 cy of the Berths 163-164 sediments were suitable for disposal at LA-2 ODMDS and approximately 4,375 cy was suitable for disposal at the Anchorage Road upland dredged material disposal facility.

More recently, a dredged material study was conducted at Berths 163-164 by Kinnetic as part of the Port of Los Angeles 2006 Marine Exploration Program carried out for the Federal Channel Deepening Project (Kinnetic 2006). The 2006 sediment was tested to a depth of -44 ft MLLW. Although the material was determined to be suitable for disposal at a CDF and/or upland disposal facilities, the site was not dredged during this time.

Results of the 2006 Toxscan sediment characterization study are summarized in the following sections.

1.3.1 Bulk Sediment

According to the Kinnetic report, the sediments consisted primarily of sand (52.9 percent), with a near equal proportion of silt (22.8 percent) and clay (24.3 percent) making up the finer grained material. Organic carbon content was low (0.47 percent), and there were moderate levels of oil and grease (420 milligrams per kilogram [mg/kg]) and petroleum hydrocarbons (260 mg/kg). There were only a few elevated inorganic and organic contaminants in the Berths 163-164 composite sample. Arsenic, copper, mercury, total dichlorodiphenyldichloroethylene (DDE) and total dichlorodiphenyltrichloroethane (DDT) exceeded Effects Range Low (ERL) guideline values, however there were no Effects Range Median (ERM) guideline value exceedances. ERL and ERM guideline values are explained in Section 3.1. In addition, the overall mean ERM quotient (0.062) suggested little potential for toxic effects. Tributyltin was also present in bulk sediment chemistry samples at a concentration of 4.4 micrograms per kilogram (µg/kg), which was at in the lower end of the range reported by the California State Water Resources Control Board in 1988 for sediment in California coastal and delta waters.

1.3.2 Elutriate Chemistry

All inorganic and organic constituents were below California Toxics Rule (CTR) Criterion Continuous Concentration (CCC) screening criteria; in few cases, chemical levels were only slightly elevated above background water concentrations. Minor concentrations of a few polycyclic aromatic hydrocarbon (PAH) compounds were the only organic constituents detected in the 2006 elutriate sample.

1.3.3 Toxicity Testing

Elutriate (suspended particulate-phase [SPP]) results in 2006 indicated no toxicity to *Mytilus galloprovincialis* survival (median lethal concentration [LC_{50}] >100%) or to *M. galloprovincialis* normal development (median effective concentration >100%).

1.4 2013 Project Sediment Characterization Study

The 2013 sediment characterization study was designed to test for disposal suitability at either the LA-2 ODMDS or the Berths 243-245 CDF as follows.

AMEC proposed to conduct the sediment analysis portion of this study using a tiered approach. The first tier included sediment chemistry analysis on all 10 individual core samples, the two area composites, and the reference sediment. The first tier also involved solid-phase (SP) amphipod 10-day toxicity testing, using methods described the Green Book and ASTM 1998.

If the sediment chemistry results had been overall lower than established general sediment guidelines (e.g., ERLs and ERMs, [Buchman 2008; Long et al. 1995]), then the two composite area samples would be released for a full Green Book analysis including additional SP toxicity testing using marine worms, suspended particulate-phase (SPP) testing, and bioaccumulation phase (BP) testing (USEPA/USACE 1991).

Conversely, if the sediment chemistry results from the first tier of testing indicated that ocean disposal was not likely to be approved, no additional toxicity or bioaccumulation testing would be conducted. Instead, elutriate testing for Berths 243-245 CDF approval would be conducted in accordance with the Inland Testing Manual. Due to sediment chemistry and initial SP toxicity testing results, this was the approach used during this study.

The following sections provide information on sample collection methods and locations, sediment and elutriate chemistry and toxicity test methods and results, a comparison of the results to available sediment and water quality guidelines, data analysis, and quality assurance/quality control (QA/QC) evaluation of all results and deliverables for the proposed project. Core logs, chemistry reports and photographs are included as appendices to this document for reference.

2.0 MATERIALS AND METHODS

The following sections describe the locations and techniques that were employed to collect test sediments at 10 locations within two areas in the project dredge footprint. Coordination between AMEC and the Port, pertinent security personnel, TEG Oceanographic Services (TEG), and Calscience was conducted prior to the initiation of any field activities.

Sediment and site water collection followed the guidance provided in *Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual* (USEPA 2001), and detailed in the SAP submitted by AMEC to the Port prior to conducting sample collection and testing (AMEC 2013). The sample collection effort was documented using core logs and photography. Core logs are included as Appendix A; photographs of cores are included as Appendix B.

2.1 Sediment Collection

2.1.1 Core Collection Locations

To adequately characterize sediments within the proposed dredge footprint, AMEC partitioned the dredge footprint into two separate testing areas, Composite Area A-Nearshore (Berths 163-164 nearshore area) and Composite Area B-Offshore (Berths 163-164 offshore area). For this study, 10 vibracore samples, (five in each composite area) were collected (Figure 2-1). The vibracore samples were penetrated to the project depth of -40 ft MLLW, plus a two-foot overdredge allowance to -42 ft MLLW for both composite areas. AMEC also collected a Z-layer sediment sample from each core. The Z-layer sample consisted of the 0.5-ft core segment immediately below the overdredge allowance depth, or the sediment layer between -42 ft MLLW to -42.5 ft MLLW. The Z-layer represents the new or resultant harbor bottom once the proposed dredge material has been removed.

During the field effort, a differential global positioning system (DGPS) was used to navigate to each of the sampling locations listed in Table 2-1. To maintain position, a three-point anchoring technique was employed by tying to the nearby docks or anchoring the vessel in the substrate. Once the vessel was secured, AMEC recorded the position and the water depth (measured with a weighted fiberglass tape) in the field log. The water depth was corrected to MLLW using National Oceanographic and Atmospheric Administration (NOAA) tide tables and compared to the bathymetric data provided by the Port. The target navigational accuracy of the DGPS is ±3 meters.

Reference sediment was collected from the established offshore LA-2 Reference Site located at 33°33’12”, -118°10’48” by Seaventures on June 2, 2013 (Figure 1-3).

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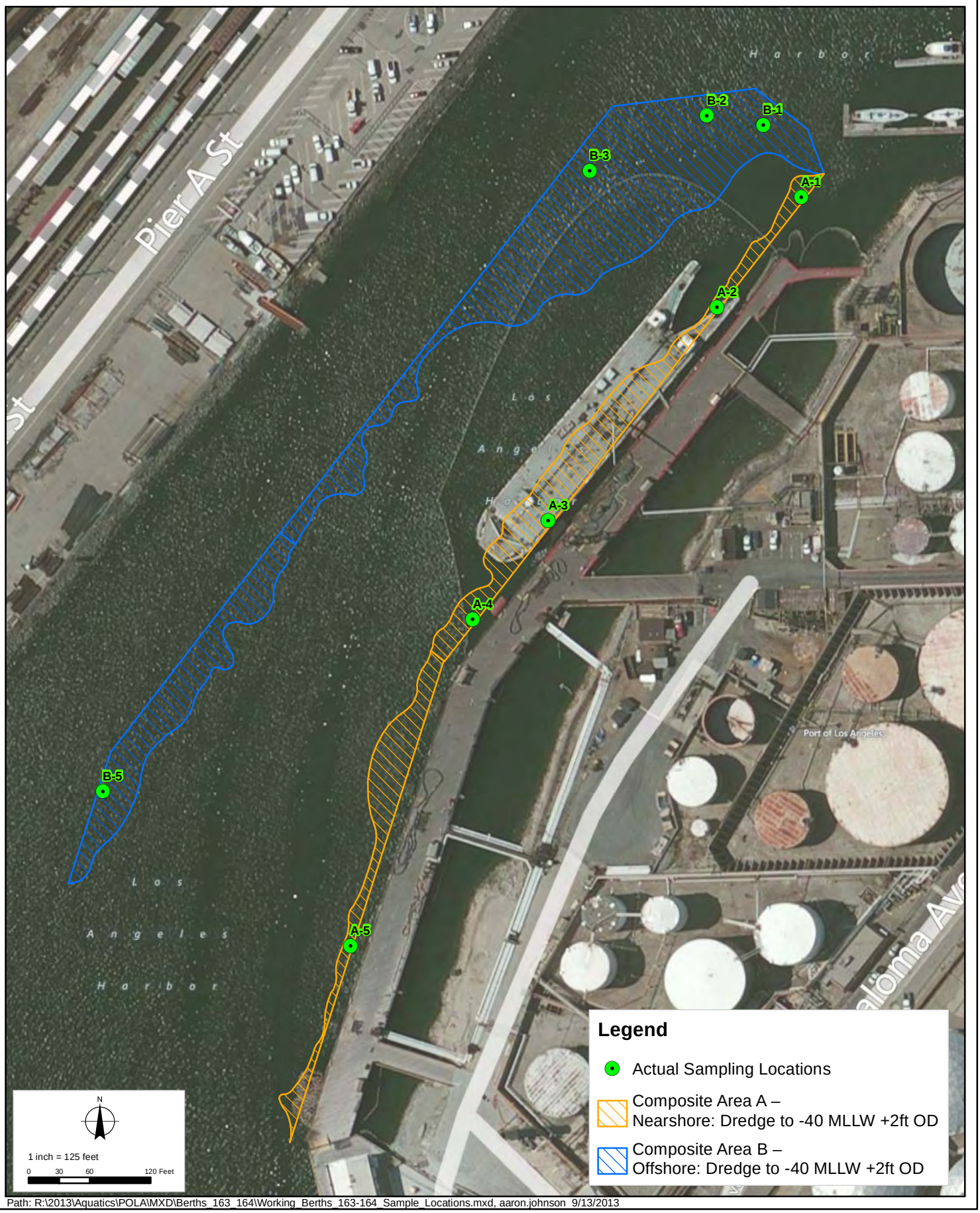

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Aerial Source: (c) 2009 Microsoft Corporation and its data suppliers

Sample Locations
Sampling and Analysis Plan
Berths 163-164 Maintenance Dredging Project
Port of Los Angeles

FIGURE

2-1

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Table 2-1.
Core Log Summary Table

Station ID	Attempt	Collection Coordinates		Sample Collection Depths			Notes
		Latitude WGS84 (DD° mm.mmm')	Longitude WGS84 (-DDD° m.mmm')	Existing Mudline[1] (ft MLLW)	Penetration Depth (ft)	Total Core Length (ft)	
Composite Area A-Nearshore							
A1	1	33'45.6720	-118'15.991	-32.9	4.5	4.2	No Z-layer; core samples collected.
	2	33'45.6711	-118'16.9907	-32.5	4.0	3.2	Refusal, no Z-layer.
A2	1	33'45.6540	-118'16.0080	-34.4	6.5	6.1	No Z-layer, but bottom material appears to be clean/native sand. Large piece of rubber in core catcher. No samples collected.
	2	33'45.6529	-118'16.0051	-35.2	7.3	6.1	Z-layer sampled between 5.6' to 6.1', core samples collected from Attempt 2 because Z layer reviewed.
	3	33'45.6522	-118'16.0052	-34.8	7.7	6.5	Z-layer added to composite from 6.0' to 6.5'.
A3	1	33'45.6200	-118'16.0400	-38.0	4.5	4.2	No refusal. Z-layer collected from 3.7' to 4.2'.
	2	33'45.6188	-118'16.0389	-39.7	1.5	2.3	Hit refusal. No Z-layer. Plug fell out into water upon retrieval.
	3	33'45.6178	-118'16.0395	-34.5	6.8	6.3	No Z-layer; hit refusal. Plug looks like clean/native sand similar to Attempt 1 Z-layer. Core collected on very steep slope (A) collected of core to 5.8', A3-A & 5.8' to 6.3' A3-B.
A4	1	33'45.6040	-118'16.0550	-37.9	4.6	4.9	No plug. Core expanded upon extraction due to unconsolidated section at top. 4.4' to 4.9' sampled for Z-layer.
	2	33'45.6043	-11816.0530	-36.0	5.5	5.4	Sampling on side slope. Core began to tip during penetration.
A5	1	33'45.5510	-118'16.0790	-39.0	4.7	4.7	Plug material is soft. Lost samples from Attempt 1.
	2	33'45.5511	-118'16.0772	-38.0	4.5	3.5	Plug is soft.
Composite Area B-Offshore							
B1	1	33'45.6839	-118'15.9988	-38.5	4.0	4.0	Z-layer sampled from 3.5' to 4.0'. Strata at 3.3', no subsample because section included in Z-layer sample. Slight sheen in water. Piece of creosote.
	2	33'45.6839	-118'16.0004	-38.5	4.0	3.3	Z-layer added to composite from 2.8' to 3.3' (2nd bag).
	3	33'45.6845	-118'15.9990	-38.7	3.8	3.5	Plug photos have incorrect Attempt & sample time.

Table 2-1.
Core Log Summary Table (Cont.)

Station ID	Attempt	Collection Coordinates		Sample Collection Depths			Notes
		Latitude WGS84 (DD° mm.mmm')	Longitude WGS84 (-DDD° m.mmm')	Existing Mudline[1] (ft MLLW)	Penetration Depth (ft)	Total Core Length (ft)	
B2	1	33'45.6854	-118'16.0097	-37.2	5.3	3.6	3.1' to 3.6' sampled as Z-layer.
	2	33'45.6858	-118'16.0094	-37.2	5.3	4.1	Attempt 2 jarred whole core (1x8oz, 1x16oz); lost catcher plug on retrieval, no Z-layer recovered.
	3	33'45.6865	-118'16.0092	-37.8	4.7	3.4	Z-layer collected from 2.9' to 3.4'; added to separate bag to be composited.
B3	1	33'45.6764	-118'16.0324	-38.2	4.3	3.9	Z-layer contaminated/mixed with material from top of core. Not sampled because not a clean representation of potential resultant surface.
	2	33'45.6763	-118'16.0328	-38.2	4.3	4.2	Z-layer sampled (jar & ziplock).
	3	33'45.6777	-118'16.0334	-38.0	4.5	4.4	Z-layer bagged only.
B4	1	33'45.6299	-118'16.0769	-40.0	2.5	2.5	Z-layer and core collected from core. Material is entirely in over dredge.
	2	33'45.6293	-118'16.0769	-40.0	2.5	2.4	Z-layer added to new bag for compositing.
	3	33'45.6924	-118'16.0778	-40.0	2.5	2.5	Z-layer added to new bag for compositing.
B5	1	33'45.5758	-118'16.1266	-38.1	4.4	2.9	Z-layer and core samples collected.
	2	33'45.5745	-118'16.1272	-38.2	4.3	2.9	(A) collected from Z-layer. Z-layer added to second composite baggie B5-A.
Reference Site							
Reference	N/A	33'33.200	-118'10.800	N/A	N/A	N/A	Sample collected using a pipe dredge.

Notes:
1. Determined at the time of sampling
ft - foot/feet
MLLW - mean lower low water
(A) - archive
N/A - non applicable

It is common when performing vibracore operations in Los Angeles Harbor to encounter the Malaga Mudstone Formation that the vibracore will not penetrate. The Malaga Mudstone Formation consists mostly of massive radiolarian mudstone or fine-grained siltstone with layers of diatomite and diatomaceous shale and limestone concretions and lenses (Woodring, Bramlette, and Kew 1946). The Malaga Mudstone Formation is only found along the northern and eastern margins of the Palos Verdes hills. When the Malaga Mudstone Layer is encountered, it typically leaves a "plug" of hard material in the core cutter and further penetration is “refused”. The presence of the plug in the extracted core material verifies the native “refusal” depth. Native “refusal” typically represents the extent of recently deposited material and indicates that further attempts of collection to the design and overdredge depth are unnecessary. In several instances during the Project, the Field Manager was unable to verify that the Malaga Mudstone Formation was reached (i.e., no plug) and the core had not achieved the desired target penetration (to dredge design depth plus a 2-ft overdredge allowance). In these cases, the collection boat was repositioned slightly and a second (and third, if necessary) core attempt was made to verify refusal.

2.1.2 Test Sediment Collection

Trained TEG equipment technicians deployed the vibracore used for sediment sample collection. The vibracore uses a 4-inch-diameter aluminum tube connected to a stainless-steel cutter. The aluminum-encased vibrating unit uses 240-volt, 3-phase, 26-amp electricity to drive two counter-rotating concentric vibrators. The vibracore and tube were lowered by a hydraulic winch and vibrated until penetration to project depth was achieved. Core penetration depth was determined using a tape measure attached to the vibracore head. After the vibracore was turned off, the sediment core was returned to the boat’s deck for processing. Once onboard, core samples were carefully extruded into clean, polyethylene-lined trays, photographed, and inspected for unique strata, color, odors, etc.

2.1.3 Site Water Collection

Site water was collected for elutriate analysis by AMEC scientists near the proposed dredging area. Collection was performed using a 2.2 liter (L) Van Dorn water sampling device near the proposed dredging area. The device was lowered to mid-water depth for collections to ensure no floating debris or other contaminants (i.e. oil, foam, or similar material) were included in the sample. All site water was stored in 10-L polyethylene cubitainers and delivered to Calscience, where it was used to prepare standard elutriates for chemical analysis.

2.1.4 Test Sediment Compositing

The site composites were prepared by combining the sediment collected at the five individual core locations in each designated composite area and thoroughly homogenizing them together. The final mixtures were considered a representative composite sample for each composite area, which was then subsampled for physical and chemical analyses as well as for archiving purposes. Subsamples collected for analysis were transferred to Calscience in labeled 16-ounce glass jars and plastic bags for chemical testing and grain size analyses, respectively.

Archived samples were collected and handled in the same manner as the test material, then frozen -20 degrees Celsius (°C), and stored at AMEC's office. Archive samples will be retained for one year from the collection date.

2.2 Sample Collection Documentation, Handling and Delivery

Sample documentation followed procedures included in the SAP. The integrity of each sample from the time of collection to the point of data reporting was maintained throughout the study by recording accurate core logs, filling out chain-of-custody forms at the time of sample collection, and photographically documenting each core and collection attempt.

Once each sediment sample was photographed and logged, the sample material was homogenized, subsampled for analytical and archival purposes, and the remainder was retained for testing. Immediately after analytical sample containers were filled, all sample containers and retained material were placed on ice in a cooler at 4 C. Sediment samples were delivered to the laboratory on 11 June 2013.

2.3 Chemical and Physical Analysis

In order to assess inland disposal suitability, sediment and site water analysis was conducted according to guidelines set forth in the U.S. Environmental Protection Agency (USEPA) / U.S. Army Corps of Engineers (USACE) *Evaluation of Dredged Materials Proposed for Discharge in Waters of the U.S.* EPA-823-B-98-004 (Inland Testing Manual).

Sediment core samples collected from the dredge footprint underwent analyses for grain size and a full suite of chemicals including metals, chlorinated pesticides, polychlorinated biphenyl congeners (PCBs), PAHs, pyrethroid pesticides, phenols, phthalates and organotins. The physical and chemical analyses, EPA and USACE approved analysis methods, and target detection limits for sediment and elutriate testing are listed in Table 2-3.

In addition to bulk sediment chemistry tests, dredged material was subjected to elutriate analyses to evaluate the potential for soluble chemicals to release into the water column during dredging and disposal operations.

2.3.1 Chemical Analysis

Full laboratory reports including: analytical methods, detection limits, and relevant QA/QC information are provided in Appendix C. A sample analysis matrix for whole sediment chemicals is provided in Table 2-3. Calscience, a California-accredited laboratory, conducted all analytical chemical analyses on both the sediment and elutriate samples. Samples were analyzed according to EPA and USACE approved methodologies as summarized in the analytical laboratory report provided in Appendix C.

Table 2-3.
Chemical Analyses for Elutriate and Sediment Samples

Analyte	Analysis Method	Elutriate Target Detection Limits[a, b]	Sediment Target Detection Limits[a, b]
Total Solids	160.3/SM 2540 B	N/A	0.1 %
Total Organic Carbon	9060	N/A	0.1 %
Total Ammonia	SM 4500-NH3 B/C (M) / 350.2M[c]	N/A	0.2 mg/kg
Total Sulfides	376.2M[c]	N/A	0.5 mg/kg
Soluble Sulfides	SM 4500 S2 – D[c]	N/A	0.5 mg/kg
Arsenic	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Cadmium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Chromium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Copper	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Lead	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Mercury	7471A[d]	0.0002 mg/L	0.02 mg/kg
Nickel	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Selenium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Silver	6020/6010B[d]	0.001 mg/L	0.1 mg/kg
Zinc	6020/6010B[d]	0.005 mg/L	1.0 mg/kg
Total Lipids	NOAA 1993a[i]	N/A	N/A
TRPH	418.1M [d]	N/A	10 mg/kg
TPH (C6-C44)	8015B(M)/8015B[d]	N/A	5.0 mg/kg
PAHs[e]	8270C SIM/ GC/TQ[d]	0.2 µg/L	10 µg/kg
Chlorinated Pesticides[f]	8081A[d]	0.1 µg/L	1.0 – 20 µg/kg
PCB Congeners[g]	8270C SIM PCB[d]	0.02 µg/L	0.5 µg/kg
Phenols	8270C SIM [d]	N/A	20 – 100 µg/kg
Pyrethroids	GC/MS/MS[j]	N/A	0.5 – 1.0 µg/kg
Phthalates	8270C SIM [d]	N/A	10 µg/kg
Organotins	Rice/Krone[h]	3.0 ng/L	3.0 µg/kg

Notes:
[a] Sediment minimum detection limits are on a wet-weight basis.
[b] Reporting limits provided by Calscience Environmental Laboratories, Inc.
[c] Standard Methods for the Examination of Water and Wastewater, 19th Edition American Public Health Association et al. 1995.
[d] USEPA 1986-1996. SW-846. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition.
[e] Includes naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b,k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene.
[f] Includes aldrin, α-benzene hexachloride (BHC), β-BHC, γ-BHC (lindane), δ-BHC, chlordane, 2,4- and 4,4-dichlorodiphenyldichloroethane (DDD), 2,4- and 4,4-dichlorodiphenyldichloroethylene (DDE), 2,4- and 4,4-dichlorodiphenyltrichloroethane (DDT), dieldrin, endosulfan I and II, endosulfan sulfate, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, and toxaphene.
[g] PCBs (sum of 41 congeners: 18, 28, 37, 44, 49, 52, 66, 70, 74, 77, 81, 87, 99, 101, 105, 110, 114, 118, 119, 123, 126, 128, 138, 149, 151, 153, 156, 157, 158, 167, 168, 169, 170, 177, 180, 183, 187, 189, 194,201, and 206)
[h] Rice, C.D. et al. 1987, or similar (e.g. Krone et al. 1989)
[i] NOAA 1993
[j] Allethrin (Bioallethrin), Bifenthrin, Cyfluthrin-beta (Baythroid), Cyhalothrin-Lamba, Cypermethrin, Deltamethrin (Decamethrin), Esfenvalerate, Fenpropathrin (Danitol), Fenvalerate (sanmarton), Fluvalinate, Permethrin (cis and trans), Resmethrin (Bioresmethrin), Resmethrin, Sumithrin (Phenothrin}, Tetramethrin, and Tralomethrin

µg/kg - micrograms per kilogram (parts per billion)
µg/L - micrograms per liter
mg/kg - milligrams per kilogram (parts per million)
mg/L - milligrams per liter
ng/L - nanograms per liter
N/A - not applicable
PAH - polycyclic aromatic hydrocarbon
PCB - polychlorinated biphenyl
SM - Standard Methods
SOP - standard operating procedure
TPH - total petroleum hydrocarbons
TRPH - total recoverable petroleum hydrocarbons

2.3.2 Physical Analysis

Grain-size analysis was performed on the composite samples. The analyses were performed at Calscience using a laser method (ASTM D4464M). Percent gravel, sand, silt, and clay were reported to 0.1 percent, along with the corresponding millimeter and phi sizes, and a cumulative grain-size distribution diagram.

2.4 Toxicity Analysis

As outlined in Section 1.4, AMEC proposed to conduct the sediment analysis portion of this study using a tiered approach; the first tier included sediment chemistry analysis on all 10 individual core samples, the two area composites, and the reference sediment. The first tier also involved SP toxicity testing using amphipods. Upon completion of the first tier of tests, an interpretation of the results was used to determine if the next tier of toxicity testing (SPP) on bivalve larvae, fish and shrimp, followed by a 28-day BP test on bivalves and marine worms would commence. Based upon the results of the initial round of SP testing, it was determined that SPP and BP testing would not be performed.

2.4.1 Solid-Phase Toxicity Analysis

Ten-day amphipod SP tests are conducted under static or static-renewal (if porewater ammonia or dissolved oxygen [DO] levels are determined to be near organism threshold levels) conditions according to Green Book and ASTM 1998 protocols. The five replicate SP test chambers consisting of 1-L glass jars contain a 2-centimeter layer of control, reference, or test sediment, along with 950 milliliters (mL) of clean seawater. Test chambers are equilibrated for 24 hours before adding test organisms. Test chambers are lightly aerated for the duration of the test period.

Twenty amphipods were distributed randomly to each chamber. Water quality parameters of DO, pH, temperature, and salinity are measured prior to test initiation, then daily during the 10-day test period. Aliquots of pore water are collected and tested for total and un–ionized ammonia prior to test initiation. Aliquots of overlying water are collected from test chambers of each site at Days 0 and 10 for measurement of total and un–ionized ammonia. The organisms are not fed during the test period.

After 10 days, test organisms are removed by gently sieving the contents of each chamber through a 0.5 millimeter (mm) Nitex mesh screen. Organisms are collected on the screen and the number of surviving organisms is recorded.

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3.0 RESULTS

3.1 Bulk Sediment Chemistry Results

The sediment results for this study were evaluated for chemical contaminants in the sediment and to determine the potential for adverse effects to marine species and water quality during dredging and disposal. Sediment chemistry results are summarized in Table 3-1. All results are reported in dry weight. A more detailed summary is provided as Appendix C.

3.1.1 Sediment Quality Guidelines

The results of the analyses are compared to both California Title 22 Total Threshold Limit Concentration (TTLC) regulations and the NOAA ERL and ERM guidelines. The TTLC regulations determine if there are any hazardous waste levels of contaminants in the proposed dredged material. For placement of dredge sediment within a CDF, the comparison to TTLC numbers is essential as it measures the solubility of a particular contaminant and would help establish potential dredging best management practices and guide sediment placement.

The sediment chemical analyses results presented in Table 3-1 are compared to the ERL and ERM sediment quality guidelines as a relative measure of sediment quality (Buchman 2008; Long et al. 1995). These benchmark values for sediment quality were developed at NOAA using a variety of guideline values that have been developed to screen sediment results and evaluate potential effects on sediment-associated biota. The ERL and ERM guideline values were derived by matching chemical and biological data.

The ERL guideline values represent the lower 10th percentile concentration, and ERM values represent the median concentration at which statistically significant biological effects have been reported. These values were calculated using a large database of study results, including laboratory and field-generated data for a large number of end points for species and biological effects. In summary, the ERL values represent concentrations below which biological effects rarely occur, and ERM guideline values represent concentrations above which biological effects are likely to occur (Long et al. 1995). Due to the wide range of site-specific factors that may influence the toxicity and bioavailability of any given compound in the sediment, these guidelines are not intended for use as a strict criteria for regulatory application, but rather as a general screening gauge.

3.1.2 General Chemistry

General chemistry components analyzed as part of this project included total solids, total organic carbon (TOC), total ammonia, total and soluble sulfides, and oil and grease. Total solids were measured at 65.3 percent and 60.9 percent for Composite A-Nearshore and Composite B-Offshore sediment samples, respectively. TOC was measured at 1.90 percent and 3.00 percent in the Composite A-Nearshore and Composite B-Offshore samples, respectively. The concentration for total ammonia was 11.0 mg/kg in Composite A-Nearshore sample, and 14.0 mg/kg in the Composite B-Offshore sample. The concentration of total sulfide measured was 65.0 mg/kg in Composite A-Nearshore and 12.0 mg/kg for Composite B-Offshore. Soluble sulfides were not detected.

3.1.3 Metals

Of the ten metals analyzed, five metals (arsenic, copper, lead, nickel, and zinc) exceeded the ERL sediment quality guideline values but were lower than the ERM guideline values in the Composite A-Nearshore sample. Three of the ten metals analyzed (arsenic, copper, and nickel) exceeded their respective ERL guideline values in the Composite B-Offshore, but were lower than the ERM guideline values. Only mercury exceeded the ERM guideline value in the Composite A-Nearshore sample, with a concentration of 1.05 mg/kg. Three additional metals (lead, mercury, and zinc) exceeded their respective ERM guideline values in the Composite B-Offshore sample, at concentrations of 324 mg/kg, 0.890 mg/kg, and 580 mg/kg, respectively. None of the metals analyzed exceeded the State of California Title 22 Total Threshold Limit Concentration (TTLC) values (listed in Table 3-1) for determination as hazardous waste.

3.1.4 Chlorinated Pesticides

The pesticide 4,4'-DDE was detected at concentrations of 20.0 µg/kg and 10.0 µg/kg in the Composite A-Nearshore and Composite B-Offshore samples, respectively, which is above the ERL guideline value of 2.20 µg/kg. 4,4'-DDE was also detected in the reference sample at a concentration of 2.60 µg/kg, which is above the ERL guideline value. No other chlorinated pesticides were found above analytical detection limits.

3.1.5 Pyrethroids

The total detectable pyrethroids concentration measured in the Composite A-Nearshore sample was 22.8 µg/kg, and 16.1 µg/kg in the Composite B-Offshore sample. Of the 15 pyrethroids analyzed, four were concentrated at values ranging between 0.130 µg/kg and 12.0 µg/kg in the Composite A-Nearshore sample. Two pyrethroids were detected in the Composite B-Offshore sample, ranging from 2.10 µg/kg to 14.0 µg/kg. The remaining pyrethroids were not detected. California Title 22 TTLC values do not currently exist for pyrethroids.

3.1.6 Phenols

There were no detectable phenols found in the composited sediment samples from Berths 163-164. Sediment quality guidelines and California Title 22 TTLC values do not currently exist for phenols.

3.1.7 Phthalates

One of the six phthalates analyzed (Bis(2-Ethylhexyl) Phthalate) was detected at a concentration of 300 µg/kg in the Composite A-Nearshore sample and 96.0 µg/kg in the Composite B-Offshore sample. Bis(2-Ethylhexyl) Phthalate and dimethyl phthalate were both detected in the reference sediment, at concentrations of 14.0 µg/kg and 210 µg/kg, respectively. The remaining phthalates were not detected above method detection limits. Sediment quality guidelines and California Title 22 TTLC values do not currently exist for phthalates.

Table 3-1.
Sediment Chemistry Results Summary

Compound Name	Type	Units	TTLC[1] (wet weight)	Composite Area A-Nearshore (wet weight)	Composite Area B-Offshore (wet weight)	ERL[2]	ERM[2]	LA-2 Reference Sediment (dry weight)	Composite Area A-Nearshore (dry weight)	Composite Area B-Offshore (dry weight)
Solids, Total	General Chemistry	%	---	--	--	·	·	71.1	65.3	60.9
Total Organic Carbon	General Chemistry	%	---	1.24	1.83	·	·	0.770	1.90	3.0
Total Ammonia	General Chemistry	mg/kg	---	7.18	8.53	·	·	3.20	11.0	14.0
Total sulfides	General Chemistry	mg/kg	---	42.4	7.31	·	·	0.70	65.0	12.0
Soluble sulfides	General Chemistry	mg/kg	---	ND	ND	·	·	ND	ND	ND
Arsenic	Metals	mg/kg	*500*	10.4	12.0	**8.2**	**70**	2.86	**15.9**	**19.7**
Cadmium	Metals	mg/kg	*100*	0.483	0.688	**1.2**	**9.6**	0.195	0.739	**1.13**
Chromium	Metals	mg/kg	*2500*	31.7	29.9	**81**	**370**	21.3	48.6	49.1
Copper	Metals	mg/kg	*2500*	77.1	71.9	**34**	**270**	10.4	**118**	**118**
Lead	Metals	mg/kg	*1000*	73.1	197	**46.7**	**218**	5.37	**112**	**324**
Mercury	Metals	mg/kg	*20*	0.686	0.542	**0.15**	**0.71**	ND	**1.05**	**0.89**
Nickel	Metals	mg/kg	*2000*	14.7	18.0	**20.9**	**51.6**	10.9	**22.5**	**29.5**
Selenium	Metals	mg/kg	*100*	0.475	0.586	·	·	0.322	0.728	0.962
Silver	Metals	mg/kg	*500*	0.208	0.217	**1.0**	**3.7**	0.176	0.318	0.357
Zinc	Metals	mg/kg	*5000*	138	353	**150**	**410**	46.5	**212**	**580**
Total TPH	TPH	mg/kg	---	209	164	·	·	ND	320	270
TRPH	TRPH	mg/kg	---	470	390	·	·	18.0	720	640
Total Detectable PAHs	PAH	µg/kg	---	7,653	3,970	**4,022**	**44,792**	ND	**11,720**	**6,519**
Total Detectable DDTs	Chlorinated Pesticides	µg/kg	*1000*	13.1	6.09	**1.58**	**46.1**	**2.6**	**20.0**	**10.0**

Table 3-1.
Sediment Chemistry Results Summary (Cont.)

Compound Name	Type	Units	TTLC[1] (wet weight)	Composite Area A-Nearshore (wet weight)	Composite Area B-Offshore (wet weight)	ERL[2]	ERM[2]	LA-2 Reference Sediment (dry weight)	Composite Area A-Nearshore (dry weight)	Composite Area B-Offshore (dry weight)
Total Detectable PCBs	PCB Congeners	µg/kg	*50,000*	154	83.7	**22.7**	**<u>180</u>**	ND	**<u>235.9</u>**	**137.5**
Total Pyrethroids	Pyrethroids	µg/kg	---	14.9	9.81	·	·	ND	22.8	16.1
Total Phenols	Phenols	µg/kg	---	ND	ND	·	·	33	ND	ND
Total Phthalates	Phthalates	µg/kg	---	196	58.5	·	·	224	300	96.0
Total Organotins	Organotins	µg/kg	---	28.7	31.1	·	·	ND	44.0	51.0

Notes:
[1] – TTLC values are reported in wet weight; therefore, wet weight chemistry values should be used for comparisons.
[2] – ERL and ERM sediment quality guidelines are reported in dry weight; therefore, dry weight chemistry values should be used for comparisons.

% - percent
Bold - values exceeding ERL
TPH - total petroleum hydrocarbons
DDT - dichlorodiphenyltrichloroethane
µg/kg - micrograms per kilogram
< - less than
<u>Bold</u> - values exceeding ERM
TRPH - total recoverable petroleum hydrocarbons
PCB - polychlorinated biphenyl congeners
mg/kg - milligrams per kilogram
PAH - polycyclic aromatic hydrocarbons
ND - not detected
TTLC - total threshold limit concentration

3.1.8 Polycyclic Aromatic Hydrocarbons

Ten PAHs were measured at concentrations above their individual ERLs but below ERM values, including Total Detectable PAHs in sample Composite A-Nearshore. Only pyrene was measured at a concentration (2,700 µg/kg) above its ERM guideline value of 2,600 µg/kg in the Composite A-Nearshore sample. In the Composite B-Offshore sample, seven PAHs were measured above ERL guideline values but below the ERM guideline values, including Total Detectable PAHs.

Total Detectable PAH concentrations for the dredged material composites were 11,720 µg/kg in the Composite A-Nearshore sample, and 6,519 µg/kg in the Composite B-Offshore sample. The remaining results were below ERL guideline values. All other PAHs were not detected above analytical detection limits. California Title 22 TTLC values do not currently exist for PAHs.

3.1.9 Total Petroleum Hydrocarbons and Total Recoverable Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPH) in the sediment composites were detected at concentrations ranging from 8.60 mg/kg (C13-C14) to 56.0 mg/kg (C29-C32) in the Composite A-Nearshore sample, and 14.0 mg/kg (C41-C44) to 53.0 mg/kg (C29-C32) in the Composite B-Offshore sample. Total TPH was detected at concentrations of 320 mg/kg and 270 mg/kg in the Composite A-Nearshore and Composite B-Offshore samples, respectively. TPH was not detected in the lower range fractions (C6 to C11-C12) in either the Composite A-Nearshore or Composite B-Offshore samples. Total recoverable petroleum hydrocarbons (TRPH) were detected at 720 mg/kg and 640 mg/kg in Composite A-Nearshore or Composite B-Offshore samples, respectively. California Title 22 TTLC values do not currently exist for TPH or TRPH.

3.1.10 Organotins

The concentrations measured for total organotins were 44.0 µg/kg in the Composite A-Nearshore sample, and 51.0 µg/kg in the Composite B-Offshore sample. Two organotins, dibutyltin and tributyltin, had concentrations of 16.0 µg/kg and 28.0 µg/kg in the Composite A-Nearshore sample, and 17.0 µg/kg and 34.0 µg/kg in the Composite B-Offshore sample, respectively. The remaining two organotins, monobutyltin and tetrabutyltin, were below detectable limits. California Title 22 TTLC values do not currently exist for organotins.

3.1.11 PCB Congeners

PCB congeners concentrations ranged from 57.0 µg/kg for PCB049 to less than the detection limit of 0.770 µg/kg in the Composite A-Nearshore sample. PCB congeners concentrations ranged from 38.0 µg/kg for PCB049 to less than the detection limit of 0.820 µg/kg in the Composite B-Offshore sample. The concentration of total detectable PCBs in the Composite A-Nearshore sample was 236 µg/kg, which exceeds the ERM guideline value of 180 µg/kg. In the Composite B-Offshore sample, the concentration of total detectable PCBs was 138 µg/kg,

which exceeds the ERL guideline value of 22.7 µg/kg, but does not exceed the ERM guideline value mentioned above. California Title 22 TTLC values do not currently exist for PCB congeners.

3.2 Elutriate Chemistry Results

Elutriate chemistry results are presented in Table 3-2. A more detailed elutriate chemistry summary is provided as Appendix D.

The chemical composition of the site water was also analyzed and reported to verify ambient water conditions for comparison purposes. The site water underwent the same mixing method as used for elutriate preparation, sans sediments. Elutriate and site water chemistry results were compared to CTR, CCC, and criteria maximum concentration (CMC) values (California Toxics Rule, 2000).

3.2.1 General Chemistry

Total suspended solids were measured in the elutriate sample. The concentration was 54.0 milligrams per liter (mg/L) and 8.80 mg/L in the Composite A-Nearshore and Composite B-Offshore samples, respectively. There are no CCC or CMC values for total suspended solids.

3.2.2 Metals

None of the ten metals that were analyzed in the elutriate water were detected at concentrations which exceeded the CCC values.

3.2.3 Chlorinated Pesticides

There were no chlorinated pesticides measured above analytical detection limits in the elutriate samples.

3.2.4 Pyrethroids

There were no pyrethroids measured above analytical detection limits in the elutriate or site water samples.

3.2.5 Polycyclic Aromatic Hydrocarbons

Three PAHs were detected in the elutriate sample Composite A-Nearshore, with concentrations ranging from 0.410 micrograms per liter ([µg/L]; pyrene) to 0.700 µg/L (acenapthene). Total detectable PAHs for the Composite A-Nearshore sample were calculated to be 1.65 µg/L. No PAHs were measured in the Composite B-Offshore elutriate or site water samples.

3.2.6 PCB Congeners

There were no PCB Congeners measured above analytical detection limits in elutriate or site water samples.

Table 3-2.
Elutriate Chemistry Summary

Compound Name	Type	Units	CCC	CMC	Composite A-Nearshore	Composite B-Offshore	Site Water
Total Suspended Solids	General Chemistry	mg/L	.	.	54	8.8	--
Arsenic	Metals	µg/L	**36**	**69**	2.27	5.41	1.52
Cadmium	Metals	µg/L	**9.3**	**42**	0.124	0.145	0.0675
Chromium	Metals	µg/L	.	.	0.592	0.543	ND < 0.500
Copper	Metals	µg/L	**3.1**	**4.8**	1.03	2.74	2.52
Lead	Metals	µg/L	**8.1**	**210**	0.436	0.423	0.0874
Mercury	Metals	µg/L	.	.	ND < 0.0500	ND < 0.0500	ND < 0.0500
Nickel	Metals	µg/L	**8.2**	**74**	1.01	1.03	0.607
Selenium	Metals	µg/L	**71**	**290**	0.367	0.573	ND < 0.0500
Silver	Metals	µg/L	.	**1.9**	ND < 0.0500	ND , 0.0500	ND < 0.0500
Zinc	Metals	µg/L	**81**	**90**	6.71	16.9	8.27
Total Detectable PAHs	PAH	µg/L	.	.	1.65	ND	ND
Total Detectable DDTs	Chlorinated Pesticides	µg/L	.	.	ND	ND	0.17
Total Chlorinated Pesticides	Chlorinated Pesticides	µg/L	**0.001**	**0.13**	ND	ND	ND
Total Detectable PCBs	PCB Congeners	µg/L	**0.03**	.	ND	ND	ND
Total Pyrethroids	Pyrethroids	µg/L	.	.	ND	ND	ND
Total Organotins	Organotins	ng/L	.	.	ND	ND	ND

Notes:
ND - not detected
CCC - criterion continuous concentration
CMC - criterion maximum concentration
< - less than
DDT - dichlorodiphenyltrichloroethane
mg/L - milligrams per liter
µg/L - micrograms per liter
ng/L - nanograms per liter
PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyl congeners

3.2.7 Organotins

There were no organotins measured above analytical detection limits in elutriate or site water samples.

3.3 Physical Analysis

Grain size analysis was performed on the two dredged material composite samples. The mean grain size of the Composite A-Nearshore sample was classified as medium sand due to a high proportion of gravel in the sample (13.9 percent), and the Composite B-Offshore sample was classified as silt. Grain size distribution and mean grain size for each sample was classified by Calscience using methods described in Plumb 1981. A more detailed summary of grain size fractions is presented in Table 3-3. The original grain size lab data report from Calscience is provided in Appendix C.

Table 3-3.
Grain Size Results

Analytical Method	Grain Size	Units	Reference	Composite Area A-Nearshore	Composite Area B-Offshore
ASTM D464 (M)	Clay	%	7.24	23.1	27.8
	Silt	%	31.6	61.8	68.0
	Total Silt and Clay	%	38.8	84.9	95.8
	Very Fine Sand	%	44.6	1.24	4.19
	Fine Sand	%	16.6	ND	ND
	Medium Sand	%	0.01	ND	ND
	Coarse Sand	%	ND	ND	ND
	Very Coarse Sand	%	ND	ND	ND
	Gravel	%	ND	14.0	ND

Notes:
(M) - modified
% - percent
ND - non-detect

3.4 Toxicity Results

Amphipod toxicity tests were performed on two composite samples collected for the sediment characterization study; Composite A-Nearshore and Composite B-Offshore. The testing was performed using a tiered testing approach beginning with SP testing (10-day amphipod survivability). The results of the toxicity testing are summarized in Table 3-4, and the laboratory report is included in Appendix C.

Table 3-4.
Solid-Phase Toxicity Test Results

Site	*Eohaustorius estuaries* Mean Survival Rate (%)	Standard Deviation
Laboratory Control (Native Sediment)	97	4.5
Fine Grain Size Control	95	6.1
LA-2 Reference	98	2.7
Berths 163-164 Composite A	**46***	12
Berths 163-164 Composite B	**45***	16

Notes:
Bold asterisk values are significantly reduced compared to the mean survival in the LA-2 Reference sediment.
% - percent

SP testing using the amphipod 10-day survivability test was the first test in the proposed tiered toxicity testing approach. The first tier SP test was initiated on 14 June 2013 using *Eohaustorius estuaries.* Lab control and the fine grain control samples met the control acceptability criterion of ≥90 percent survival for this species, with survival rates of 97 percent and 95 percent, respectively. The test sediments for the Composite A-Nearshore and Composite B-Offshore samples yielded mean survival rates of 46 percent and 45 percent, respectively. The test sediment from the LA-2 Reference site had a mean survival rate of 98 percent.

Mortality in the test sediment exceeded that in the reference sample by 20 percent or more for both species during the SP testing; therefore statistical tests were required. *Eohaustorius* survival was significantly decreased in both composite samples relative to the LA-2 Reference material and the fine grain size control samples. The composite samples also did not meet the LPC for benthic toxicity as defined in the Green Book. Based on these results, additional toxicity and bioaccumulation testing was not performed. Solid-phase toxicity results are presented in Table 3-4. The solid-phase toxicity test lab report is included as Appendix E.

3.5 Data Validation

QA data is presented in full detail within the original chemistry and toxicity reports (Appendix C and D). This section summarizes the results of the QC procedures used to ensure that the chemistry data reported is valid.

3.5.1 Sediment Data Validation

3.5.1.1 Laboratory Duplicates

A laboratory duplicate was performed for the Composite B-Offshore sediment sample; the precision for analysis between the two samples was within 30 percent. Laboratory duplicate data is included in the full analytical chemistry report located in Appendix C.

3.5.1.2 Calibration

Frequency and control criteria for initial and continuing calibration verifications were met. The method detection limits were met.

3.5.1.3 Blanks

Concentrations of target analytes in the method blank were found to be below reporting limits for all testing.

3.5.1.4 Laboratory Control Samples

A laboratory control sample (LCS) analysis was performed for each applicable test. All parameters were within established control limits.

3.5.1.5 Surrogates

Surrogate recoveries for all applicable tests and samples were within acceptable control limits with the following exceptions.

One of the chlorinated pesticides by EPA 8081A surrogates, decachlorobiphenyl, was outside the control limits in samples Composite A-Nearshore sample due to matrix interference. The results have been flagged with the appropriate qualifiers.

One of the PCB Congeners by EPA 8270C SIM surrogates, 2-fluorobiphenyl, had low recovery in samples Composite A-Nearshore and Composite B-Offshore. The results have been appropriately flagged.

3.5.1.6 Matrix Spikes

Matrix spiking was performed at the required frequencies for the sediment on both project and non-project samples. All matrix spike (MS) parameters outside the acceptable control limits were noted below.

For metals by EPA 6020, the zinc MS recovery was outside of the control limits. Since the LCS recoveries were in control, the results are released with no further action.

For chlorinated pesticides by EPA 8081A, DDD, DDT, and methoxychlor were outside the control limits. Since the LCS recoveries were in control the results are released with no further action.

The tributyltin MS recovery was outside the control limits. Since the LCS recoveries were in control the results are released with no further actions.

For PCB Congeners by EPA 8270C SIM, PCB congeners 77 and 101 had high recovery in the MS. Since the LCS recoveries were in control the results are released with no further action.

3.5.2 Elutriate Data Validation

3.5.2.1 Calibration

Frequency and control criteria for initial and continuing calibration verifications were met.

3.5.2.2 Blanks

Concentrations of target analytes in the method blanks were found to be below reporting limits for all testing.

3.5.2.3 Reporting Limits

The method detection limits were met.

3.5.2.4 Laboratory Control Samples

An LCS analysis was performed for each applicable test. All parameters were within established control limits with the following exceptions:

For PAHs by EPA 8270C SIM, the anthracene recovery was outside the standard control limits, but within the marginal exceedance (ME) limits. Since one ME is allowed, the data represented are released with no further actions.

3.5.2.5 Matrix Spikes

Due to limited volume, a MS was performed on non-Project samples. All parameters were within the acceptable control limits, unless otherwise noted. Copper concentrations found in the site water sample exceeded the spiked concentration by a multiple of four, and therefore the no recovery could be calculated. Silver recovery was low in both the MS and the matrix spike duplicate. Given that the batch associated LCS recoveries were within acceptable limits, the data were released with no further action.

3.5.2.6 Surrogates

Surrogate recoveries for all applicable tests and samples were within acceptable control limits.

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4.0 DISCUSSION

The purpose of the proposed Project is to perform maintenance dredging at Berths 163-164. This sediment characterization study evaluates sediment quality at the Project site to determine disposal suitability. The two disposal options being considered are placement at the LA-2 ODMDS or in the Berths 243-245 CDF in the Los Angeles Harbor.

Bulk sediment chemistry, a toxicity SP test, and elutriate analyses were performed for this sediment characterization. Offshore disposal at the LA-2 ODMDS is the Port preferred disposal option; however, alternative disposal at the CDF located at Berths 243-245 is also being pursued. The sediment quality of this material was compared to available hazardous waste criteria in addition to biological effects guideline levels (i.e. ERLs and ERMs). Elutriate chemistry was compared to applicable water quality standards for the protection of aquatic life (California Toxics Rule 2000).

4.1 Bulk Sediment Chemistry

A total of ten vibracore samples were collected; five in the nearshore study area and five in the offshore study area. Samples within each of the nearshore and offshore areas were combined to create two composite samples (Composite A-Nearshore and Composite B-Offshore, respectively) for the sediment characterization study.

The results of the chemical analyses conducted on the Berths 163-164 composite sediment samples showed several metals, PAHs, PCBs, and chlorinated pesticides exceeded ERL/ERM guideline values, though none of the contaminants approached the California Title 22 criteria levels for hazardous waste determination. In addition, the sediment samples contained detectable concentrations of TPH, pyrethroids, pesticides, and organotins, but there are no regulatory criteria with which to compare the result values.

4.2 Elutriate Chemistry

The elutriate analysis was performed to evaluate the potential for resuspension of contaminants that may occur during the dredging and placement of the proposed dredged material. The results of the elutriate chemistry indicate that no detectable pyrethroids, PCB congeners, chlorinated pesticides, or organotins release into the water column would be expected during Project dredging or disposal. Three PAHs (acenaphthene, fluorine, and pyrene) were detected in the Composite A-Nearshore elutriate sample, but there are no regulatory criteria for comparison. There were also low levels of metals detected in the elutriate samples during the test; however no analytes were detected at or above their respective CCCs.

4.3 Toxicity Testing

Toxicity testing was performed using a multi-tiered approach. The first tier included an SP test using amphipods. The results of the SP testing indicated toxicity to the amphipods in the 10-day amphipod survivability test with a 46 percent survival rate for the Composite A-Nearshore sample, and a 45 percent survival rate for the Composite B-Offshore sample. Based on these results, no additional toxicity testing was conducted.

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5.0 CONCLUSION

The results of the Berths 163-164 dredged material characterization study showed the following:

- Sediments in the proposed dredge footprint contain elevated concentrations of several metal and organic contaminants compared to ERL and ERM guideline values.
- Sediment chemical levels were well below California Title 22 hazardous waste criteria levels.
- Elutriate tests found no exceedances of CTR criteria levels indicating that are no soluble containments if concern in the dredged material.
- Exposure to the sediments results in statistically significant mortality in amphipods during a 10-day solid-phase test.

Based upon these results, the proposed Berths 163-164 dredged material are unsuitable for placement at the LA-2 ODMDS, but are suitable for confined disposal within the Berths 243-245 CDF.

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APPENDIX A

CORE LOGS

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Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/5/2013 **Time:** 15:03

Latitude: 33°45.672'
Longitude: -118°15.991'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 32.9

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0 – 3.7		Silty Sand	Very Dark Greenish-gray	5GY 3/1	Organic Odor	Shell hash throughout to 3.7' Unconsolidated to 1.0' Organic sheen on water
3.7 – 4.2		Sand with Silt	Very Dark Gray	3/N	None	Dryer, solid prior to removal from core catcher
						Refusal at 37.4' MLLW

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Water Depth (ft): 35.0
Tide (ft): +2.1
Target Penetration (ft): 9.6
Actual Penetration (ft): 4.5
Recovered Core Length (ft): 4.2

Log of Station ID: A1-Attempt 1

Additional Notes: No Z-layer; core samples collected

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/5/2013 **Time:** 15:30

Latitude: 33°45.672'
Longitude: -118°15.991'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 32.5

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0 – 2.7		Silty Sand	Very Dark Greenish-gray	5GY 3/1		Less consolidated to 0.9' With shell hash throughout Organic sheen on water
2.7 – 3.2		Sand with Silt	Very Dark Gray	N 3/		Very dry from 2.7' to 3.2'

Water Depth (ft): 35.0
Tide (ft): +2.5
Target Penetration (ft): 10.0
Actual Penetration (ft): 4.0
Recovered Core Length (ft): 3.2

Log of Station ID: A1-Attempt 2

Additional Notes: Refusal, no Z-layer

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 12:36

Latitude: 33°45.654'
Longitude: -118°16.008'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 34.4

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0		Sandy Silt	Very Dark Greenish-gray	5GY 3/1	Slight Organic Odor	Shell hash, decreases with depth Surface to 0.3' layer of mussels
0.5						
1.0						
1.5						
2.0						
2.5						Shells only on outside of core after 2.5', maybe residuals from surface
3.0						
3.5						
4.0						At 4.0' proportion of sand increases
4.5						
5.0						

Water Depth (ft): 36.0
Tide (ft): +1.6
Target Penetration (ft): 8.1
Actual Penetration (ft): 6.5
Recovered Core Length (ft): 6.1

Log of Station ID: A2-Attempt 1

Additional Notes: No Z-layer, but bottom material appears to be clean/native sand. Large piece of rubber in core catcher. Samples not collected.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 12:36

Latitude: 33°45.654'
Longitude: -118°16.008'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 34.4

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
5.0		Fine grained Sand	Olive Gray	5Y 4/2	None	Appears clean/native
5.5						
6.0						
6.5						
7.0						
7.5						
8.0						
8.5						
9.0						
9.5						
10.0						

Water Depth (ft): 36.0
Tide (ft): +1.6
Target Penetration (ft): 8.1
Actual Penetration (ft): 6.5
Recovered Core Length (ft): 6.1

Log of Station ID: A2-Attempt 1

Additional Notes: No Z-layer, but bottom material appears to be clean/native sand. Large piece of rubber in core catcher. Samples not collected.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 12:56

Latitude: 33°45.654'
Longitude: -118°16.008'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 35.2

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0 – 3.0		Sandy Silt	Very Dark Greenish-gray	5GY 3/1	Slight Organic Odor	hell hash decreases with increased depth Some small sticks & other organic debris in core to 3.3' (A) A2-A from 0.0 to 3.3' Proportion of sand increase at 2.4'
3.0 – 5.0		Fine grained Sand	Olive Gray	5Y 4/2	None	Looks clean/native below 3.2' (A) A2-B from 3.3' to 6.1'

Water Depth (ft): 36.8
Tide (ft): +1.6
Target Penetration (ft): 7.3
Actual Penetration (ft): 7.3
Recovered Core Length (ft): 6.1

Log of Station ID: A2-Attempt 2

Additional Notes: Z-layer sampled between 5.6' to 6.1', core samples collected from Attempt 2 because Z layer reviewed

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 12:56

Latitude: 33°45.654'
Longitude: -118°16.008'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 35.2

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
5.0 – 6.0		Fine grained Sand	Olive Gray	5Y 4/2	None	Z layer from 5.6' to 6.1'
6.0 – 10.0						No refusal

Water Depth (ft): 36.8
Tide (ft): +1.6
Target Penetration (ft): 7.3
Actual Penetration (ft): 7.3
Recovered Core Length (ft): 6.1

Log of Station ID: A2-Attempt 2

Additional Notes: Z-layer sampled between 5.6' to 6.1', core samples collected from Attempt 2 because Z layer reviewed

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 13:45

Latitude: 33°45.654'
Longitude: -118°16.008'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 34.8

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0 – 4.0		Sandy Silt	Very Dark Greenish-gray	5GY 3/1	Slight Organic Odor	Lots of shell hash at surface, decreases with increased depth Proportion of sand increases at 2.8'
4.0 – 5.0		Fine grained Sand	Olive Gray	5Y 4/2	None	Appears to be clean/native

Water Depth (ft): 36.5
Tide (ft): +1.7
Target Penetration (ft): 7.7
Actual Penetration (ft): 7.7
Recovered Core Length (ft): 6.5

Log of Station ID: A2-Attempt 3

Additional Notes: Z-layer added to composite from 6.0' to 6.5'

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 13:45

Latitude: 33°45.654'
Longitude: -118°16.008'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 34.8

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
5.0		Fine grained Sand	Olive Gray	5Y 4/2	None	
5.5						
6.0						Z-layer from 6.0' to 6.5'
6.5						Refusal not met
7.0						
7.5						
8.0						
8.5						
9.0						
9.5						
10.0						

Water Depth (ft): 36.5
Tide (ft): +1.7
Target Penetration (ft): 7.7
Actual Penetration (ft): 7.7
Recovered Core Length (ft): 6.5

Log of Station ID: A2-Attempt 3

Additional Notes: Z-layer added to composite from 6.0' to 6.5'

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 09:51

Latitude: 33°45.620'
Longitude: -118°16.040'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 38.0

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0 – 3.0		Sandy Silt	Greenish-black	5GY 2.5/1	Slight Organic & Hydrocarbon Odor	With shell hash Shell hash decreases below 1.0'
3.0 – 4.2		Fine grained Sand	Olive Gray	5Y 4/2	None	Appears clean/native Z-layer from 3.7' to 4.2'

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Water Depth (ft): 41.0
Tide (ft): +3.0
Target Penetration (ft): 4.5
Actual Penetration (ft): 4.5
Recovered Core Length (ft): 4.2

Log of Station ID: A3-Attempt 1

Additional Notes: No refusal, Z-layer collected from 3.7' to 4.2'

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 10:15

Latitude: 33°45.620'
Longitude: -118°16.040'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 39.7

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0 – 2.3		Sandy Silt	Greenish-black	5GY 2.5/1	Slight Organic & Hydrocarbon Odor	With shell hash Shell hash decreases at 1.5'

Water Depth (ft): 42.5
Tide (ft): +2.8
Target Penetration (ft): 2.8
Actual Penetration (ft): 1.5
Recovered Core Length (ft): 2.3

Log of Station ID: A3-Attempt 2

Additional Notes: Hit refusal, no Z-layer. Plug fell out into water upon retrieval.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 10:30

Latitude: 33°45.620'
Longitude: -118°16.040'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 34.5

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0		Sandy Silt with Clay	Very Dark Greenish-gray	5GY 3/1	Slight to Strong Hydrocarbon Odor with Organics	Sheen along outside of core & in water notably at 1.7' to 4.0'
1.5			Gray	10GY 3/1		
2.5			Very Dark Greenish-gray	5GY 3/1		Concrentrated sheen between 2.7' to 3.0' & 3.6' to 4.0' on outside of core Material is sticky With shell hash, shell hash decreases after 3.3'
4.0			Greenish-black	5GY 2.5/1		
5.0						

Water Depth (ft): 37.2
Tide (ft): +2.7
Target Penetration (ft): 8.0
Actual Penetration (ft): 6.8
Recovered Core Length (ft): 6.3

Log of Station ID: A3-Attempt 3

Additional Notes: No Z-layer; hit refusal. Plug looks like clean/native sand similar to Attempt 1
Z-layer. Core collected on very steep slope (A) collected of core to 5.8', A3-A & 5.8' to 6.3' A3-B.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 10:30

Latitude: 33°45.620'
Longitude: -118°16.040'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 34.5

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
5.0		Sandy Silt with Clay	Greenish-black	5GY 2.5/1		
5.5						
		Fine grained Sand	Olive Gray	5Y 4/2	None	No shell hash after 5.8'
6.0						
						Refusal at 41.3' MLLW
6.5						
7.0						
7.5						
8.0						
8.5						
9.0						
9.5						
10.0						

Water Depth (ft): 37.2
Tide (ft): +2.7
Target Penetration (ft): 8.0
Actual Penetration (ft): 6.8
Recovered Core Length (ft): 6.3

Log of Station ID: A3-Attempt 3

Additional Notes: No Z-layer; hit refusal. Plug looks like clean/native sand similar to Attempt 1 Z-layer. Core collected on very steep slope (A) collected of core to 5.8', A3-A & 5.8' to 6.3' A3-B.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/6/2013 **Time:** 08:46

Latitude: 33°45.604'
Longitude: -118°16.055'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 37.9

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0		Sandy Silt	Very Dark Greenish-gray	5GY 3/1	None	Unconsolidated & watery from 0.0 to 0.5'
0.5						
1.0						Lots of shell hash throughout core (mussels)
1.5						
2.0					Organic Odor	
2.5						
3.0						
3.5						
4.0						
4.5						Z-layer from 4.4' to 4.9'
5.0						

Water Depth (ft): 41.2
Tide (ft): +3.3
Target Penetration (ft): 4.6
Actual Penetration (ft): 4.6
Recovered Core Length (ft): 4.9

Log of Station ID: A4-Attempt 1

Additional Notes: No plug, core expanded upon extraction due to unconsolidated section at top 4.4' to 4.9' sampled for Z-layer.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/6/2013 **Time:** 09:07

Latitude: 33°45.604'
Longitude: -118°16.055'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 36.0

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0		Sandy Silt	Very Dark Greenish-gray	5GY 3/1	Organic & Strong Hyrdocarbon Odor	Sheen on outside of core in water upon opening Shell hash throughout
0.5						
1.0						
1.5						Wood fragments (creosote ?) at 1.7'
2.0						
2.5						
		Sandy Silt with Clay				Core is more consolidated & sticky at 2.7'
3.0						
3.5						
4.0						
4.5		Silty Sand	Very Dark Gray			Asphalt or tar, very strong hydrocarbon odor
		Sandy Silt with Clay	Very Dark Greenish-gray	5GY 3/1		
5.0						

Water Depth (ft): 39.5
Tide (ft): +3.5
Target Penetration (ft): 6.5
Actual Penetration (ft): 5.5
Recovered Core Length (ft): 5.4

Log of Station ID: A4-Attempt 2

Additional Notes: Sampling on sideslope. Core began to tip during penetration.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/6/2013 **Time:** 09:07

Latitude: 33°45.604'
Longitude: -118°16.055'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 36.0

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
5.0		Sandy Silt with Clay	Very Dark Greenish-gray	5GY 3/1	Organic & Strong Hyrdocarbon Odor	
5.5						Refusal at 41.5' MLLW
6.0						
6.5						
7.0						
7.5						
8.0						
8.5						
9.0						
9.5						
10.0						

Water Depth (ft): 39.5
Tide (ft): +3.5
Target Penetration (ft): 6.5
Actual Penetration (ft): 5.5
Recovered Core Length (ft): 5.4

Log of Station ID: A4-Attempt 2

Additional Notes: Sampling on sideslope. Core began to tip during penetration.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 14:32

Latitude: 33°45.551'
Longitude: -118°16.079'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 39.0

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0		Sandy Silt with Clay	Very Dark Greenish-gray	5GY 3/1	Slight organic/ hydrocarbon Odor	With shell hash, core is sticky Core is sticky
0.5						
1.0						
1.5						Piece of bambo at 1.5' Dark streak looks like bryozoan shell
2.0						
2.5						
3.0						At 2.9' sheen leaked out of core when sampling just above/in "Z-layer" Z-Layer from 3.0' to 3.5' Z-layer from 3.25' to 3.5'
3.5						Not sampled
4.0						
4.5		Silty Sand with Clay				
5.0						

Water Depth (ft): 41.0
Tide (ft): +2.0
Target Penetration (ft): 3.5
Actual Penetration (ft): 4.7
Recovered Core Length (ft): 4.7

Log of Station ID: A5-Attempt 1

Additional Notes: Plug is soft material, lost collected samples from Attempt 1.

Project Number: 1015101930
Project Manager: Barry Snyder
Logged and Sampled By: KG/TH
Sample Type: Vibracore
Date: 6/4/2013 **Time:** 14:52

Latitude: 33°45.551'
Longitude: -118°16.079'
Project Depth (ft MLLW): -42.5
Mudline Elevation (ft MLLW): 38.0

Depth in Feet	Lithology	Sediment Description	Color	Munsell Color Notation	Odor	Remarks
0.0 – 3.5		Sandy Silt with Clay	Very Dark Greenish-gray	5GY 3/1	Slight Organic & Hydrocarbon Odor	Sheen on outside of core, spread through sample Top is watery Core is sticky With shell hash, shells decreased with increase in depth Dark streaking between 1.9' to 3.5'
3.5 – 5.0						No refusal

Water Depth (ft): 40.2
Tide (ft): +2.2
Target Penetration (ft): 4.5
Actual Penetration (ft): 4.5
Recovered Core Length (ft): 3.5

Log of Station ID: A5-Attempt 2

Additional Notes: Plug is soft.

APPENDIX B

PHOTOGRAPHS OF CORES

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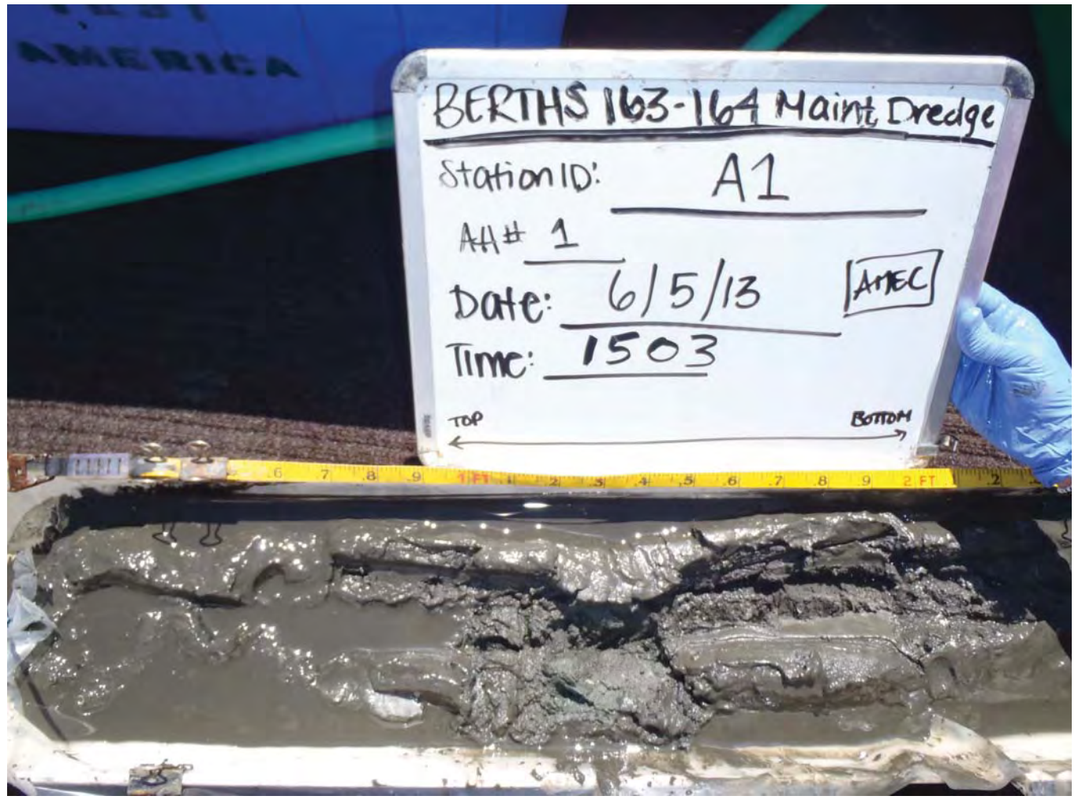
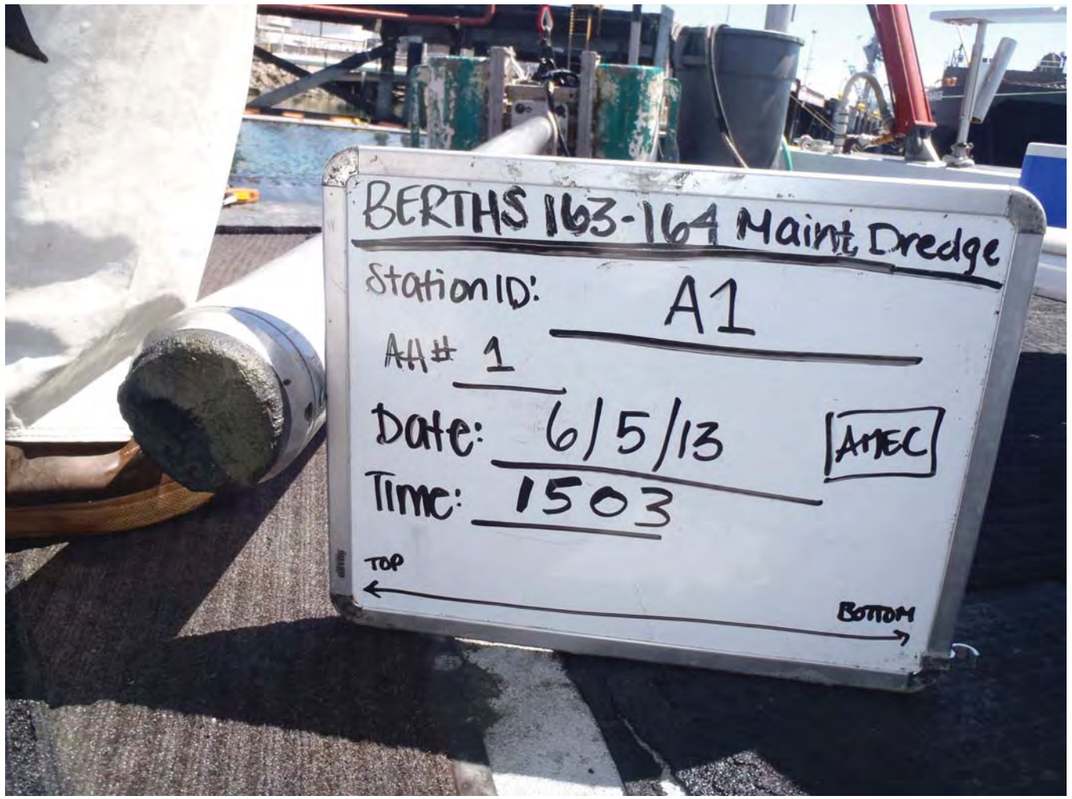


Location: POLA Berths 163 - 164
Sample ID: A1
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1503

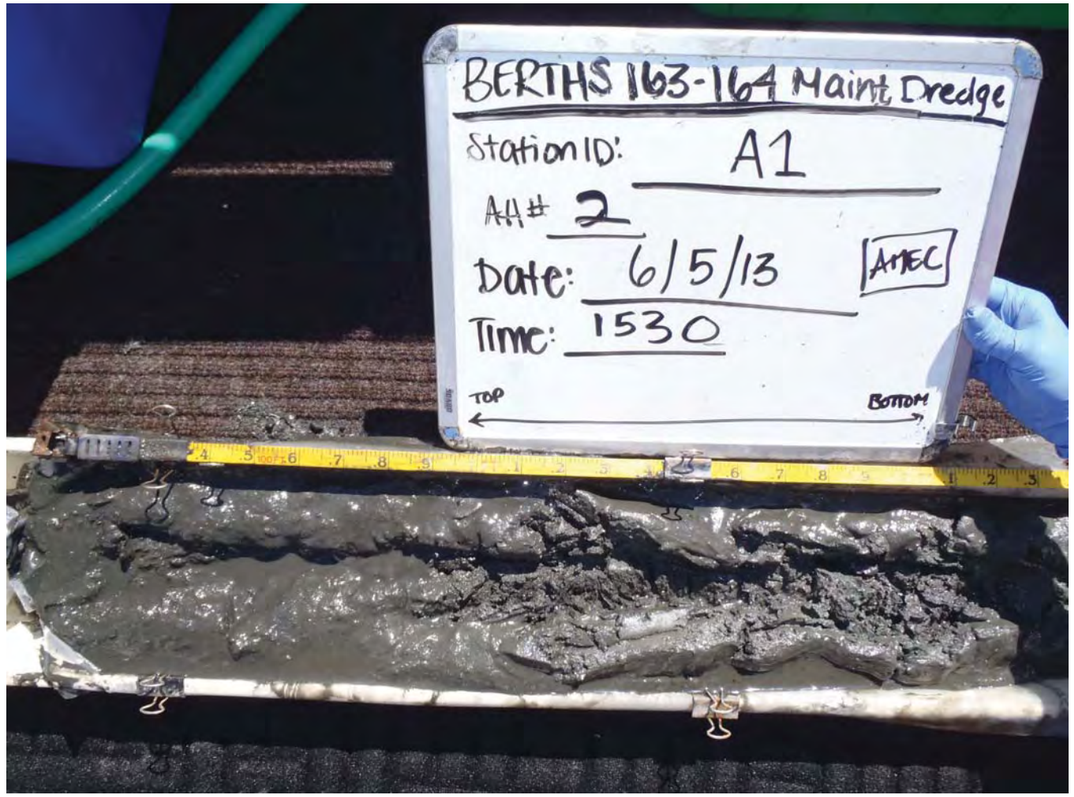
Location: POLA Berths 163 - 164
Sample ID: A1
Attempt #: 1
Core Length: 2.0 - 4.2 ft.
Sample Date & Time: 06/05/2013 1503

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: A1
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/05/2013 1503

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

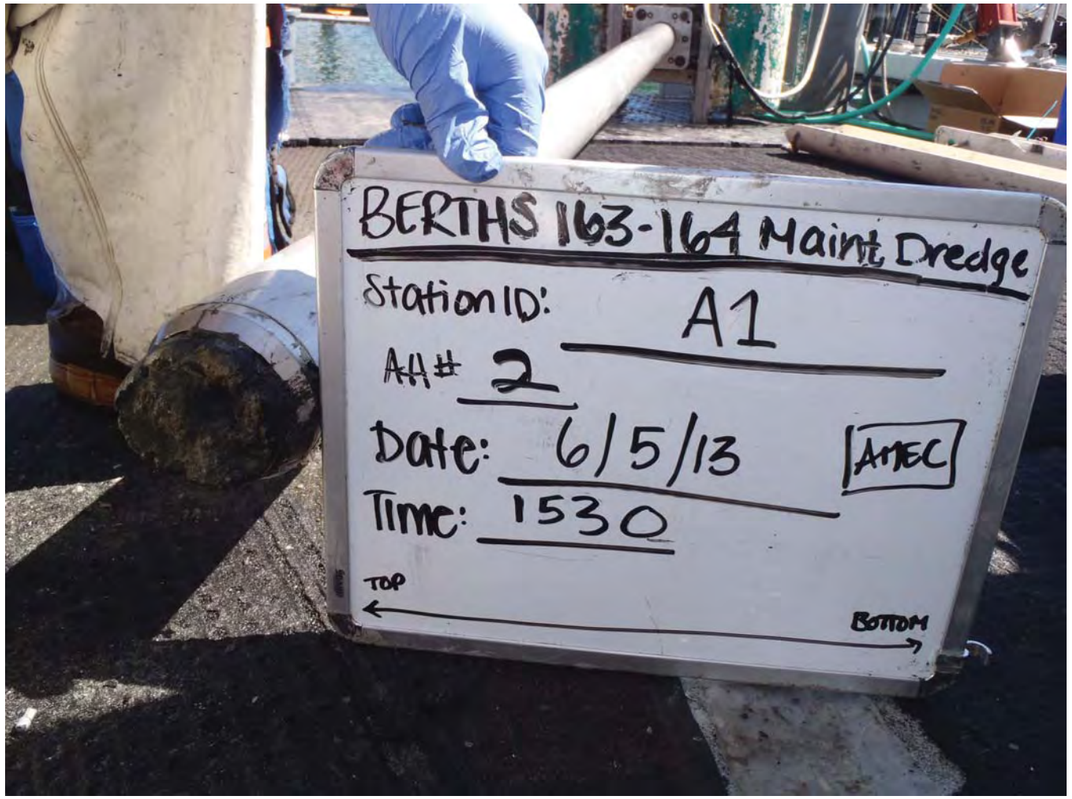


Location: POLA Berths 163 - 164
Sample ID: A1
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1530

Location: POLA Berths 163 - 164
Sample ID: A1
Attempt #: 2
Core Length: 1.0 - 3.2 ft.
Sample Date & Time: 06/05/2013 1530

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_3.ai



Location: POLA Berths 163 - 164
Sample ID: A1
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/05/2013 1530

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

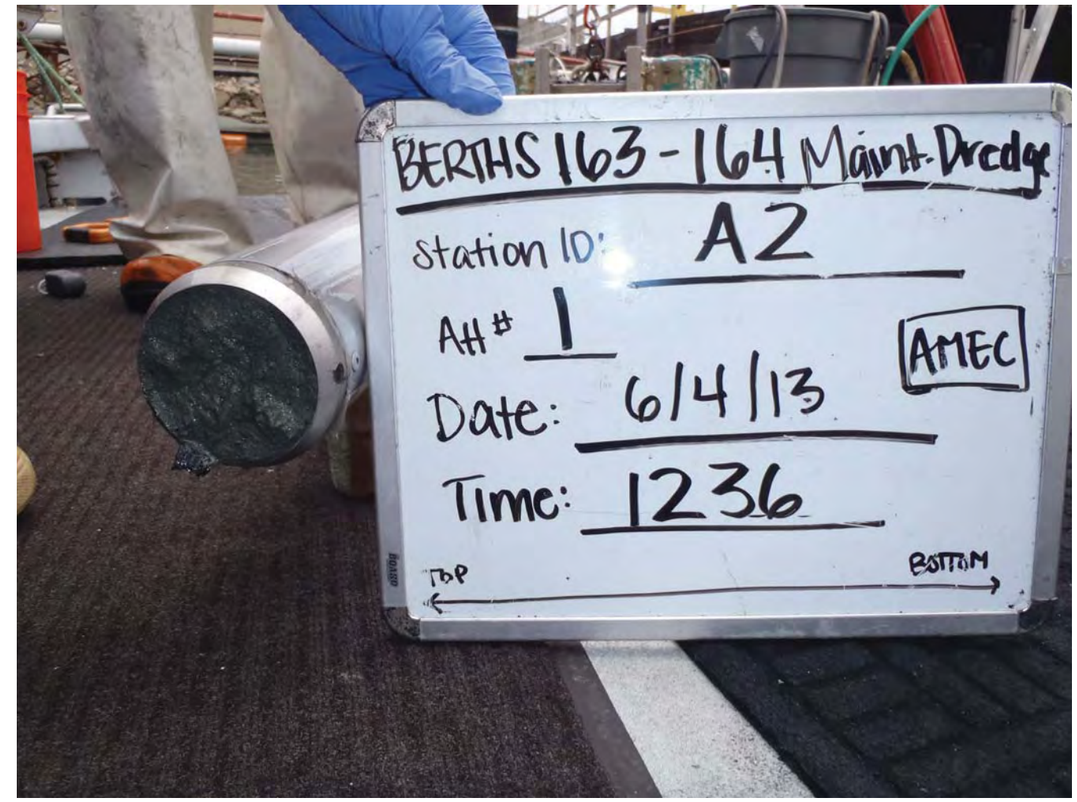
Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_4.ai

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/04/2013 1236

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 1
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/04/2013 1236

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 1
Core Length: 4.0 - 6.1 ft.
Sample Date & Time: 06/04/2013 1236



Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/04/2013 1236

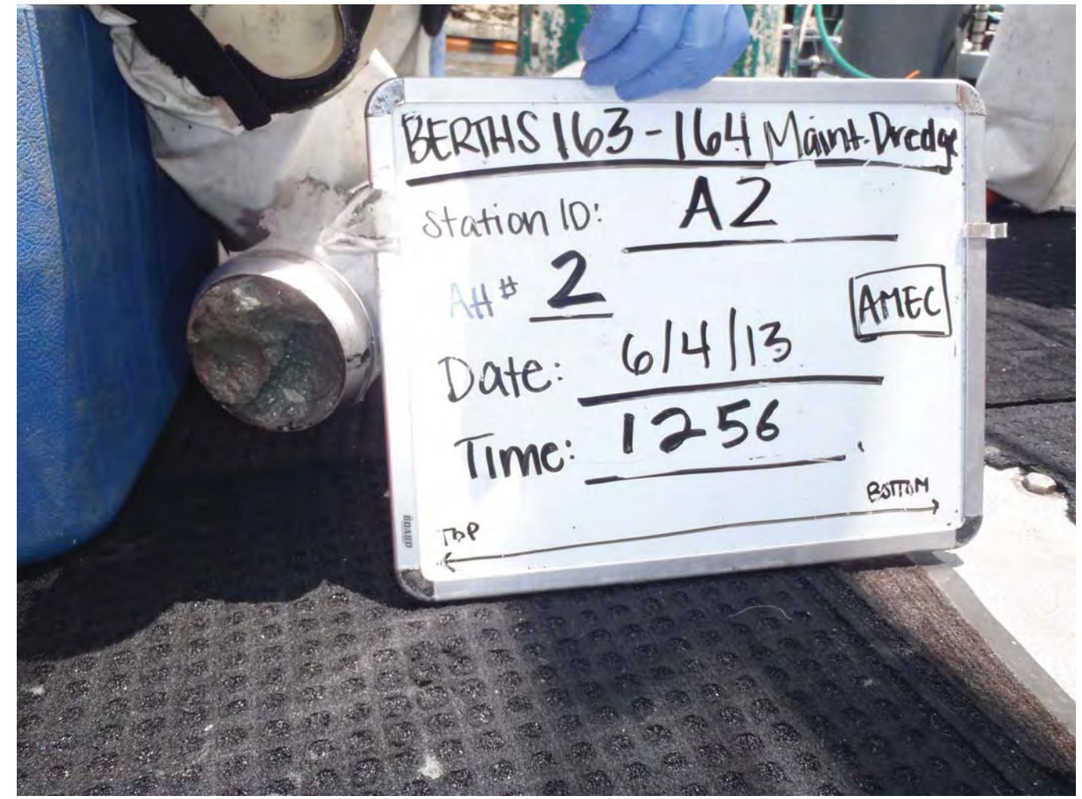
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/04/2013 1256

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 2
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/04/2013 1256

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 2
Core Length: 4.0 - 6.1 ft.
Sample Date & Time: 06/04/2013 1256



Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/04/2013 1256

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

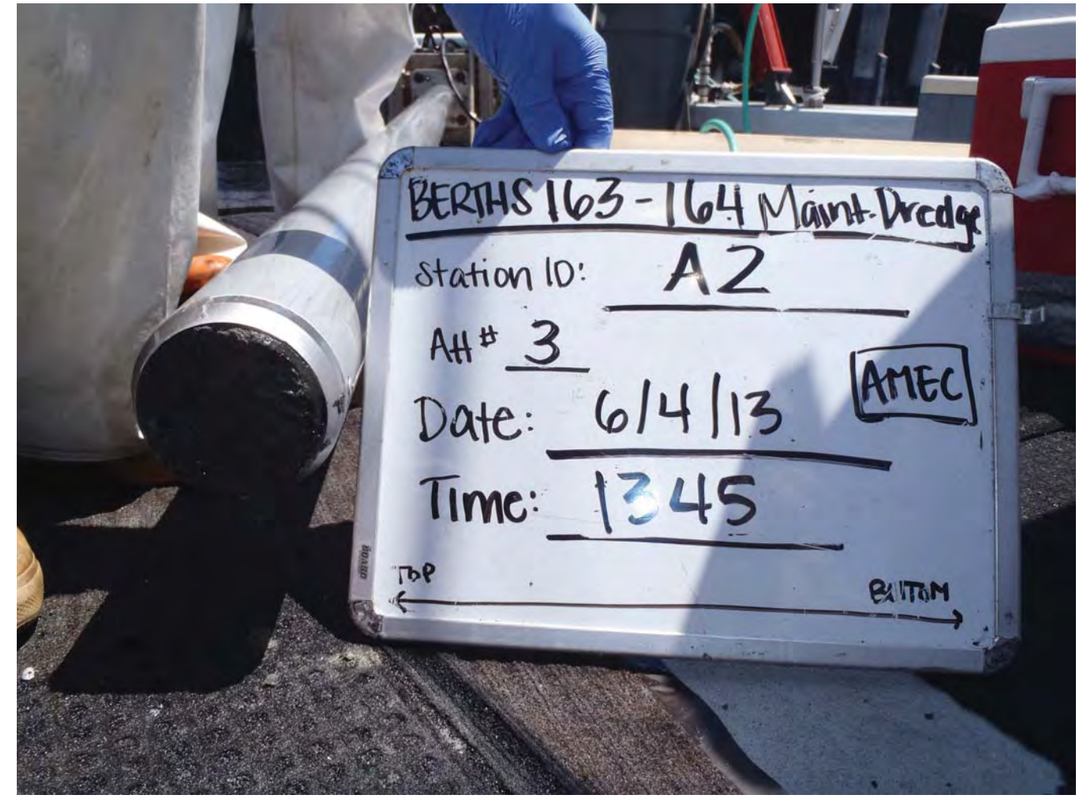
Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 3
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/04/2013 1345

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 3
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/04/2013 1345

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_9.ai

Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 3
Core Length: 4.0 - 6.5 ft.
Sample Date & Time: 06/04/2013 1345



Location: POLA Berths 163 - 164
Sample ID: A2
Attempt #: 3
Core Length: Plug
Sample Date & Time: 06/04/2013 1345

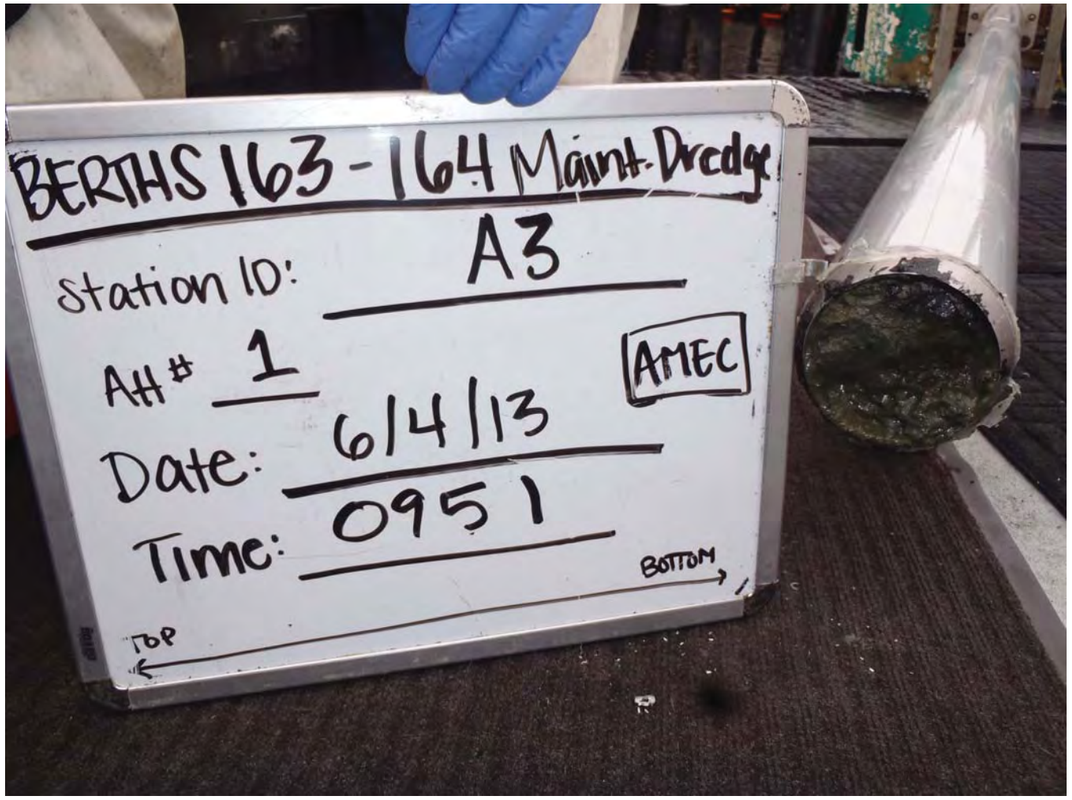
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/04/2013 0951

Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 1
Core Length: 2.0 - 4.2 ft.
Sample Date & Time: 06/04/2013 0951

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

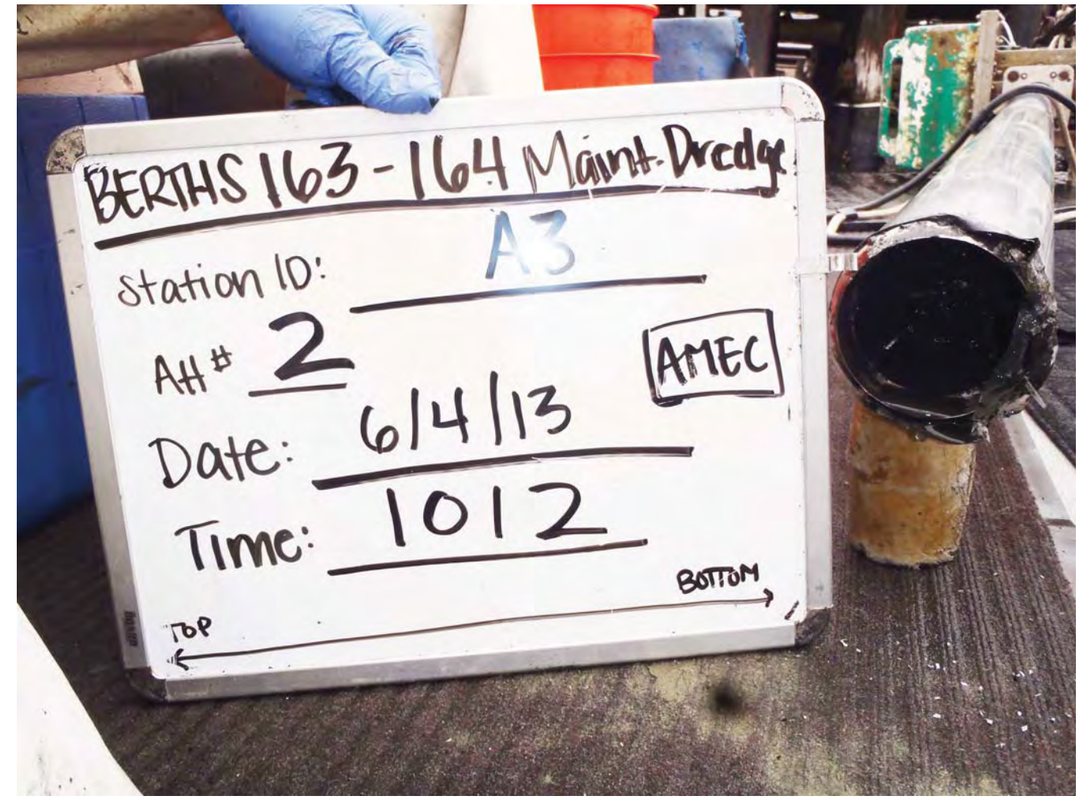
Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_11.ai



Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/04/2013 0951

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 2
Core Length: 0 - 2.3 ft.
Sample Date & Time: 06/04/2013 1012



Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/04/2013 1012

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
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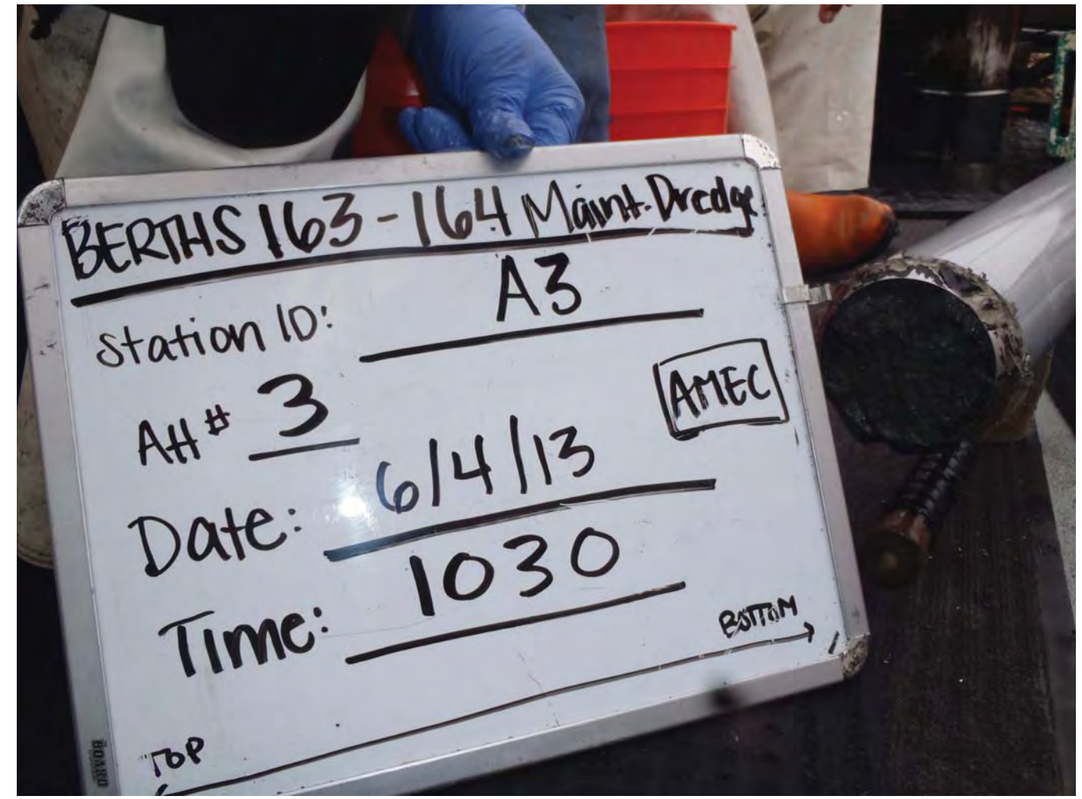
Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 3
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/04/2013 1030

Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 3
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/04/2013 1030

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 3
Core Length: 4.0 - 6.3 ft.
Sample Date & Time: 06/04/2013 1030



Location: POLA Berths 163 - 164
Sample ID: A3
Attempt #: 3
Core Length: Plug
Sample Date & Time: 06/04/2013 1030

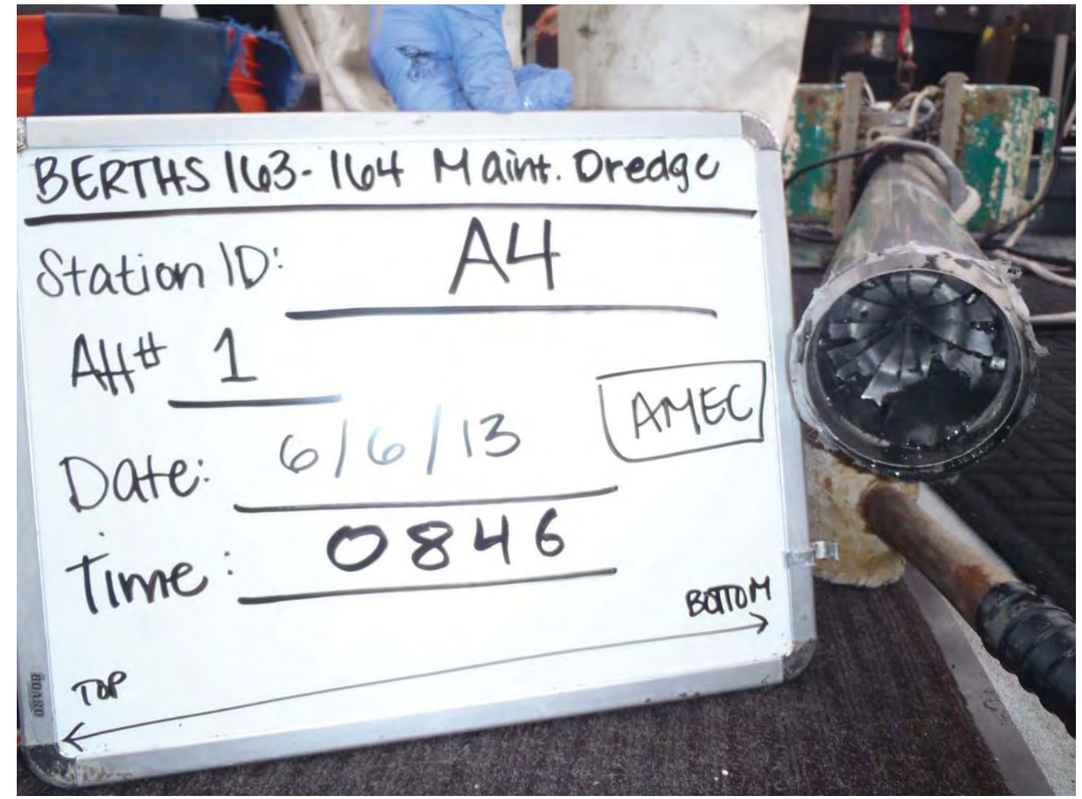
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/06/2013 0846

Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 1
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/06/2013 0846

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 1
Core Length: 3.0 - 4.9 ft.
Sample Date & Time: 06/06/2013 0846



Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/06/2013 0846

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_17.ai

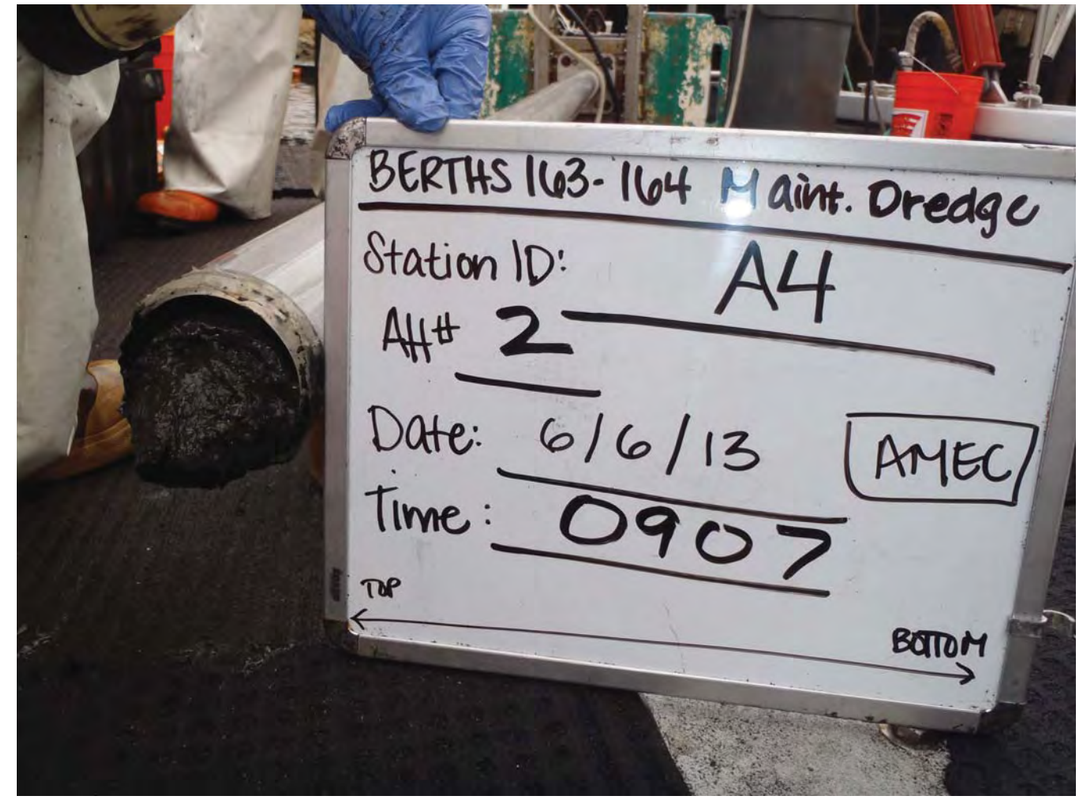
Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/06/2013 0907

Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 2
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/06/2013 0907

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_18.ai

Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 2
Core Length: 3.0 - 5.4 ft.
Sample Date & Time: 06/06/2013 0907



Location: POLA Berths 163 - 164
Sample ID: A4
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/06/2013 0907

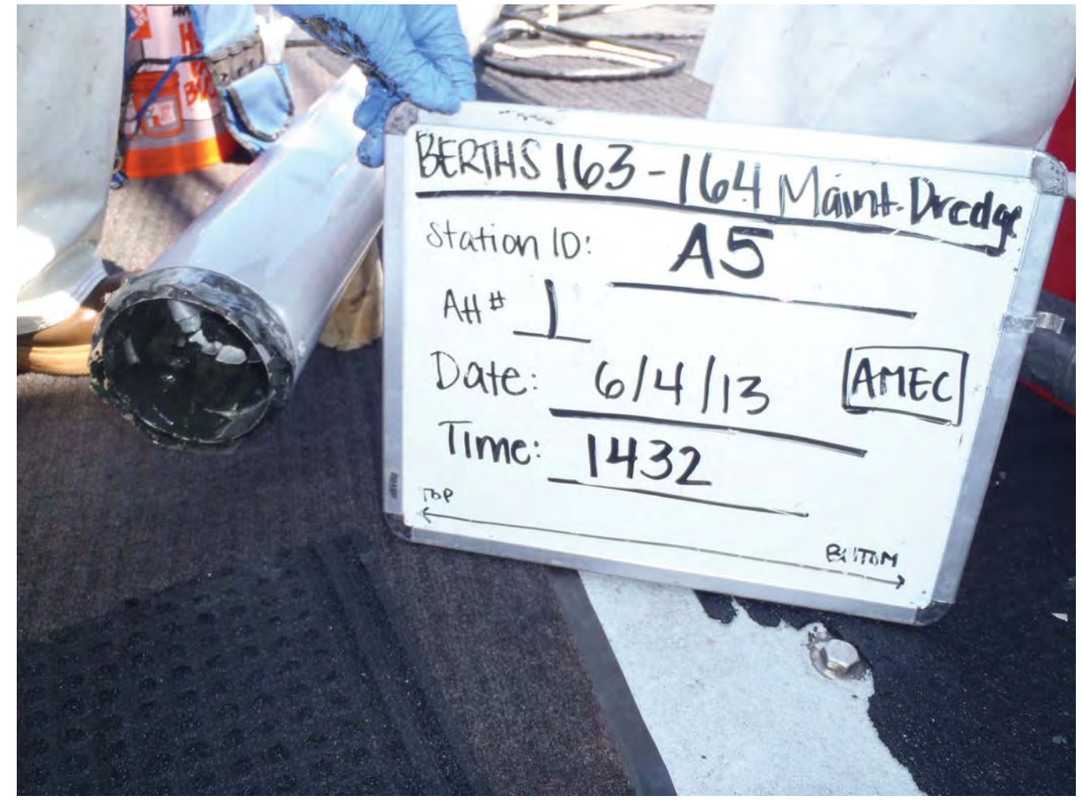
Location: POLA Berths 163 - 164
Sample ID: A5
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/04/2013 1432

Location: POLA Berths 163 - 164
Sample ID: A5
Attempt #: 1
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/04/2013 1432

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_20.ai

Location: POLA Berths 163 - 164
Sample ID: A5
Attempt #: 1
Core Length: 3 - 4.7 ft.
Sample Date & Time: 06/04/2013 1432



Location: POLA Berths 163 - 164
Sample ID: A5
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/04/2013 1432

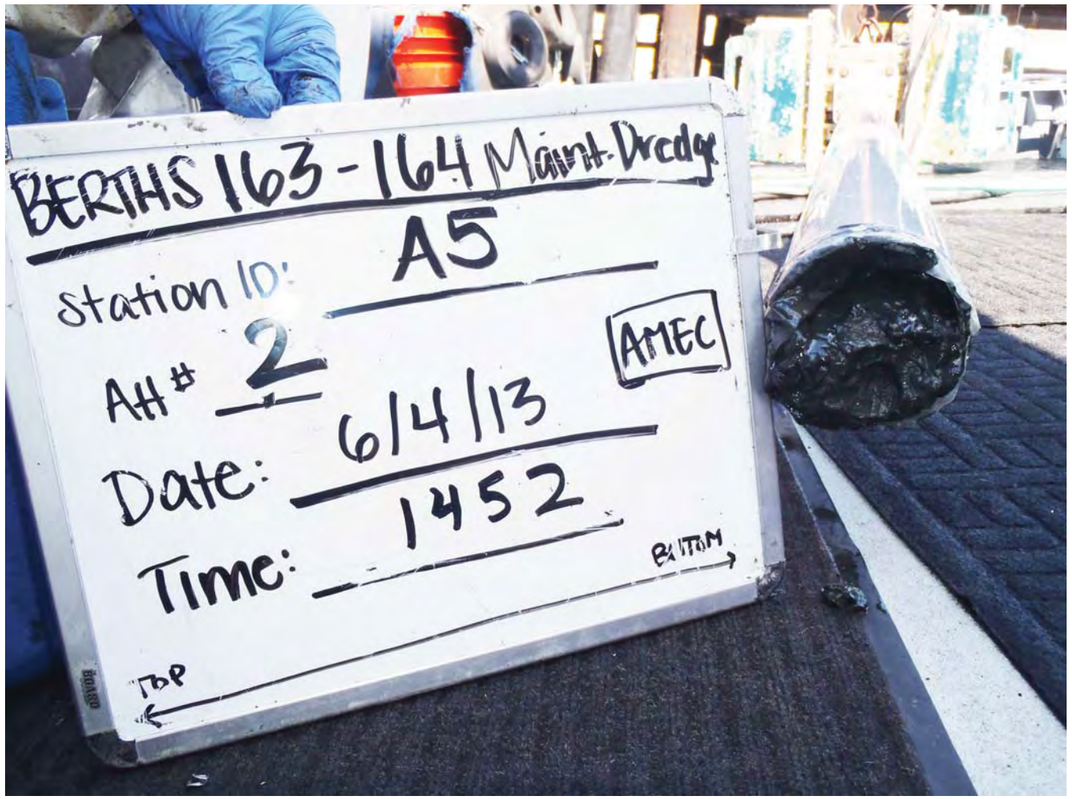
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: A5
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/04/2013 1452

Location: POLA Berths 163 - 164
Sample ID: A5
Attempt #: 2
Core Length: 1.5 - 3.5 ft.
Sample Date & Time: 06/04/2013 1452

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_22.ai



Location: POLA Berths 163 - 164
Sample ID: A5
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/04/2013 1452

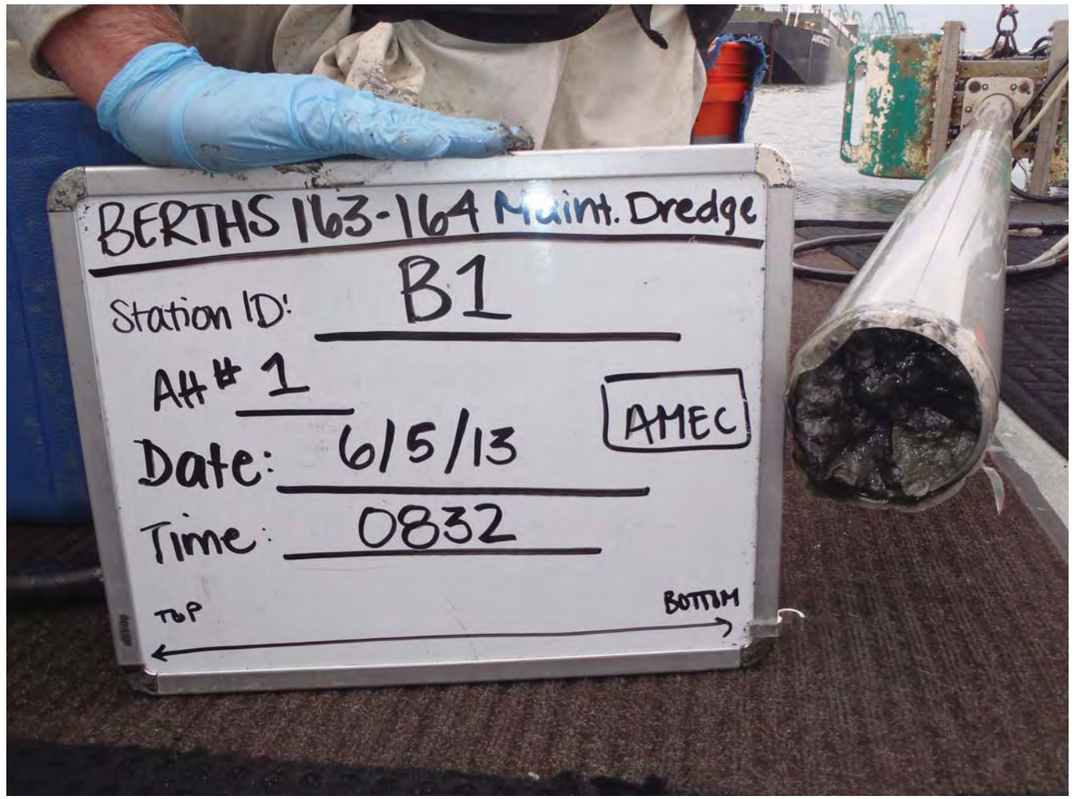
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_23.ai

Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 0832

Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 1
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/05/2013 0832

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/05/2013 0832

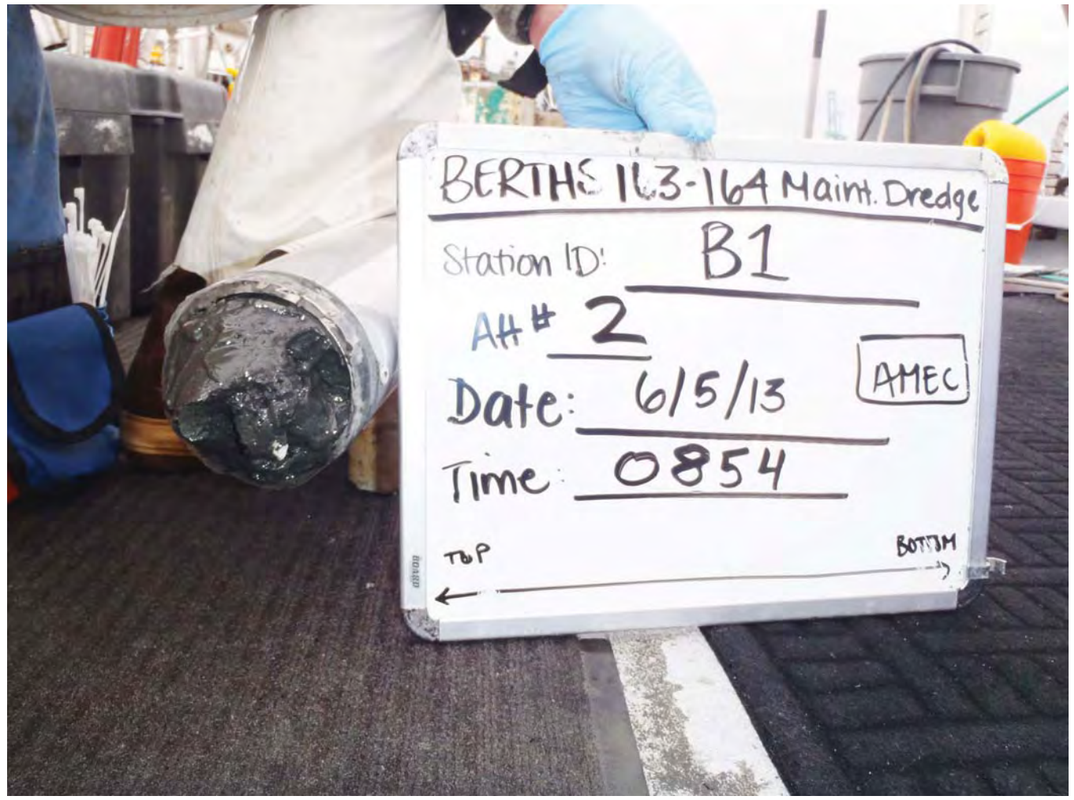
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_25.ai

Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 0854

Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 2
Core Length: 1.0 - 3.3 ft.
Sample Date & Time: 06/05/2013 0854

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/05/2013 0854

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 3
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 0937

Location: POLA Berths 163 - 164
Sample ID: B1
Attempt #: 3
Core Length: 1.5 - 3.5 ft.
Sample Date & Time: 06/05/2013 0937

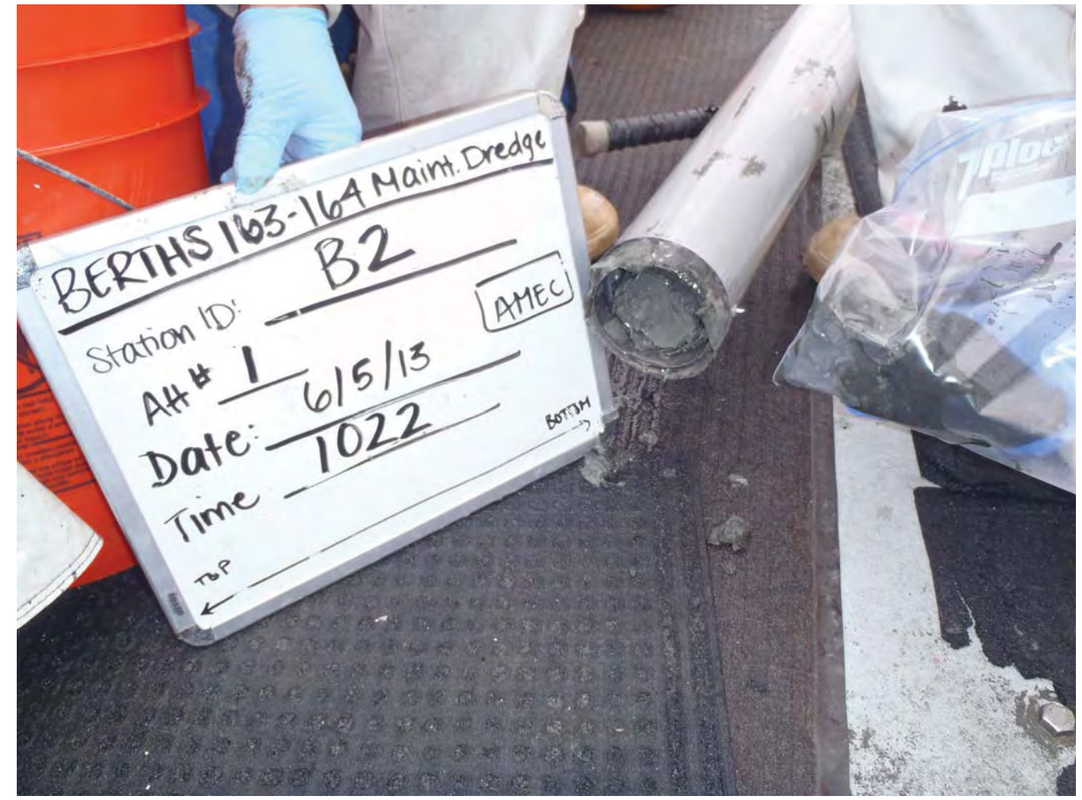
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1022

Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 1
Core Length: 2.0 - 4.0 ft.
Sample Date & Time: 06/05/2013 1022

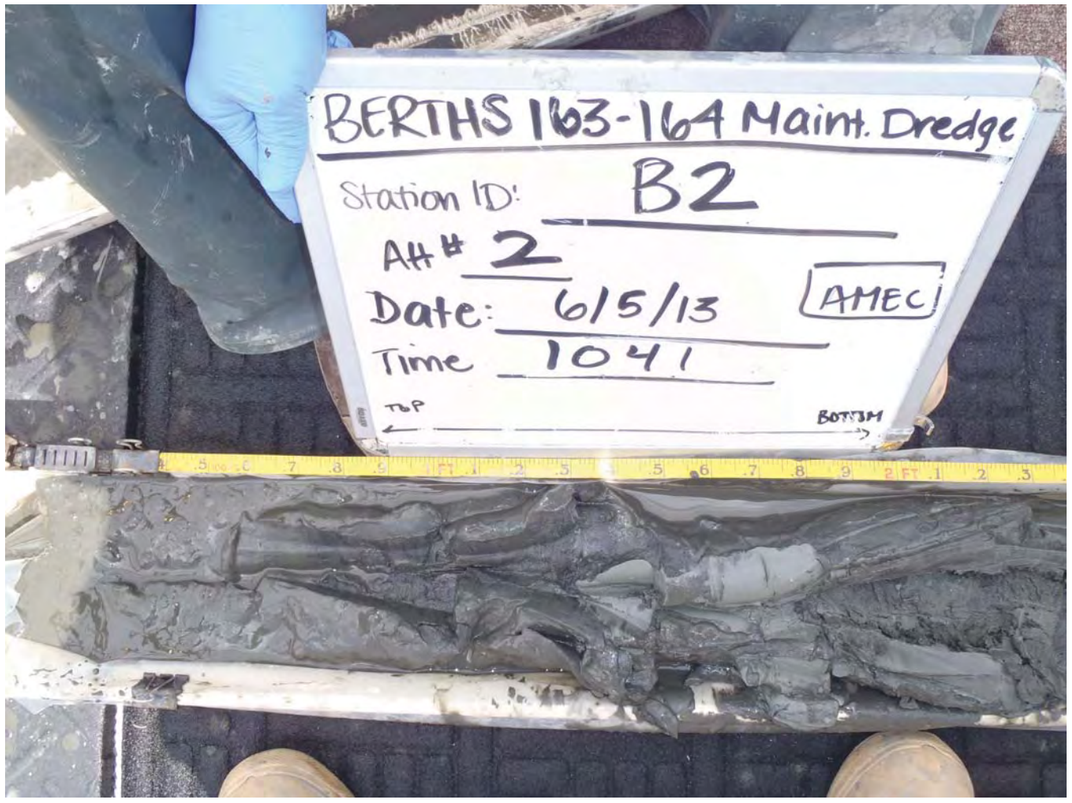
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 1
Core Length: 3.0 - 4.6 ft.
Sample Date & Time: 06/05/2013 1022



Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/05/2013 1022

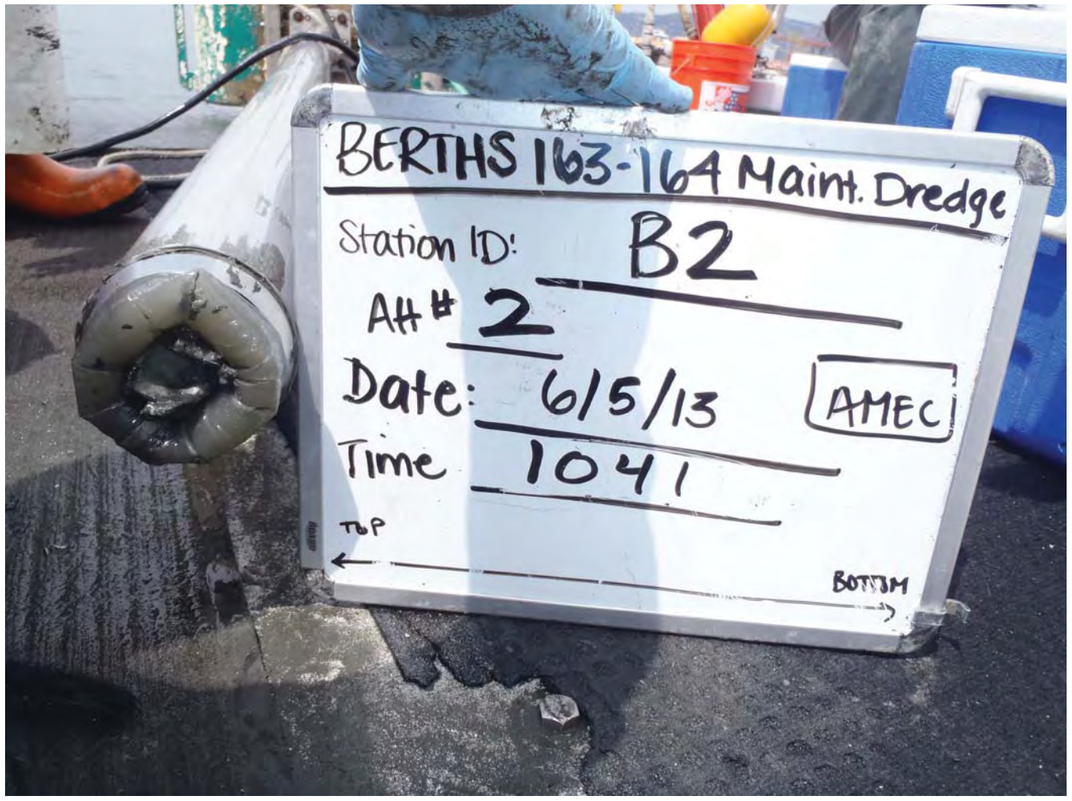
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1041

Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 2
Core Length: 2.0 - 4.1 ft.
Sample Date & Time: 06/05/2013 1041

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/05/2013 1041

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

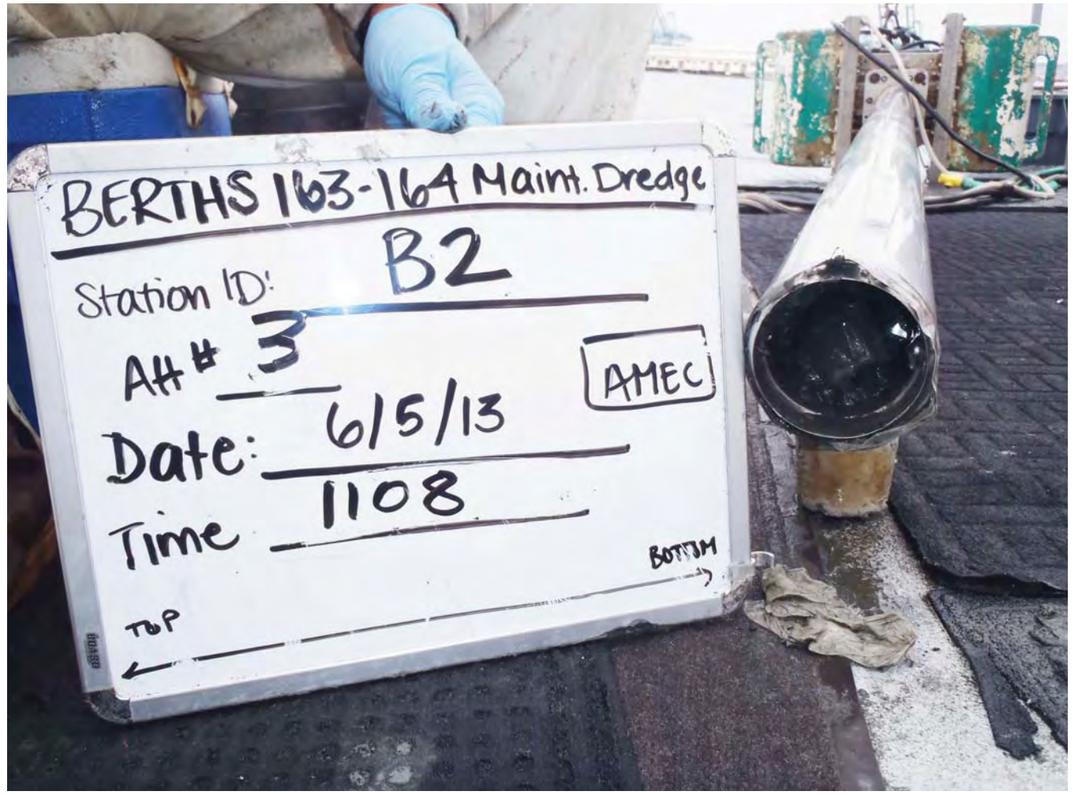
Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_32.ai

Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 3
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1108

Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 3
Core Length: 1.0 - 3.4 ft.
Sample Date & Time: 06/05/2013 1108

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

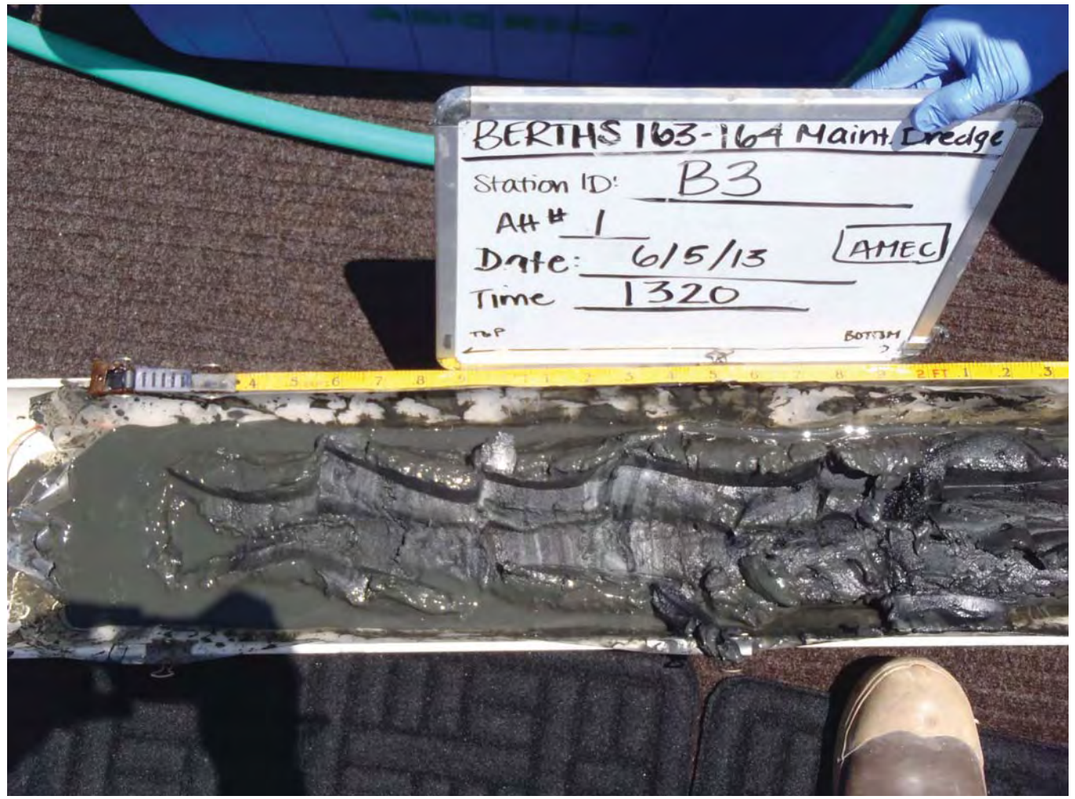
Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_33.ai



Location: POLA Berths 163 - 164
Sample ID: B2
Attempt #: 3
Core Length: Plug
Sample Date & Time: 06/05/2013 1108

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_34.ai



Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1320

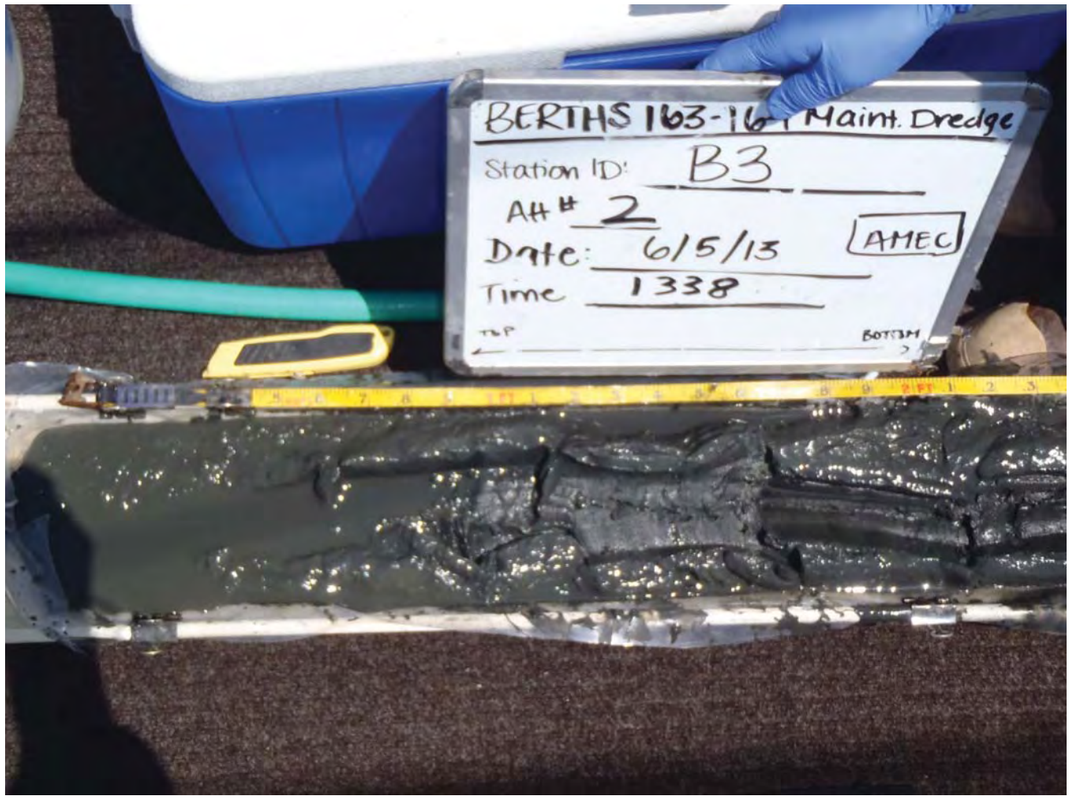
Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 1
Core Length: 2.0 - 3.9 ft.
Sample Date & Time: 06/05/2013 1320

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_35.ai

Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/05/2013 1320

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

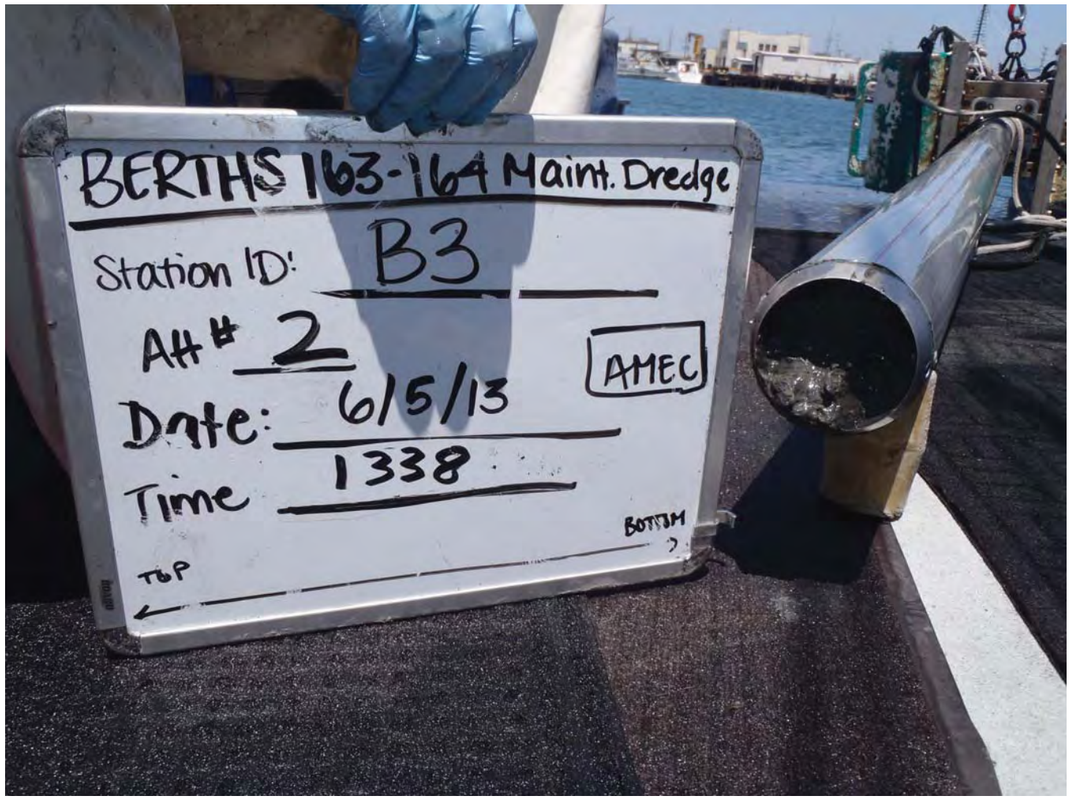


Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1338

Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 2
Core Length: 2.0 - 4.2 ft.
Sample Date & Time: 06/05/2013 1338

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_37.ai



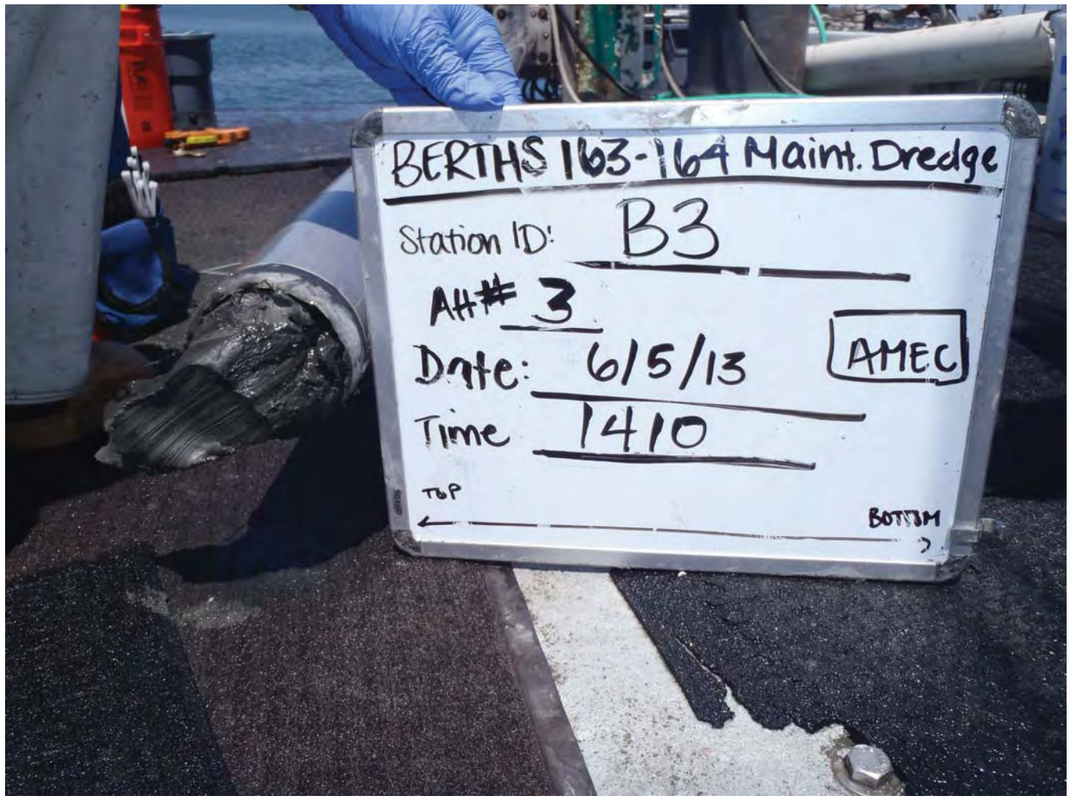
Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/05/2013 1338

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 3
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/05/2013 1410

Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 3
Core Length: 2.0 - 4.3 ft.
Sample Date & Time: 06/05/2013 1410

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: B3
Attempt #: 3
Core Length: Plug
Sample Date & Time: 06/05/2013 1410

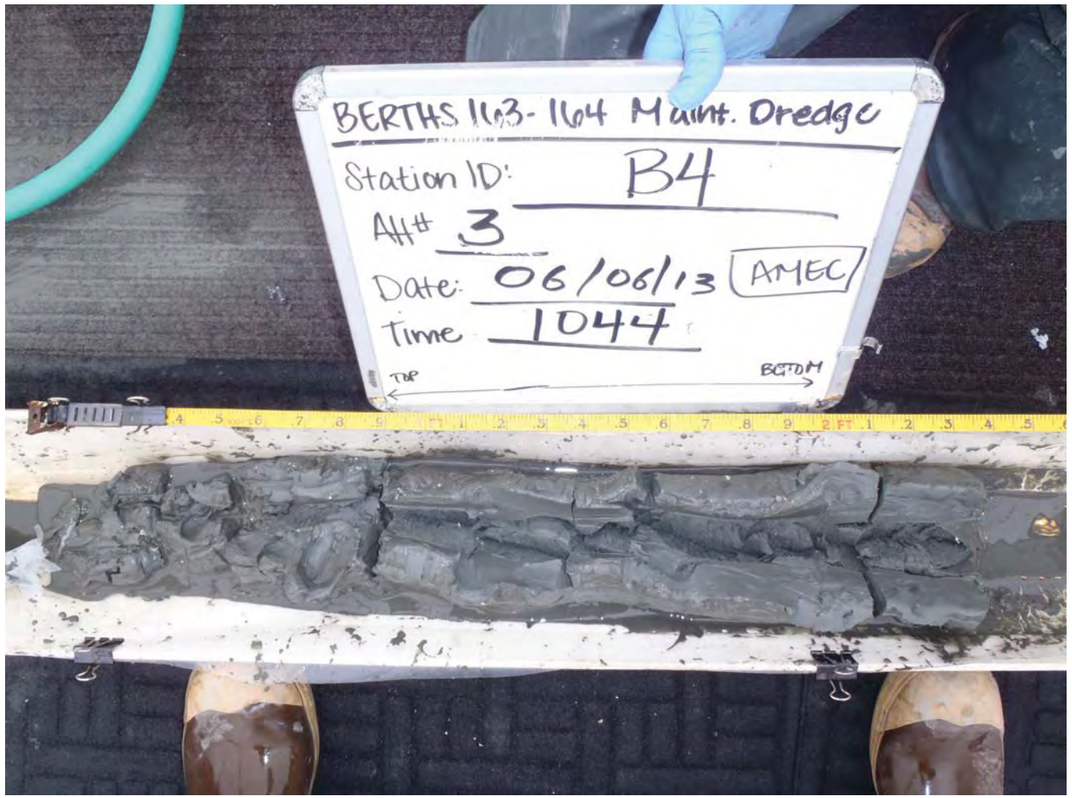
Location: POLA Berths 163 - 164
Sample ID: B4
Attempt #: 1
Core Length: 0 - 2.5 ft.
Sample Date & Time: 06/06/2013 1004

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_41.ai

Location: POLA Berths 163 - 164
Sample ID: B4
Attempt #: 2
Core Length: 0 - 2.4 ft.
Sample Date & Time: 06/06/2013 1026

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: B4
Attempt #: 3
Core Length: 0 - 2.5 ft.
Sample Date & Time: 06/06/2013 1044

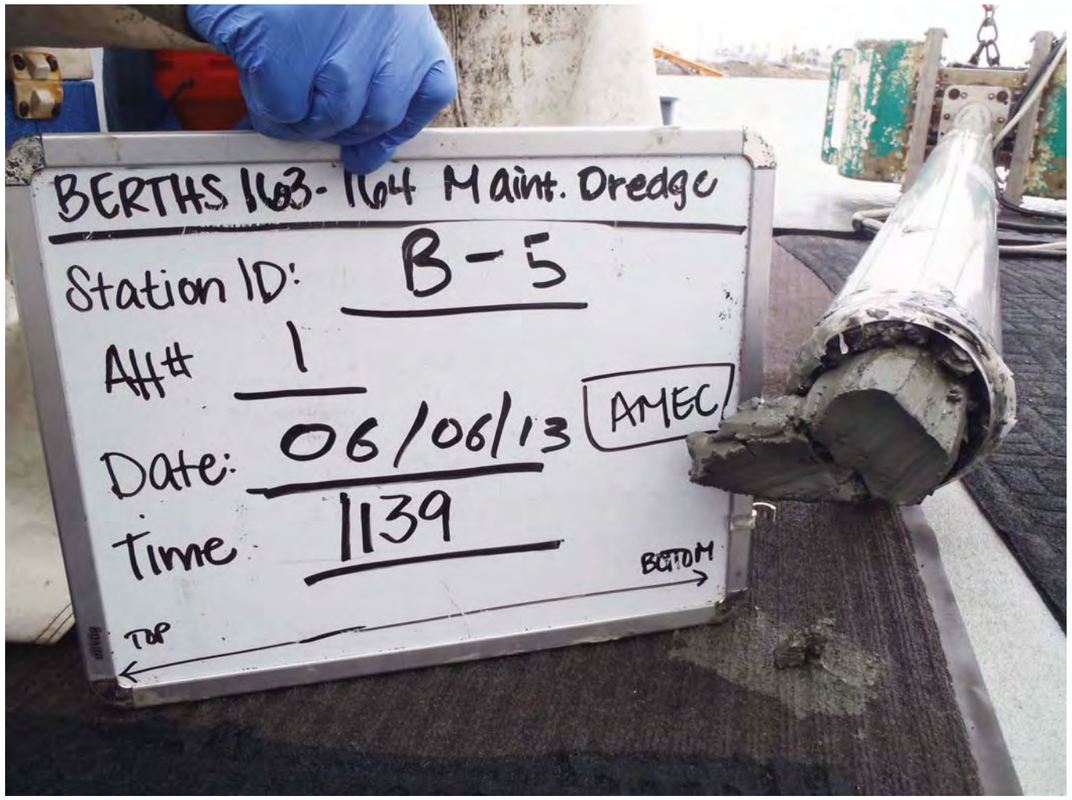
Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

Graphics/AquaticSciences/POLA Berths 163-164/B163-164_Sampling_44.ai

Location: POLA Berths 163 - 164
Sample ID: B5
Attempt #: 1
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/06/2013 1139

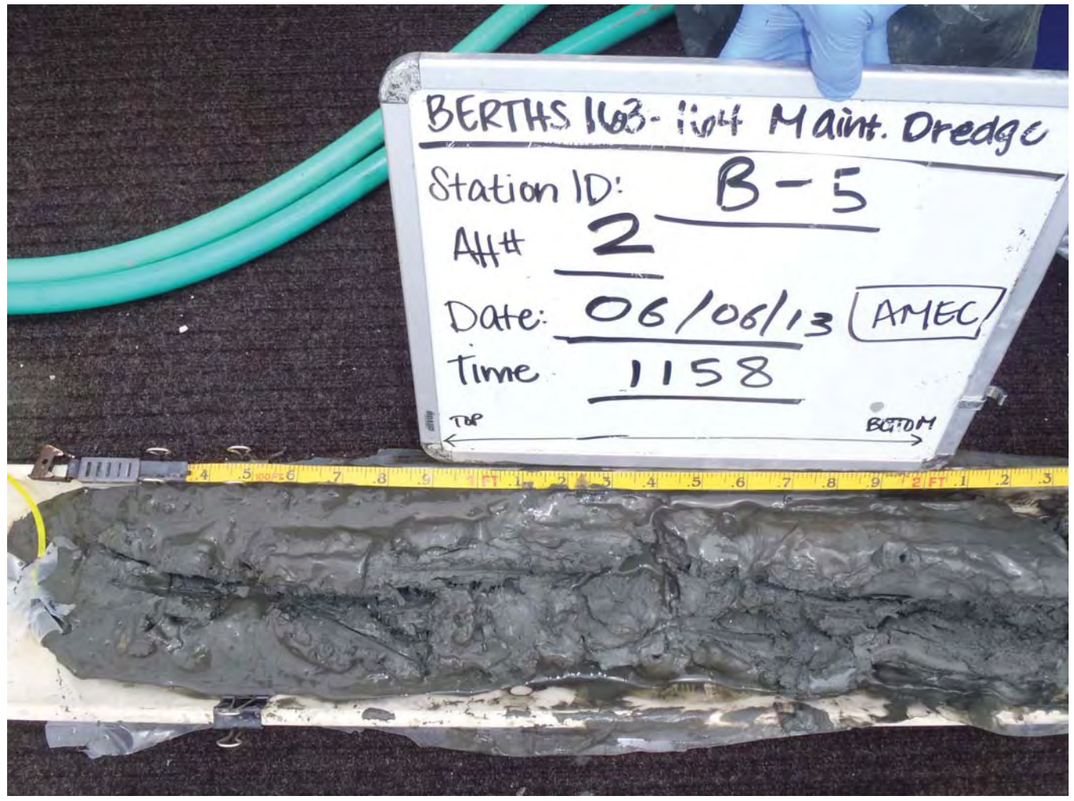
Location: POLA Berths 163 - 164
Sample ID: B5
Attempt #: 1
Core Length: 1 - 2.9 ft.
Sample Date & Time: 06/06/2013 1139

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

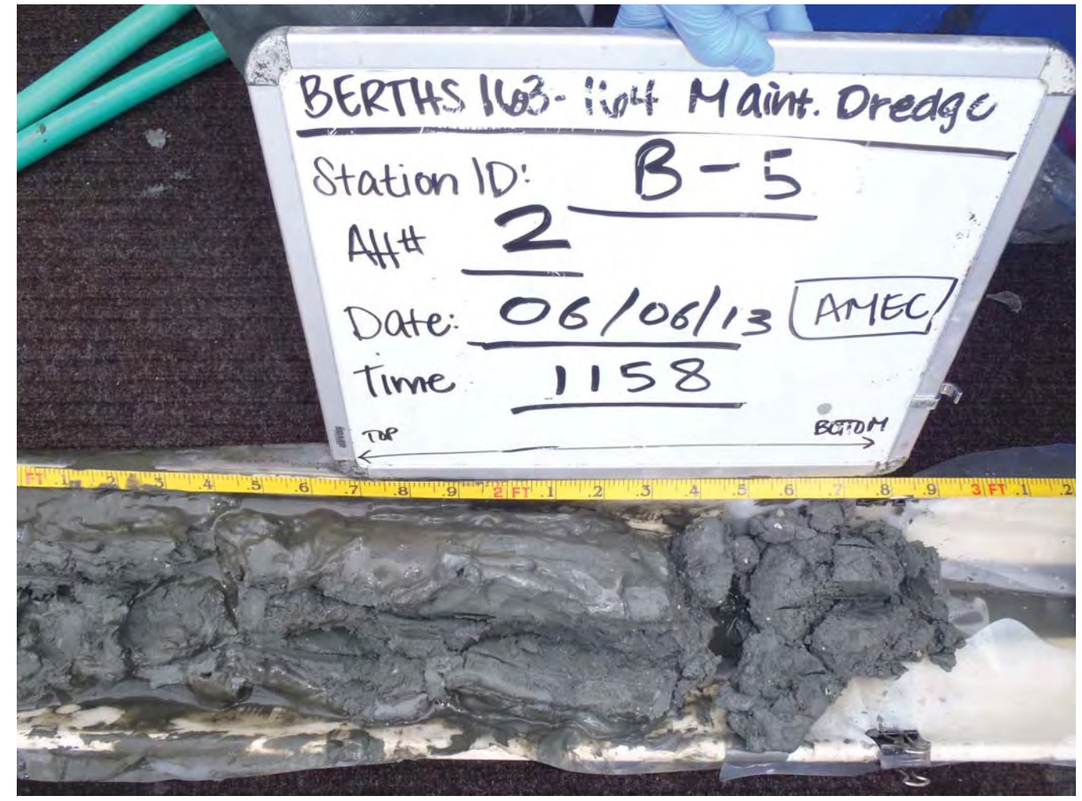


Location: POLA Berths 163 - 164
Sample ID: B5
Attempt #: 1
Core Length: Plug
Sample Date & Time: 06/06/2013 1139

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013

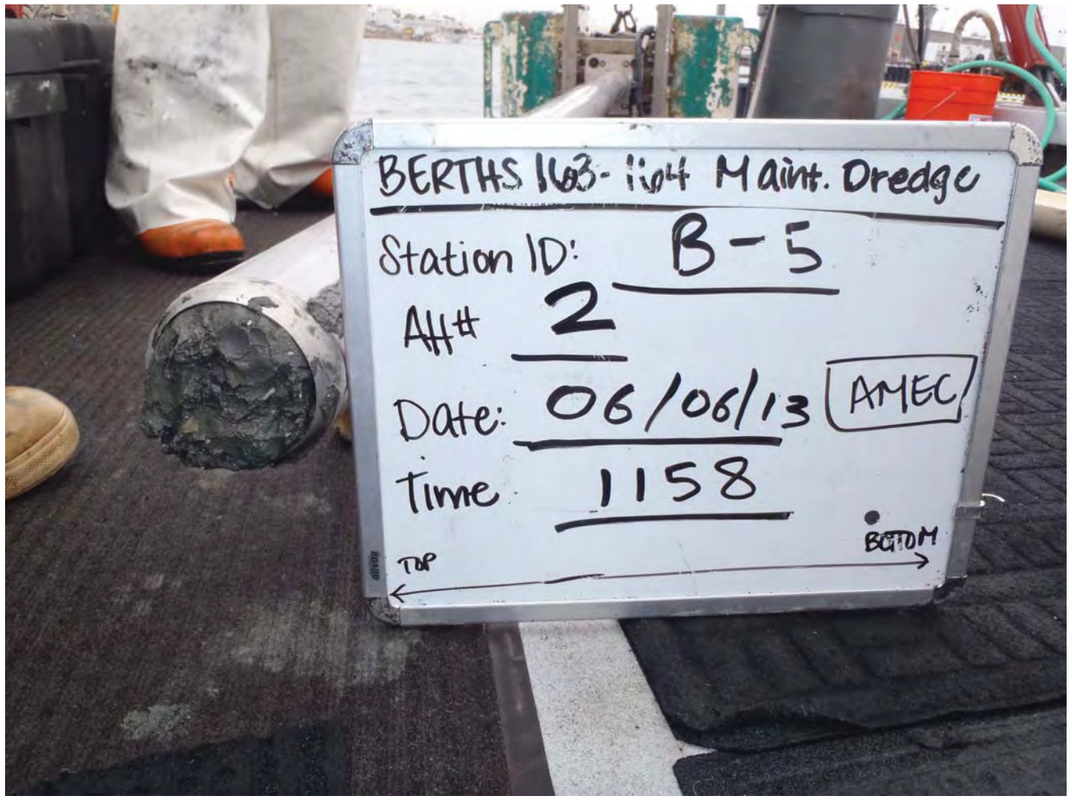


Location: POLA Berths 163 - 164
Sample ID: B5
Attempt #: 2
Core Length: 0 - 2.0 ft.
Sample Date & Time: 06/06/2013 1158



Location: POLA Berths 163 - 164
Sample ID: B5
Attempt #: 2
Core Length: 1 - 2.9 ft.
Sample Date & Time: 06/06/2013 1158

Port of Los Angeles
Berths 163 - 164 Sediment Study
AMEC Project No. 1015101930
June 2013



Location: POLA Berths 163 - 164
Sample ID: B5
Attempt #: 2
Core Length: Plug
Sample Date & Time: 06/06/2013 1158

APPENDIX C

SEDIMENT CHEMISTRY

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DRAFT Port of Los Angeles Maintenance Dredging Project Sediment Chemistry Data - Berths 163-164								
Analytical Method	**Compound Name**	**Type**	**ERL**	**ERM**	**Units**	**Reference**	**Composite A**	**Composite B**
	10-day Amphipod Survival	Toxicity	-	-	%	98	46	45
SM 2540 B (M)	Solids, Total	General Chemistry	-	-	%	71.1	65.3	60.9
EPA 9060A	Total Organic Carbon	General Chemistry	-	-	%	0.77	1.90	3.0
SM 4500-NH3 B/C (M)	Total Ammonia	General Chemistry	-	-	mg/kg	3.2	11	14
EPA 376.2M	Total Sulfides	General Chemistry	-	-	mg/kg	0.7	65	12
EPA 376.2M	Soluble Sulfides	General Chemistry	-	-	mg/kg	ND < 0.1	ND < 0.1	ND < 0.1
EPA 6020	Arsenic	Metals	8.2	70	mg/kg	2.86	**15.9**	**19.7**
EPA 6020	Cadmium	Metals	1.2	9.6	mg/kg	0.195	0.739	1.13
EPA 6020	Chromium	Metals	81	370	mg/kg	21.3	48.6	49.1
EPA 6020	Copper	Metals	34	270	mg/kg	10.4	**118**	**118**
EPA 6020	Lead	Metals	46.7	218	mg/kg	5.37	**112**	**324**
EPA 7471A	Mercury	Metals	0.15	0.71	mg/kg	ND < 0.0282	**1.05**	**0.89**
EPA 6020	Nickel	Metals	20.9	51.6	mg/kg	10.9	**22.5**	**29.5**
EPA 6020	Selenium	Metals	-	-	mg/kg	0.322	0.728	0.962
EPA 6020	Silver	Metals	1.0	3.7	mg/kg	0.176	0.318	0.357
EPA 6020	Zinc	Metals	150	410	mg/kg	46.5	**212**	**580**
EPA 8015B(M)	C6	TPH	-	-	mg/kg	ND < 7	ND < 7.7	ND < 8.2
EPA 8015B(M)	C7	TPH	-	-	mg/kg	ND < 7	ND < 7.7	ND < 8.2
EPA 8015B(M)	C8	TPH	-	-	mg/kg	ND < 7	ND < 7.7	ND < 8.2
EPA 8015B(M)	C9-C10	TPH	-	-	mg/kg	ND < 7	ND < 7.7	ND < 8.2
EPA 8015B(M)	C11-C12	TPH	-	-	mg/kg	ND < 7	ND < 7.7	ND < 8.2
EPA 8015B(M)	C13-C14	TPH	-	-	mg/kg	ND < 7	8.6	ND < 8.2
EPA 8015B(M)	C15-C16	TPH	-	-	mg/kg	ND < 7	13	ND < 8.2
EPA 8015B(M)	C17-C18	TPH	-	-	mg/kg	ND < 7	27	19
EPA 8015B(M)	C19-C20	TPH	-	-	mg/kg	ND < 7	30	33
EPA 8015B(M)	C21-C22	TPH	-	-	mg/kg	ND < 7	28	22
EPA 8015B(M)	C23-C24	TPH	-	-	mg/kg	ND < 7	34	29
EPA 8015B(M)	C25-C28	TPH	-	-	mg/kg	ND < 7	43	36
EPA 8015B(M)	C29-C32	TPH	-	-	mg/kg	ND < 7	56	53
EPA 8015B(M)	C33-C36	TPH	-	-	mg/kg	ND < 7	36	37
EPA 8015B(M)	C37-C40	TPH	-	-	mg/kg	ND < 7	27	20
EPA 8015B(M)	C41-C44	TPH	-	-	mg/kg	ND < 7	12	14
EPA 8015B(M)	Total TPH	TPH	-	-	mg/kg	ND < 7	320	270
EPA 8015B(M)	Total TPH (Sum of C6-C44)	TPH	-	-	mg/kg	ND < 7	314.6	263
EPA 418.1M	TRPH		-	-	mg/kg	18	720	640
EPA 8270C SIM	Naphthalene	PAH	160	2100	µg/kg	ND < 14	130	79
EPA 8270C SIM	Acenaphthylene	PAH	44	640	µg/kg	ND < 14	**180**	**180**
EPA 8270C SIM	Acenaphthene	PAH	16	500	µg/kg	ND < 14	**190**	ND < 33
EPA 8270C SIM	Fluorene	PAH	19	540	µg/kg	ND < 14	**240**	ND < 33
EPA 8270C SIM	Phenanthrene	PAH	240	1500	µg/kg	ND < 14	**820**	100
EPA 8270C SIM	Fluoranthene	PAH	600	5100	µg/kg	ND < 14	**1500**	500
EPA 8270C SIM	Pyrene	PAH	665	2600	µg/kg	ND < 14	**2700**	**980**
EPA 8270C SIM	Benzo (a) Anthracene	PAH	261	1600	µg/kg	ND < 14	**560**	**530**
EPA 8270C SIM	Chrysene	PAH	384	2800	µg/kg	ND < 14	**860**	**1100**
EPA 8270C SIM	Benzo (k) Fluoranthene	PAH	-	-	µg/kg	ND < 14	1100	700
EPA 8270C SIM	Benzo (b) Fluoranthene	PAH	-	-	µg/kg	ND < 14	1300	900
EPA 8270C SIM	Benzo (a) Pyrene	PAH	430	1600	µg/kg	ND < 14	**1100**	**640**
EPA 8270C SIM	Indeno (1,2,3-c,d) Pyrene	PAH	-	-	µg/kg	ND < 14	450	350
EPA 8270C SIM	Dibenzo (a,h) Anthracene	PAH	63.4	260	µg/kg	ND < 14	**120**	**120**
EPA 8270C SIM	Benzo (g,h,i) Perylene	PAH	-	-	µg/kg	ND < 14	470	340
	Total Detectable PAHs	PAH	4022	44792	µg/kg	ND < 14	**11720**	**6519**
EPA 8081A	2,4'-DDD	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	2,4'-DDE	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	2,4'-DDT	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	4,4'-DDD	Chlorinated Pesticides	2.0	20	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	4,4'-DDE	Chlorinated Pesticides	2.2	27	µg/kg	**2.6**	**20**	**10**
EPA 8081A	4,4'-DDT	Chlorinated Pesticides	1	7	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Aldrin	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Alpha-BHC	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Beta-BHC	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Chlordane	Chlorinated Pesticides	0.5	6.0	µg/kg	ND < 14	ND < 15	ND < 16
EPA 8081A	Delta-BHC	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Dieldrin	Chlorinated Pesticides	0.02	8.0	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Endosulfan I	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Endosulfan II	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Endosulfan Sulfate	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Endrin	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Endrin Aldehyde	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Gamma-BHC	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Heptachlor	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Heptachlor epoxide	Chlorinated Pesticides	-	-	µg/kg	ND < 1.4	ND < 1.5	ND < 1.6
EPA 8081A	Toxaphene	Chlorinated Pesticides	-	-	µg/kg	ND < 28	ND < 31	ND < 33

Draft

Analytical Method	Compound Name	Type	ERL	ERM	Units	Reference	Composite A	Composite B
EPA 8270C SIM PCB Congeners	PCB018	PCB Congeners	-	-	µg/kg	ND < 0.70	8.8	4.3
EPA 8270C SIM PCB Congeners	PCB028	PCB Congeners	-	-	µg/kg	ND < 0.70	7.2	7.2
EPA 8270C SIM PCB Congeners	PCB037	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB044	PCB Congeners	-	-	µg/kg	ND < 0.70	9.4	6.8
EPA 8270C SIM PCB Congeners	PCB049	PCB Congeners	-	-	µg/kg	ND < 0.70	57	38
EPA 8270C SIM PCB Congeners	PCB052	PCB Congeners	-	-	µg/kg	ND < 0.70	17	8.7
EPA 8270C SIM PCB Congeners	PCB066	PCB Congeners	-	-	µg/kg	ND < 0.70	2.9	1.6
EPA 8270C SIM PCB Congeners	PCB070	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB074	PCB Congeners	-	-	µg/kg	ND < 0.70	2.2	2.0
EPA 8270C SIM PCB Congeners	PCB077	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB081	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB087	PCB Congeners	-	-	µg/kg	ND < 0.70	5.7	2.6
EPA 8270C SIM PCB Congeners	PCB099	PCB Congeners	-	-	µg/kg	ND < 0.70	8.3	1.6
EPA 8270C SIM PCB Congeners	PCB101	PCB Congeners	-	-	µg/kg	ND < 0.70	19	6.0
EPA 8270C SIM PCB Congeners	PCB105	PCB Congeners	-	-	µg/kg	ND < 0.70	7.3	6.5
EPA 8270C SIM PCB Congeners	PCB110	PCB Congeners	-	-	µg/kg	ND < 0.70	18	7.7
EPA 8270C SIM PCB Congeners	PCB114	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB118	PCB Congeners	-	-	µg/kg	ND < 0.70	8.6	3.7
EPA 8270C SIM PCB Congeners	PCB119	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB123	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB126	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB128	PCB Congeners	-	-	µg/kg	ND < 0.70	1.9	1.5
EPA 8270C SIM PCB Congeners	PCB138/158	PCB Congeners	-	-	µg/kg	ND < 1.4	17	9.5
EPA 8270C SIM PCB Congeners	PCB149	PCB Congeners	-	-	µg/kg	ND < 0.70	10	5.4
EPA 8270C SIM PCB Congeners	PCB151	PCB Congeners	-	-	µg/kg	ND < 0.70	2.3	1.5
EPA 8270C SIM PCB Congeners	PCB153	PCB Congeners	-	-	µg/kg	ND < 0.70	12.0	6.3
EPA 8270C SIM PCB Congeners	PCB156	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB157	PCB Congeners	-	-	µg/kg	ND < 0.70	8.5	7.5
EPA 8270C SIM PCB Congeners	PCB167	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB168	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB169	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB170	PCB Congeners	-	-	µg/kg	ND < 0.70	4.4	3.1
EPA 8270C SIM PCB Congeners	PCB177	PCB Congeners	-	-	µg/kg	ND < 0.70	1.4	0.96
EPA 8270C SIM PCB Congeners	PCB180	PCB Congeners	-	-	µg/kg	ND < 0.70	3.8	3.9
EPA 8270C SIM PCB Congeners	PCB183	PCB Congeners	-	-	µg/kg	ND < 0.70	1.0	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB187	PCB Congeners	-	-	µg/kg	ND < 0.70	2.2	1.1
EPA 8270C SIM PCB Congeners	PCB189	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB194	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB201	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270C SIM PCB Congeners	PCB206	PCB Congeners	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
	Total Detectable PCBs	PCB Congeners	22.7	180	µg/kg	ND	**235.9**	**137.5**
EPA 8270D (M)/TQ/EI	Allethrin (Bioallethrin)	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Bifenthrin	Pyrethroids	-	-	µg/kg	ND < 0.70	1.4	2.1
EPA 8270D (M)/TQ/EI	Cyfluthrin-beta (Baythroid)	Pyrethroids	-	-	µg/kg	ND < 0.70	12	ND < 0.82
EPA 8270D (M)/TQ/EI	Cyalothrin-Lamba	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Cypermenthrin	Pyrethroids	-	-	µg/kg	ND < 0.70	0.13	ND < 0.82
EPA 8270D (M)/TQ/EI	Deltamethrin (Decamethrin)	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Esfenvalerate	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Fenpropathrin (Danitol)	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Fenvalerate (Sanmarton)	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Fluvalinate	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Permethrin - Cis/Trans	Pyrethroids	-	-	µg/kg	ND < 1.4	9.3	14
EPA 8270D (M)/TQ/EI	Sumithrin (Phenothrin)	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Resmethrin/Bioresmethrin	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Tetramethrin	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
EPA 8270D (M)/TQ/EI	Tralomethrin	Pyrethroids	-	-	µg/kg	ND < 0.70	ND < 0.77	ND < 0.82
Organotins By Krone et al.	Dibutyltin	Organotins	-	-	ug/kg	ND < 4.2	16	17
Organotins By Krone et al.	Monobutyltin	Organotins	-	-	ug/kg	ND < 4.2	ND < 4.6	ND < 4.9
Organotins By Krone et al.	Tetrabutyltin	Organotins	-	-	ug/kg	ND < 4.2	ND < 4.6	ND < 4.9
Organotins By Krone et al.	Tributyltin	Organotins	-	-	ug/kg	ND < 4.2	28	34

Draft

Analytical Method	Compound Name	Type	ERL	ERM	Units	Reference	Composite A	Composite B
EPA 8270 SIM	2,4,5-Trichlorophenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	2,4,6-Trichlorophenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	2,4-Dichlorophenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	2,4-Dimethylphenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	2,4-Dinitrophenol	Phenols	-	-	ug/kg	ND < 700	ND < 3800	ND < 1600
EPA 8270 SIM	2-Chlorophenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	2-Methylphenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	2-Nitrophenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	3/4-Methylphenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	4,6-Dinitro-2-Methylphenol	Phenols	-	-	ug/kg	ND < 700	ND < 3800	ND < 1600
EPA 8270 SIM	4-Chloro-3-Methylphenol	Phenols	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	4-Nitrophenol	Phenols	-	-	ug/kg	ND < 700	ND < 3800	ND < 1600
EPA 8270 SIM	Pentachlorophenol	Phenols	-	-	ug/kg	ND < 700	ND < 3800	ND < 1600
EPA 8270 SIM	Phenol	Phenols	-	-	ug/kg	33	ND < 77	ND < 33
EPA 8270 SIM	Bis(2-Ethylhexyl) Phthalate	Phthalates	-	-	ug/kg	14	300	96
EPA 8270 SIM	Butyl Benzyl Phthalate	Phthalates	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	Diethyl Phthalate	Phthalates	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	Dimethyl Phthalate	Phthalates	-	-	ug/kg	210	ND < 77	ND < 33
EPA 8270 SIM	Di-n-Butyl Phthalate	Phthalates	-	-	ug/kg	ND < 14	ND < 77	ND < 33
EPA 8270 SIM	Di-n-Octyl Phthalate	Phthalates	-	-	ug/kg	ND < 14	ND < 77	ND < 33

mg - miligram
kg - kilogram
µg - microgram
ND - Non Detect
PAH - Polyaromatic hydrocarbon
PCB - Polychlorinated biphenyl
TPH - Total petroleum hydrocarbons
TRPH - Total recoverable petrolium hydrocarbons
ERL - Effects Range Low
ERM - Effects Range Median
Red Font indicates value higher than ERL
Red Underlined Font indicates value higher than ERM

Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 13-06-0715

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: AMEC Environment & Infrastructure

Client Project Name: Berths 163-164

Attention: Barry Snyder
9210 Sky Park Court, Suite 200
San Diego, CA 92123-4302

Approved for release on 06/25/2013 by:
Danielle Gonsman
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Calscience Environmental Laboratories, Inc.

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Work Order Number: 13-06-0715

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Calscience Environmental Laboratories, Inc.

CASE NARRATIVE

Calscience Work Order No.: 13-06-0715
Project ID: Berths 163-164

Provided below is a narrative of our analytical effort, including any unique features or anomalies encountered as part of the analysis of the sediment samples.

Sample Condition on Receipt

Two sediment samples were received for this project on June 11, 2013. The samples were transferred to the laboratory in an ice-chest with wet ice, following strict chain-of-custody (COC) procedures. The temperature of the samples upon receipt at the laboratory was 1.4°C. All samples were logged into the Laboratory Information Management System (LIMS), given laboratory identification numbers and then stored in refrigeration units pending chemistry.

COC discrepancies (if any) were noted in the Sample Anomaly Form.

Tests Performed

Sediment:

Total Solids by SM 2540B
Ammonia by SM 4500-NH3-B/C (M)
Grain Size by ASTM D4464
Dissolved and Total Sulfide by EPA 376.2M
TRPH by EPA 418.1M
TPH C6-C44 by EPA 8015B (M)
Total Organic Carbon by EPA 9060A
Trace Metals by EPA 6020/7471
Chlorinated Pesticides by EPA 8081A
PCB Congeners by EPA 8270C SIM
PAHs, Phenols and Phthalates by EPA 8270C SIM
Pyrethroids by EPA 8270D (M)/TQ/EI
Organotins by Krone et al.

Data Summary

The sediment samples were homogenized prior to analysis.

<u>Holding times</u>

All holding times were met.

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Blanks

Concentrations of target analytes in the method blank were found to be below reporting limits for all testing.

Reporting Limits

The Method Detection Limits were met.

Laboratory Control Samples

A Laboratory Control Sample (LCS) analysis was performed for each applicable test. All parameters were within established control limits.

Matrix Spikes

Matrix spiking was performed at the required frequencies for the sediment on the project and non-project samples. All matrix spike parameters outside the acceptable control limits were noted below.

For Metals by EPA 6020 the Zn MS recovery was outside the control limits. Since the LCS recoveries were in control the results are released with no further action.

For Chlorinated Pesticides by EPA 8081A DDD, DDT, and methoxychlor were outs the control limits. Since the LCS recoveries were in control the results are released with no further action.

The Tributyltin MS recovery was outside the control limits. Since the LCS recoveries were in control the results are released with no further action.

For PCB Congeners by EPA 8270C SIM PCBs 77 and 101 had high recovery in the MS. Since the LCS recoveries were in control the results are released with no further action.

Surrogates

Surrogate recoveries for all applicable tests and samples were within acceptable control limits with the following exception:

For Chlorinated Pesticides by EPA 8081A the decachlorobiphenyl recovery was high in sample 1. The results have been appropriately flagged.

For PCB Congeners by EPA 8270C SIM the 2-fluorobiphenyl recovery was low in samples 1 and 2. The results have been appropriately flagged.

Acronyms

LCS - Laboratory Control Sample

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PDS - Post Digestion Spike
MS/MSD- Matrix Spike/Matrix Spike Duplicate
ME-Marginal Exceedance
RPD- Relative Percent Difference

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Work Order Narrative

Condition Upon Receipt:

Samples were received under Chain of Custody (COC) on 06/11/13. They were assigned to Work Order 13-06-0715.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with an immediate holding time (HT </= 15 minutes --40CFR-136.3 Table II footnote 4), is considered a "field" test and reported samples results are not flagged unless the analysis is performed beyond 24 hours of the time of collection.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

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Calscience Environmental Laboratories, Inc.

Sample Summary

Client:	AMEC Environment & Infrastructure	Work Order:	13-06-0715
	9210 Sky Park Court, Suite 200	Project Name:	Berths 163-164
	San Diego, CA 92123-4302	PO Number:	
		Date Received:	06/11/13
Attn:	Barry Snyder		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
B163-164 COMP A	13-06-0715-1	06/10/13 15:00	4	Sediment
B163-164 COMP B	13-06-0715-2	06/10/13 17:00	4	Sediment
B163-164 COMP B DUP	13-06-0715-3	06/10/13 00:00	1	Sediment

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 376.2M
		Units:	mg/kg
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-A**	**06/10/13 15:00**	**Sediment**	**N/A**	**06/17/13**	**06/17/13 14:45**	**D0617SL1**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	65	3.8	5	

B163-164 COMP B	**13-06-0715-2-A**	**06/10/13 17:00**	**Sediment**	**N/A**	**06/17/13**	**06/17/13 14:45**	**D0617SL1**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	12	0.49	0.6	

Method Blank	**099-05-001-4676**	**N/A**	**Soil**	**N/A**	**06/17/13**	**06/17/13 14:45**	**D0617SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	ND	0.10	0.2	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 376.2M
		Units:	mg/kg
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-B**	**06/10/13 15:00**	**Sediment**	**N/A**	**06/11/13**	**06/11/13 20:15**	**D0611DSL2**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Dissolved	ND	0.10	0.2	

B163-164 COMP B	**13-06-0715-2-C**	**06/10/13 17:00**	**Sediment**	**N/A**	**06/11/13**	**06/11/13 20:15**	**D0611DSL2**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Dissolved	ND	0.10	0.2	

Method Blank	**099-05-001-4677**	**N/A**	**Soil**	**N/A**	**06/11/13**	**06/11/13 20:15**	**D0611DSL2**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Dissolved	ND	0.10	0.2	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 9060A
		Units:	%
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-A**	**06/10/13 15:00**	**Sediment**	**TOC 5**	**06/17/13**	**06/17/13 18:28**	**D0617TOCL1**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Carbon, Total Organic	1.9	0.077	1	

B163-164 COMP B	**13-06-0715-2-A**	**06/10/13 17:00**	**Sediment**	**TOC 5**	**06/17/13**	**06/17/13 18:28**	**D0617TOCL1**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Carbon, Total Organic	3.0	0.082	1	

Method Blank	**099-06-013-876**	**N/A**	**Soil**	**TOC 5**	**06/17/13**	**06/17/13 18:28**	**D0617TOCL1**

Parameter	Result	RL	DF	Qualifiers
Carbon, Total Organic	ND	0.050	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 2540 B (M)
		Units:	%
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-D**	**06/10/13 15:00**	**Sediment**	**N/A**	**06/13/13**	**06/13/13 19:00**	**D0613TSB1**

Parameter	Result	RL	DF	Qualifiers
Solids, Total	65.3	0.100	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP B	**13-06-0715-2-D**	**06/10/13 17:00**	**Sediment**	**N/A**	**06/13/13**	**06/13/13 19:00**	**D0613TSB1**

Parameter	Result	RL	DF	Qualifiers
Solids, Total	60.9	0.100	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-05-019-2238**	**N/A**	**Soil**	**N/A**	**06/13/13**	**06/13/13 19:00**	**D0613TSB1**

Parameter	Result	RL	DF	Qualifiers
Solids, Total	ND	0.100	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 4500-NH3 B/C (M)
		Units:	mg/kg
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-B**	**06/10/13 15:00**	**Sediment**	**BUR05**	**06/19/13**	**06/19/13 14:00**	**D0619NH3L1**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Ammonia (as N)	11	0.31	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP B	**13-06-0715-2-B**	**06/10/13 17:00**	**Sediment**	**BUR05**	**06/19/13**	**06/19/13 14:00**	**D0619NH3L1**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Ammonia (as N)	14	0.33	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-816-61**	**N/A**	**Soil**	**BUR05**	**06/19/13**	**06/19/13 14:00**	**D0619NH3L1**

Parameter	Result	RL	DF	Qualifiers
Ammonia (as N)	ND	0.20	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	Extraction
		Method:	EPA 418.1M
		Units:	mg/kg
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-A**	**06/10/13 15:00**	**Sediment**	**IR 2**	**06/12/13**	**06/12/13 12:00**	**130612L01**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
TRPH	720	77	5	

B163-164 COMP B	**13-06-0715-2-A**	**06/10/13 17:00**	**Sediment**	**IR 2**	**06/12/13**	**06/12/13 12:00**	**130612L01**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
TRPH	640	82	5	

Method Blank	**099-07-015-1928**	**N/A**	**Soil**	**IR 2**	**06/12/13**	**06/12/13 12:00**	**130612L01**

Parameter	Result	RL	DF	Qualifiers
TRPH	ND	10	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: Berths 163-164			Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-A**	**06/10/13 15:00**	**Sediment**	**GC 45**	**06/12/13**	**06/12/13 15:37**	**130612B03**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
C6	ND	7.7	1	
C7	ND	7.7	1	
C8	ND	7.7	1	
C9-C10	ND	7.7	1	
C11-C12	ND	7.7	1	
C13-C14	8.6	7.7	1	
C15-C16	13	7.7	1	
C17-C18	27	7.7	1	
C19-C20	30	7.7	1	
C21-C22	28	7.7	1	
C23-C24	34	7.7	1	
C25-C28	43	7.7	1	
C29-C32	56	7.7	1	
C33-C36	36	7.7	1	
C37-C40	27	7.7	1	
C41-C44	12	7.7	1	
C6-C44 Total	320	7.7	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	82	61-145	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: Berths 163-164			Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP B	**13-06-0715-2-D**	**06/10/13 17:00**	**Sediment**	**GC 45**	**06/12/13**	**06/12/13 15:55**	**130612B03**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
C6	ND	8.2	1	
C7	ND	8.2	1	
C8	ND	8.2	1	
C9-C10	ND	8.2	1	
C11-C12	ND	8.2	1	
C13-C14	ND	8.2	1	
C15-C16	ND	8.2	1	
C17-C18	19	8.2	1	
C19-C20	33	8.2	1	
C21-C22	22	8.2	1	
C23-C24	29	8.2	1	
C25-C28	36	8.2	1	
C29-C32	53	8.2	1	
C33-C36	37	8.2	1	
C37-C40	20	8.2	1	
C41-C44	14	8.2	1	
C6-C44 Total	270	8.2	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	82	61-145	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: Berths 163-164			Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-490-359**	**N/A**	**Soil**	**GC 45**	**06/12/13**	**06/12/13 14:09**	**130612B03**

Parameter	Result	RL	DF	Qualifiers
C6	ND	5.0	1	
C7	ND	5.0	1	
C8	ND	5.0	1	
C9-C10	ND	5.0	1	
C11-C12	ND	5.0	1	
C13-C14	ND	5.0	1	
C15-C16	ND	5.0	1	
C17-C18	ND	5.0	1	
C19-C20	ND	5.0	1	
C21-C22	ND	5.0	1	
C23-C24	ND	5.0	1	
C25-C28	ND	5.0	1	
C29-C32	ND	5.0	1	
C33-C36	ND	5.0	1	
C37-C40	ND	5.0	1	
C41-C44	ND	5.0	1	
C6-C44 Total	ND	5.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	80	61-145	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/kg
Project: Berths 163-164			Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**GCTQ 1**	**06/13/13**	**06/17/13 23:39**	**130613L01**

Comment(s): - Results are reported on a dry weight basis.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.77	0.39	1	
Bifenthrin	1.4	0.77	0.14	1	
Cyfluthrin	12	0.77	0.13	1	
Cypermethrin	0.13	0.77	0.11	1	J
Deltamethrin/Tralomethrin	ND	0.77	0.32	1	
Fenpropathrin	ND	0.77	0.056	1	
Fenvalerate/Esfenvalerate	ND	0.77	0.055	1	
Fluvalinate	ND	0.77	0.088	1	
Permethrin (cis/trans)	9.3	1.5	0.17	1	
Phenothrin	ND	0.77	0.11	1	
Resmethrin/Bioresmethrin	ND	0.77	0.14	1	
Tetramethrin	ND	0.77	0.058	1	
lambda-Cyhalothrin	ND	0.77	0.067	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	102	25-200	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/kg
Project: Berths 163-164			Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP B	**13-06-0715-2-E**	**06/10/13 17:00**	**Sediment**	**GCTQ 1**	**06/13/13**	**06/18/13 00:15**	**130613L01**

Comment(s): - Results are reported on a dry weight basis.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.82	0.42	1	
Bifenthrin	2.1	0.82	0.15	1	
Cyfluthrin	ND	0.82	0.14	1	
Cypermethrin	ND	0.82	0.11	1	
Deltamethrin/Tralomethrin	ND	0.82	0.34	1	
Fenpropathrin	ND	0.82	0.060	1	
Fenvalerate/Esfenvalerate	ND	0.82	0.059	1	
Fluvalinate	ND	0.82	0.094	1	
Permethrin (cis/trans)	14	1.6	0.18	1	
Phenothrin	ND	0.82	0.11	1	
Resmethrin/Bioresmethrin	ND	0.82	0.15	1	
Tetramethrin	ND	0.82	0.062	1	
lambda-Cyhalothrin	ND	0.82	0.072	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	84	25-200	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/kg
Project: Berths 163-164			Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-403-34**	**N/A**	**Sediment**	**GCTQ 1**	**06/13/13**	**06/17/13 22:25**	**130613L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.50	0.26	1	
Bifenthrin	ND	0.50	0.094	1	
Cyfluthrin	ND	0.50	0.085	1	
Cypermethrin	ND	0.50	0.069	1	
Deltamethrin/Tralomethrin	ND	0.50	0.21	1	
Fenpropathrin	ND	0.50	0.036	1	
Fenvalerate/Esfenvalerate	ND	0.50	0.036	1	
Fluvalinate	ND	0.50	0.057	1	
Permethrin (cis/trans)	ND	1.0	0.11	1	
Phenothrin	ND	0.50	0.069	1	
Resmethrin/Bioresmethrin	ND	0.50	0.092	1	
Tetramethrin	ND	0.50	0.038	1	
lambda-Cyhalothrin	ND	0.50	0.044	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	82	25-200	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
		Units:	mg/kg
Project: Berths 163-164			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**ICP/MS 03**	**06/12/13**	**06/12/13 13:39**	**130612L01E**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Arsenic	15.9	0.153	1	
Cadmium	0.739	0.153	1	
Chromium	48.6	0.153	1	
Copper	118	0.153	1	
Lead	112	0.153	1	
Nickel	22.5	0.153	1	
Selenium	0.728	0.153	1	
Silver	0.318	0.153	1	
Zinc	212	1.53	1	

B163-164 COMP B	**13-06-0715-2-E**	**06/10/13 17:00**	**Sediment**	**ICP/MS 03**	**06/12/13**	**06/12/13 13:42**	**130612L01E**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Arsenic	19.7	0.164	1	
Cadmium	1.13	0.164	1	
Chromium	49.1	0.164	1	
Copper	118	0.164	1	
Lead	324	0.164	1	
Nickel	29.5	0.164	1	
Selenium	0.962	0.164	1	
Silver	0.357	0.164	1	
Zinc	580	1.64	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
		Units:	mg/kg
Project: Berths 163-164			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-254-116**	**N/A**	**Soil**	**ICP/MS 03**	**06/12/13**	**06/12/13 13:03**	**130612L01E**

Parameter	Result	RL	DF	Qualifiers
Arsenic	ND	0.100	1	
Cadmium	ND	0.100	1	
Chromium	ND	0.100	1	
Copper	ND	0.100	1	
Lead	ND	0.100	1	
Nickel	ND	0.100	1	
Selenium	ND	0.100	1	
Silver	ND	0.100	1	
Zinc	ND	1.00	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
		Units:	mg/kg
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**Mercury**	**06/12/13**	**06/12/13 13:29**	**130612L05E**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Mercury	1.05	0.0307	1	

B163-164 COMP B	**13-06-0715-2-E**	**06/10/13 17:00**	**Sediment**	**Mercury**	**06/12/13**	**06/12/13 13:31**	**130612L05E**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Mercury	0.890	0.0329	1	

Method Blank	**099-12-452-383**	**N/A**	**Soil**	**Mercury**	**06/12/13**	**06/12/13 13:13**	**130612L05E**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0200	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	ASTM D4464 (M)
		Units:	%
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-C**	**06/10/13 15:00**	**Sediment**	**LPSA 1**	**N/A**	**06/12/13 12:38**	

Parameter	Result	Qualifiers
Clay (less than 0.00391mm)	23.08	
Silt (0.00391 to 0.0625mm)	61.80	
Total Silt and Clay (0 to 0.0625mm)	84.87	
Very Fine Sand (0.0625 to 0.125mm)	1.24	
Fine Sand (0.125 to 0.25mm)	ND	
Medium Sand (0.25 to 0.5mm)	ND	
Coarse Sand (0.5 to 1mm)	ND	
Very Coarse Sand (1 to 2mm)	ND	
Gravel (greater than 2mm)	13.89	

B163-164 COMP B	**13-06-0715-2-C**	**06/10/13 17:00**	**Sediment**	**LPSA 1**	**N/A**	**06/12/13 12:58**	

Parameter	Result	Qualifiers
Clay (less than 0.00391mm)	27.78	
Silt (0.00391 to 0.0625mm)	68.03	
Total Silt and Clay (0 to 0.0625mm)	95.81	
Very Fine Sand (0.0625 to 0.125mm)	4.19	
Fine Sand (0.125 to 0.25mm)	ND	
Medium Sand (0.25 to 0.5mm)	ND	
Coarse Sand (0.5 to 1mm)	ND	
Very Coarse Sand (1 to 2mm)	ND	
Gravel (greater than 2mm)	ND	

B163-164 COMP B DUP	**13-06-0715-3-C**	**06/10/13 00:00**	**Sediment**	**LPSA 1**	**N/A**	**06/12/13 13:38**	

Parameter	Result	Qualifiers
Clay (less than 0.00391mm)	22.86	
Silt (0.00391 to 0.0625mm)	72.70	
Total Silt and Clay (0 to 0.0625mm)	95.56	
Very Fine Sand (0.0625 to 0.125mm)	4.44	
Fine Sand (0.125 to 0.25mm)	ND	
Medium Sand (0.25 to 0.5mm)	ND	
Coarse Sand (0.5 to 1mm)	ND	
Very Coarse Sand (1 to 2mm)	ND	
Gravel (greater than 2mm)	ND	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: Berths 163-164			Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**GC 51**	**06/12/13**	**06/14/13 14:23**	**130612L06**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Aldrin	ND	1.5	1	
Alpha-BHC	ND	1.5	1	
Beta-BHC	ND	1.5	1	
Delta-BHC	ND	1.5	1	
Gamma-BHC	ND	1.5	1	
Chlordane	ND	15	1	
Dieldrin	ND	1.5	1	
Trans-nonachlor	ND	1.5	1	
2,4'-DDD	ND	1.5	1	
2,4'-DDE	ND	1.5	1	
2,4'-DDT	ND	1.5	1	
4,4'-DDD	ND	1.5	1	
4,4'-DDT	ND	1.5	1	
Endosulfan I	ND	1.5	1	
Endosulfan II	ND	1.5	1	
Endosulfan Sulfate	ND	1.5	1	
Endrin	ND	1.5	1	
Endrin Aldehyde	ND	1.5	1	
Endrin Ketone	ND	1.5	1	
Heptachlor	ND	1.5	1	
Heptachlor Epoxide	ND	1.5	1	
Methoxychlor	ND	1.5	1	
Toxaphene	ND	31	1	
Alpha Chlordane	ND	1.5	1	
Gamma Chlordane	ND	1.5	1	
Cis-nonachlor	ND	1.5	1	
Oxychlordane	ND	1.5	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,5,6-Tetrachloro-m-Xylene	103	50-130	
Decachlorobiphenyl	132	50-130	2,7

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: Berths 163-164			Page 2 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**GC 51**	**06/12/13**	**06/14/13 14:52**	**130612L06**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
4,4'-DDE	20	7.7	5	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,5,6-Tetrachloro-m-Xylene	98	50-130	
Decachlorobiphenyl	123	50-130	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: Berths 163-164			Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP B	**13-06-0715-2-E**	**06/10/13 17:00**	**Sediment**	**GC 51**	**06/12/13**	**06/14/13 14:38**	**130612L06**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Aldrin	ND	1.6	1	
Alpha-BHC	ND	1.6	1	
Beta-BHC	ND	1.6	1	
Delta-BHC	ND	1.6	1	
Gamma-BHC	ND	1.6	1	
Chlordane	ND	16	1	
Dieldrin	ND	1.6	1	
Trans-nonachlor	ND	1.6	1	
2,4'-DDD	ND	1.6	1	
2,4'-DDE	ND	1.6	1	
2,4'-DDT	ND	1.6	1	
4,4'-DDD	ND	1.6	1	
4,4'-DDE	10	1.6	1	
4,4'-DDT	ND	1.6	1	
Endosulfan I	ND	1.6	1	
Endosulfan II	ND	1.6	1	
Endosulfan Sulfate	ND	1.6	1	
Endrin	ND	1.6	1	
Endrin Aldehyde	ND	1.6	1	
Endrin Ketone	ND	1.6	1	
Heptachlor	ND	1.6	1	
Heptachlor Epoxide	ND	1.6	1	
Methoxychlor	ND	1.6	1	
Toxaphene	ND	33	1	
Alpha Chlordane	ND	1.6	1	
Gamma Chlordane	ND	1.6	1	
Cis-nonachlor	ND	1.6	1	
Oxychlordane	ND	1.6	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,5,6-Tetrachloro-m-Xylene	113	50-130	
Decachlorobiphenyl	115	50-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: Berths 163-164			Page 4 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-858-206**	**N/A**	**Soil**	**GC 51**	**06/12/13**	**06/17/13 14:41**	**130612L06**

Parameter	Result	RL	DF	Qualifiers
Aldrin	ND	1.0	1	
Alpha-BHC	ND	1.0	1	
Beta-BHC	ND	1.0	1	
Delta-BHC	ND	1.0	1	
Gamma-BHC	ND	1.0	1	
Chlordane	ND	10	1	
Dieldrin	ND	1.0	1	
Trans-nonachlor	ND	1.0	1	
2,4'-DDD	ND	1.0	1	
2,4'-DDE	ND	1.0	1	
2,4'-DDT	ND	1.0	1	
4,4'-DDD	ND	1.0	1	
4,4'-DDE	ND	1.0	1	
4,4'-DDT	ND	1.0	1	
Endosulfan I	ND	1.0	1	
Endosulfan II	ND	1.0	1	
Endosulfan Sulfate	ND	1.0	1	
Endrin	ND	1.0	1	
Endrin Aldehyde	ND	1.0	1	
Endrin Ketone	ND	1.0	1	
Heptachlor	ND	1.0	1	
Heptachlor Epoxide	ND	1.0	1	
Methoxychlor	ND	1.0	1	
Toxaphene	ND	20	1	
Alpha Chlordane	ND	1.0	1	
Gamma Chlordane	ND	1.0	1	
Cis-nonachlor	ND	1.0	1	
Oxychlordane	ND	1.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,5,6-Tetrachloro-m-Xylene	95	50-130	
Decachlorobiphenyl	92	50-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
		Units:	ug/kg
Project: Berths 163-164			Page 1 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**GC/MS MM**	**06/17/13**	**06/19/13 16:02**	**130617L12**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
1-Methylnaphthalene	ND	77	5	
2,4,5-Trichlorophenol	ND	77	5	
2,4,6-Trichlorophenol	ND	77	5	
2,4-Dichlorophenol	ND	77	5	
2,4-Dimethylphenol	ND	77	5	
2,4-Dinitrophenol	ND	3800	5	
2-Chlorophenol	ND	77	5	
2-Methylnaphthalene	ND	77	5	
2-Methylphenol	ND	77	5	
2-Nitrophenol	ND	77	5	
3/4-Methylphenol	ND	77	5	
4,6-Dinitro-2-Methylphenol	ND	3800	5	
4-Chloro-3-Methylphenol	ND	77	5	
4-Nitrophenol	ND	3800	5	
Acenaphthene	190	77	5	
Acenaphthylene	180	77	5	
Anthracene	620	77	5	
Benzo (a) Anthracene	560	77	5	
Benzo (a) Pyrene	1100	77	5	
Benzo (b) Fluoranthene	1300	77	5	
Benzo (g,h,i) Perylene	470	77	5	
Benzo (k) Fluoranthene	1100	77	5	
Bis(2-Ethylhexyl) Phthalate	300	77	5	
Butyl Benzyl Phthalate	ND	77	5	
Chrysene	860	77	5	
Di-n-Butyl Phthalate	ND	77	5	
Di-n-Octyl Phthalate	ND	77	5	
Dibenz (a,h) Anthracene	120	77	5	
Diethyl Phthalate	ND	77	5	
Dimethyl Phthalate	ND	77	5	
Fluoranthene	1500	77	5	
Fluorene	240	77	5	
Indeno (1,2,3-c,d) Pyrene	450	77	5	
Naphthalene	130	77	5	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure	Date Received:	06/11/13
9210 Sky Park Court, Suite 200	Work Order:	13-06-0715
San Diego, CA 92123-4302	Preparation:	EPA 3545
	Method:	EPA 8270C SIM
	Units:	ug/kg
Project: Berths 163-164		Page 2 of 6

Parameter	Result	RL	DF	Qualifiers
Pentachlorophenol	ND	3800	5	
Phenanthrene	820	77	5	
Phenol	ND	77	5	
Pyrene	2700	77	5	
1,6,7-Trimethylnaphthalene	120	77	5	
2,3,4,6-Tetrachlorophenol	ND	77	5	
2,6-Dichlorophenol	ND	77	5	
Dibenzothiophene	ND	77	5	
1-Methylphenanthrene	ND	77	5	
Benzo (e) Pyrene	990	77	5	
Perylene	400	77	5	
Biphenyl	ND	77	5	
2,6-Dimethylnaphthalene	150	77	5	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,6-Tribromophenol	77	32-143	
2-Fluorobiphenyl	67	14-146	
2-Fluorophenol	62	15-138	
Nitrobenzene-d5	55	18-162	
p-Terphenyl-d14	79	34-148	
Phenol-d6	62	17-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
		Units:	ug/kg
Project: Berths 163-164			Page 3 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP B	**13-06-0715-2-E**	**06/10/13 17:00**	**Sediment**	**GC/MS MM**	**06/17/13**	**06/19/13 15:36**	**130617L12**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
1-Methylnaphthalene	ND	33	2	
2,4,5-Trichlorophenol	ND	33	2	
2,4,6-Trichlorophenol	ND	33	2	
2,4-Dichlorophenol	ND	33	2	
2,4-Dimethylphenol	ND	33	2	
2,4-Dinitrophenol	ND	1600	2	
2-Chlorophenol	ND	33	2	
2-Methylnaphthalene	ND	33	2	
2-Methylphenol	ND	33	2	
2-Nitrophenol	ND	33	2	
3/4-Methylphenol	ND	33	2	
4,6-Dinitro-2-Methylphenol	ND	1600	2	
4-Chloro-3-Methylphenol	ND	33	2	
4-Nitrophenol	ND	1600	2	
Acenaphthene	ND	33	2	
Acenaphthylene	180	33	2	
Anthracene	260	33	2	
Benzo (a) Anthracene	530	33	2	
Benzo (a) Pyrene	640	33	2	
Benzo (b) Fluoranthene	900	33	2	
Benzo (g,h,i) Perylene	340	33	2	
Benzo (k) Fluoranthene	700	33	2	
Bis(2-Ethylhexyl) Phthalate	96	33	2	
Butyl Benzyl Phthalate	ND	33	2	
Chrysene	1100	33	2	
Di-n-Butyl Phthalate	ND	33	2	
Di-n-Octyl Phthalate	ND	33	2	
Dibenz (a,h) Anthracene	120	33	2	
Diethyl Phthalate	ND	33	2	
Dimethyl Phthalate	ND	33	2	
Fluoranthene	500	33	2	
Fluorene	ND	33	2	
Indeno (1,2,3-c,d) Pyrene	350	33	2	
Naphthalene	79	33	2	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure	Date Received:	06/11/13
9210 Sky Park Court, Suite 200	Work Order:	13-06-0715
San Diego, CA 92123-4302	Preparation:	EPA 3545
	Method:	EPA 8270C SIM
	Units:	ug/kg
Project: Berths 163-164		Page 4 of 6

Parameter	Result	RL	DF	Qualifiers
Pentachlorophenol	ND	1600	2	
Phenanthrene	100	33	2	
Phenol	ND	33	2	
Pyrene	980	33	2	
1,6,7-Trimethylnaphthalene	ND	33	2	
2,3,4,6-Tetrachlorophenol	ND	33	2	
2,6-Dichlorophenol	ND	33	2	
Dibenzothiophene	ND	33	2	
1-Methylphenanthrene	ND	33	2	
Benzo (e) Pyrene	670	33	2	
Perylene	250	33	2	
Biphenyl	ND	33	2	
2,6-Dimethylnaphthalene	39	33	2	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,6-Tribromophenol	67	32-143	
2-Fluorobiphenyl	55	14-146	
2-Fluorophenol	61	15-138	
Nitrobenzene-d5	53	18-162	
p-Terphenyl-d14	64	34-148	
Phenol-d6	60	17-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
		Units:	ug/kg
Project: Berths 163-164			Page 5 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-256-36**	**N/A**	**Soil**	**GC/MS MM**	**06/17/13**	**06/18/13 19:10**	**130617L12**

Parameter	Result	RL	DF	Qualifiers
1-Methylnaphthalene	ND	10	1	
2,4,5-Trichlorophenol	ND	10	1	
2,4,6-Trichlorophenol	ND	10	1	
2,4-Dichlorophenol	ND	10	1	
2,4-Dimethylphenol	ND	10	1	
2,4-Dinitrophenol	ND	500	1	
2-Chlorophenol	ND	10	1	
2-Methylnaphthalene	ND	10	1	
2-Methylphenol	ND	10	1	
2-Nitrophenol	ND	10	1	
3/4-Methylphenol	ND	10	1	
4,6-Dinitro-2-Methylphenol	ND	500	1	
4-Chloro-3-Methylphenol	ND	10	1	
4-Nitrophenol	ND	500	1	
Acenaphthene	ND	10	1	
Acenaphthylene	ND	10	1	
Anthracene	ND	10	1	
Benzo (a) Anthracene	ND	10	1	
Benzo (a) Pyrene	ND	10	1	
Benzo (b) Fluoranthene	ND	10	1	
Benzo (g,h,i) Perylene	ND	10	1	
Benzo (k) Fluoranthene	ND	10	1	
Bis(2-Ethylhexyl) Phthalate	ND	10	1	
Butyl Benzyl Phthalate	ND	10	1	
Chrysene	ND	10	1	
Di-n-Butyl Phthalate	ND	10	1	
Di-n-Octyl Phthalate	ND	10	1	
Dibenz (a,h) Anthracene	ND	10	1	
Diethyl Phthalate	ND	10	1	
Dimethyl Phthalate	ND	10	1	
Fluoranthene	ND	10	1	
Fluorene	ND	10	1	
Indeno (1,2,3-c,d) Pyrene	ND	10	1	
Naphthalene	ND	10	1	
Pentachlorophenol	ND	500	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure	Date Received:	06/11/13
9210 Sky Park Court, Suite 200	Work Order:	13-06-0715
San Diego, CA 92123-4302	Preparation:	EPA 3545
	Method:	EPA 8270C SIM
	Units:	ug/kg
Project: Berths 163-164		Page 6 of 6

Parameter	Result	RL	DF	Qualifiers
Phenanthrene	ND	10	1	
Phenol	ND	10	1	
Pyrene	ND	10	1	
1,6,7-Trimethylnaphthalene	ND	10	1	
2,3,4,6-Tetrachlorophenol	ND	10	1	
2,6-Dichlorophenol	ND	10	1	
Dibenzothiophene	ND	10	1	
1-Methylphenanthrene	ND	10	1	
Benzo (e) Pyrene	ND	10	1	
Perylene	ND	10	1	
Biphenyl	ND	10	1	
2,6-Dimethylnaphthalene	ND	10	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,6-Tribromophenol	72	32-143	
2-Fluorobiphenyl	79	14-146	
2-Fluorophenol	83	15-138	
Nitrobenzene-d5	76	18-162	
p-Terphenyl-d14	84	34-148	
Phenol-d6	83	17-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Berths 163-164			Page 1 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**GC/MS HHH**	**06/17/13**	**06/19/13 20:52**	**130617L13**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
PCB018	8.8	0.77	1	
PCB028	7.2	0.77	1	
PCB037	ND	0.77	1	
PCB044	9.4	0.77	1	
PCB049	57	0.77	1	
PCB052	17	0.77	1	
PCB066	2.9	0.77	1	
PCB070	ND	0.77	1	
PCB074	2.2	0.77	1	
PCB077	ND	0.77	1	
PCB081	ND	0.77	1	
PCB087	5.7	0.77	1	
PCB099	8.3	0.77	1	
PCB101	19	0.77	1	
PCB105	7.3	0.77	1	
PCB110	18	0.77	1	
PCB114	ND	0.77	1	
PCB118	8.6	0.77	1	
PCB119	ND	0.77	1	
PCB123	ND	0.77	1	
PCB126	ND	0.77	1	
PCB128	1.9	0.77	1	
PCB138/158	17	1.5	1	
PCB149	10	0.77	1	
PCB151	2.3	0.77	1	
PCB153	12	0.77	1	
PCB156	ND	0.77	1	
PCB157	8.5	0.77	1	
PCB167	ND	0.77	1	
PCB168	ND	0.77	1	
PCB169	ND	0.77	1	
PCB170	4.4	0.77	1	
PCB177	1.4	0.77	1	
PCB180	3.8	0.77	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Berths 163-164			Page 2 of 6

Parameter	Result	RL	DF	Qualifiers
PCB183	1.0	0.77	1	
PCB187	2.2	0.77	1	
PCB189	ND	0.77	1	
PCB194	ND	0.77	1	
PCB201	ND	0.77	1	
PCB206	ND	0.77	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	44	50-125	1,2,6
p-Terphenyl-d14	88	50-125	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Berths 163-164			Page 3 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP B	**13-06-0715-2-E**	**06/10/13 17:00**	**Sediment**	**GC/MS HHH**	**06/13/13**	**06/19/13 21:19**	**130617L13**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
PCB018	4.3	0.82	1	
PCB028	7.2	0.82	1	
PCB037	ND	0.82	1	
PCB044	6.8	0.82	1	
PCB049	38	0.82	1	
PCB052	8.7	0.82	1	
PCB066	1.6	0.82	1	
PCB070	ND	0.82	1	
PCB074	2.0	0.82	1	
PCB077	ND	0.82	1	
PCB081	ND	0.82	1	
PCB087	2.6	0.82	1	
PCB099	1.6	0.82	1	
PCB101	6.0	0.82	1	
PCB105	6.5	0.82	1	
PCB110	7.7	0.82	1	
PCB114	ND	0.82	1	
PCB118	3.7	0.82	1	
PCB119	ND	0.82	1	
PCB123	ND	0.82	1	
PCB126	ND	0.82	1	
PCB128	1.5	0.82	1	
PCB138/158	9.5	1.6	1	
PCB149	5.4	0.82	1	
PCB151	1.5	0.82	1	
PCB153	6.3	0.82	1	
PCB156	ND	0.82	1	
PCB157	7.5	0.82	1	
PCB167	ND	0.82	1	
PCB168	ND	0.82	1	
PCB169	ND	0.82	1	
PCB170	3.1	0.82	1	
PCB177	0.96	0.82	1	
PCB180	3.9	0.82	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Berths 163-164			Page 4 of 6

Parameter	Result	RL	DF	Qualifiers
PCB183	ND	0.82	1	
PCB187	1.1	0.82	1	
PCB189	ND	0.82	1	
PCB194	ND	0.82	1	
PCB201	ND	0.82	1	
PCB206	ND	0.82	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	28	50-125	1,2,6
p-Terphenyl-d14	80	50-125	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Berths 163-164			Page 5 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-341-105**	**N/A**	**Soil**	**GC/MS HHH**	**06/17/13**	**06/19/13 16:41**	**130617L13**

Parameter	Result	RL	DF	Qualifiers
PCB018	ND	0.50	1	
PCB028	ND	0.50	1	
PCB037	ND	0.50	1	
PCB044	ND	0.50	1	
PCB049	ND	0.50	1	
PCB052	ND	0.50	1	
PCB066	ND	0.50	1	
PCB070	ND	0.50	1	
PCB074	ND	0.50	1	
PCB077	ND	0.50	1	
PCB081	ND	0.50	1	
PCB087	ND	0.50	1	
PCB099	ND	0.50	1	
PCB101	ND	0.50	1	
PCB105	ND	0.50	1	
PCB110	ND	0.50	1	
PCB114	ND	0.50	1	
PCB118	ND	0.50	1	
PCB119	ND	0.50	1	
PCB123	ND	0.50	1	
PCB126	ND	0.50	1	
PCB128	ND	0.50	1	
PCB138/158	ND	1.0	1	
PCB149	ND	0.50	1	
PCB151	ND	0.50	1	
PCB153	ND	0.50	1	
PCB156	ND	0.50	1	
PCB157	ND	0.50	1	
PCB167	ND	0.50	1	
PCB168	ND	0.50	1	
PCB169	ND	0.50	1	
PCB170	ND	0.50	1	
PCB177	ND	0.50	1	
PCB180	ND	0.50	1	
PCB183	ND	0.50	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Berths 163-164			Page 6 of 6

Parameter	Result	RL	DF	Qualifiers
PCB187	ND	0.50	1	
PCB189	ND	0.50	1	
PCB194	ND	0.50	1	
PCB201	ND	0.50	1	
PCB206	ND	0.50	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	50	50-125	
p-Terphenyl-d14	74	50-125	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B (M)
		Method:	Organotins by Krone et al.
		Units:	ug/kg
Project: Berths 163-164			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 COMP A	**13-06-0715-1-E**	**06/10/13 15:00**	**Sediment**	**GC/MS JJJ**	**06/12/13**	**06/14/13 13:10**	**130612L04**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	16	4.6	1	
Monobutyltin	ND	4.6	1	
Tetrabutyltin	ND	4.6	1	
Tributyltin	28	4.6	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	78	48-126	

B163-164 COMP B	**13-06-0715-2-E**	**06/10/13 17:00**	**Sediment**	**GC/MS JJJ**	**06/12/13**	**06/14/13 13:40**	**130612L04**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	17	4.9	1	
Monobutyltin	ND	4.9	1	
Tetrabutyltin	ND	4.9	1	
Tributyltin	34	4.9	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	70	48-126	

Method Blank	**099-07-016-1032**	**N/A**	**Soil**	**GC/MS JJJ**	**06/12/13**	**06/14/13 10:40**	**130612L04**

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	ND	3.0	1	
Monobutyltin	ND	3.0	1	
Tetrabutyltin	ND	3.0	1	
Tributyltin	ND	3.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	66	48-126	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

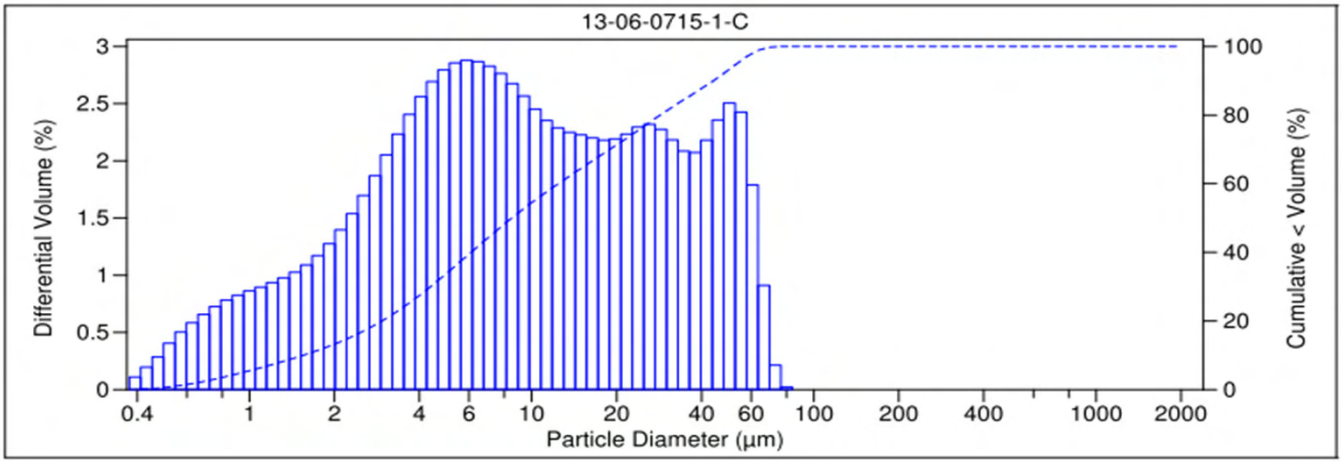
PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

AMEC Environment & Infrastructure		Date Sampled:	6/10/2013
9210 Sky Park Court, Suite 200		Date Received:	6/11/2013
San Diego, CA 92123-4302		Work Order No:	13-06-0715
		Date Analyzed:	6/12/2013
		Method:	ASTM D4464M
Project:	Berths 163-164		Page 1 of 3

Sample ID	Depth ft	Description	Mean Grain Size mm
B163-164 COMP A		Medium Sand	0.432

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
13.89	0.00	0.00	0.00	0.00	1.24	61.80	23.08	84.87



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Calscience Environmental Laboratories, Inc.

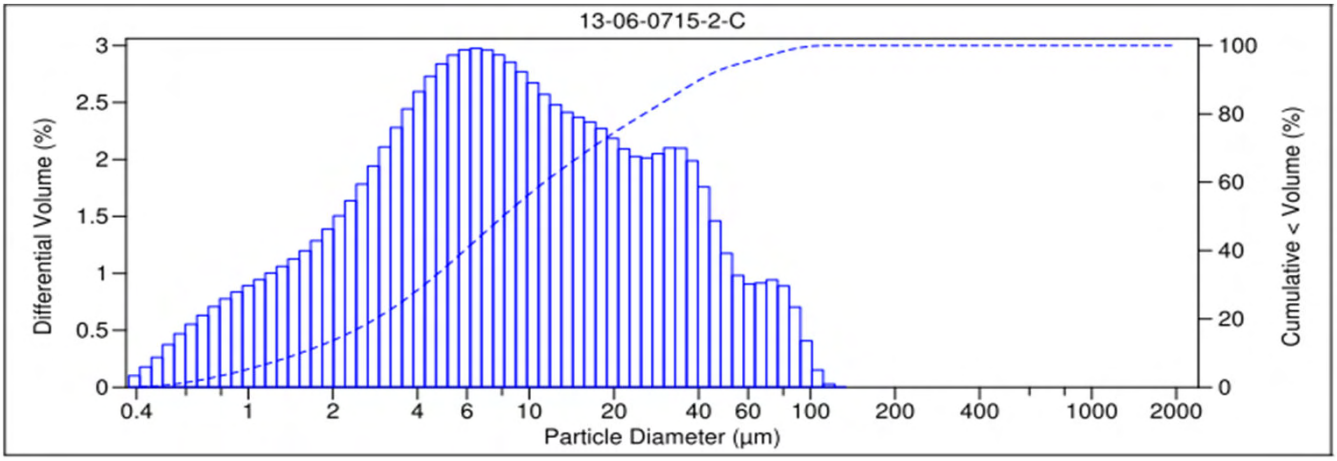
PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

AMEC Environment & Infrastructure		Date Sampled:	6/10/2013
9210 Sky Park Court, Suite 200		Date Received:	6/11/2013
San Diego, CA 92123-4302		Work Order No:	13-06-0715
		Date Analyzed:	6/12/2013
		Method:	ASTM D4464M
Project:	Berths 163-164		Page 2 of 3

Sample ID	Depth ft	Description	Mean Grain Size mm
B163-164		Silt	0.016

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	0.00	4.19	68.03	27.78	95.81



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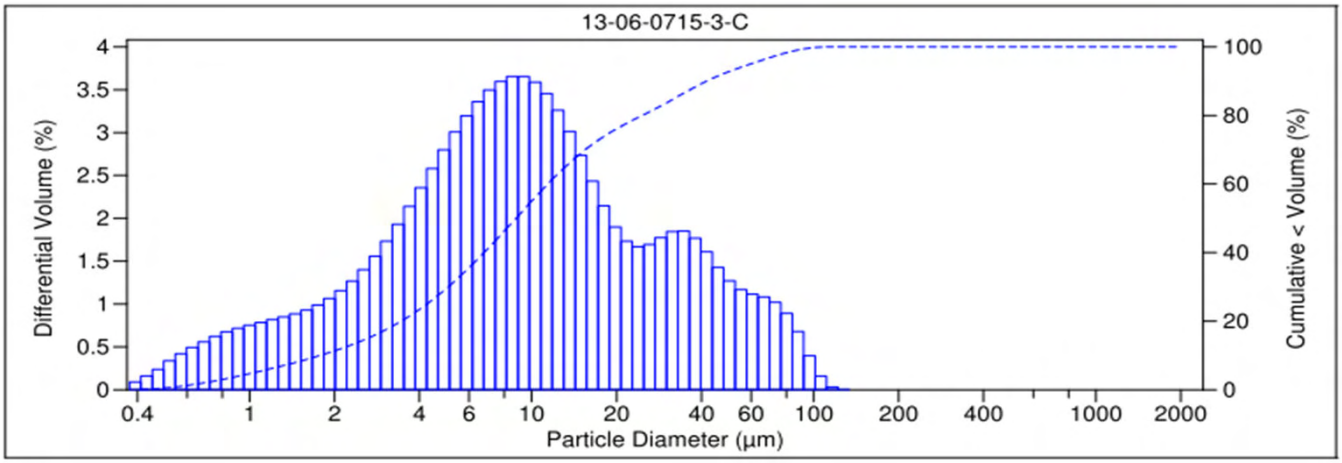
PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

AMEC Environment & Infrastructure		Date Sampled:	6/10/2013
9210 Sky Park Court, Suite 200		Date Received:	6/11/2013
San Diego, CA 92123-4302		Work Order No:	13-06-0715
		Date Analyzed:	6/12/2013
		Method:	ASTM D4464M
Project:	Berths 163-164		Page 3 of 3

Sample ID	Depth ft	Description	Mean Grain Size mm
B163-164 COMP B DUP		Silt	0.016

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	0.00	4.44	72.70	22.86	95.56



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Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 9060A
Project: Berths 163-164			Page 1 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-06-0526-1	**Sediment**	**TOC 5**	**06/17/13**	**06/17/13 18:28**	**D0617TOCS1**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.1700	3.000	3.360	106	3.400	108	75-125	1	0-25	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	Extraction
		Method:	EPA 418.1M
Project: Berths 163-164			Page 2 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-06-0714-1	**Sediment**	**IR 2**	**06/12/13**	**06/12/13 12:00**	**130612S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TRPH	47.61	100.0	140.8	93	142.6	95	55-135	1	0-30	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
Project: Berths 163-164			Page 3 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-06-0714-1	**Sediment**	**GC 45**	**06/12/13**	**06/12/13 14:44**	**130612S03**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	11.22	400.0	364.9	88	376.4	91	64-130	3	0-15	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
Project: Berths 163-164			Page 4 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-06-0714-1	**Sediment**	**GCTQ 1**	**06/13/13**	**06/18/13 02:05**	**130613S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Allethrin	ND	5.000	1.801	36	2.050	41	25-200	13	0-30	
Bifenthrin	ND	5.000	3.142	63	3.422	68	25-200	9	0-30	
Cyfluthrin	ND	5.000	1.828	37	2.197	44	25-200	18	0-30	
Cypermethrin	ND	5.000	1.659	33	1.967	39	25-200	17	0-30	
Deltamethrin/Tralomethrin	ND	5.000	2.381	48	2.763	55	25-200	15	0-30	
Fenpropathrin	ND	5.000	2.961	59	3.006	60	25-200	2	0-30	
Fenvalerate/Esfenvalerate	ND	10.00	3.912	39	4.777	48	25-200	20	0-30	
Fluvalinate	ND	5.000	1.709	34	2.218	44	25-200	26	0-30	
Permethrin (cis/trans)	3.251	5.000	8.042	96	8.269	100	25-200	3	0-30	
Phenothrin	ND	5.000	6.554	131	6.613	132	25-200	1	0-30	
Resmethrin/Bioresmethrin	ND	5.000	4.612	92	5.264	105	25-200	13	0-30	
Tetramethrin	ND	5.000	4.514	90	4.959	99	25-200	9	0-30	
lambda-Cyhalothrin	ND	5.000	2.236	45	2.579	52	25-200	14	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
Project: Berths 163-164			Page 5 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-06-0714-1	**Sediment**	**ICP/MS 03**	**06/12/13**	**06/12/13 13:12**	**130612S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Arsenic	6.397	25.00	32.31	104	30.28	96	80-120	6	0-20	
Cadmium	0.3433	25.00	26.25	104	26.23	104	80-120	0	0-20	
Chromium	25.70	25.00	48.73	92	48.97	93	80-120	0	0-20	
Copper	43.80	25.00	69.07	101	65.70	88	80-120	5	0-20	
Lead	20.19	25.00	47.41	109	45.84	103	80-120	3	0-20	
Nickel	19.90	25.00	44.82	100	43.32	94	80-120	3	0-20	
Selenium	0.1725	25.00	25.00	99	24.20	96	80-120	3	0-20	
Silver	0.1332	12.50	12.99	103	12.63	100	80-120	3	0-20	
Zinc	81.97	25.00	113.7	127	109.7	111	80-120	4	0-20	3

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: Berths 163-164			Page 6 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-06-0714-1	**Sediment**	**Mercury**	**06/12/13**	**06/12/13 13:24**	**130612S05**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	0.1584	0.8350	0.9514	95	0.9984	101	76-136	5	0-16	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
Project: Berths 163-164			Page 7 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
B163-164 COMP B	**Sediment**	**GC 51**	**06/12/13**	**06/14/13 17:53**	**130612S06B**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Aldrin	ND	5.000	4.432	89	4.299	86	50-135	3	0-25	
Alpha-BHC	ND	5.000	5.213	104	5.199	104	50-135	0	0-25	
Beta-BHC	ND	5.000	5.638	113	5.424	108	50-135	4	0-25	
Delta-BHC	ND	5.000	3.479	70	3.336	67	50-135	4	0-25	
Gamma-BHC	ND	5.000	3.738	75	3.546	71	50-135	5	0-25	
Dieldrin	ND	5.000	4.584	92	4.548	91	50-135	1	0-25	
4,4'-DDD	ND	5.000	8.514	170	8.376	168	50-135	2	0-25	3
4,4'-DDE	6.189	5.000	11.08	98	9.962	75	50-135	11	0-25	
4,4'-DDT	ND	5.000	2.776	56	2.253	45	50-135	21	0-25	3
Endosulfan I	ND	5.000	4.940	99	4.386	88	50-135	12	0-25	
Endosulfan II	ND	5.000	3.672	73	3.775	75	50-135	3	0-25	
Endosulfan Sulfate	ND	5.000	3.774	75	3.926	79	50-135	4	0-25	
Endrin	ND	5.000	4.470	89	4.667	93	50-135	4	0-25	
Endrin Aldehyde	ND	5.000	5.233	105	4.450	89	50-135	16	0-25	
Endrin Ketone	ND	5.000	2.514	50	2.695	54	50-135	7	0-25	
Heptachlor	ND	5.000	3.380	68	3.243	65	50-135	4	0-25	
Heptachlor Epoxide	ND	5.000	4.952	99	4.735	95	50-135	4	0-25	
Methoxychlor	ND	5.000	1.988	40	1.525	30	50-135	26	0-25	3,4
Alpha Chlordane	ND	5.000	4.376	88	4.177	84	50-135	5	0-25	
Gamma Chlordane	ND	5.000	4.575	91	4.465	89	50-135	2	0-25	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
Project: Berths 163-164			Page 8 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
B163-164 COMP B	**Sediment**	**GC/MS MM**	**06/17/13**	**06/19/13 16:27**	**130617S12A**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
2,4,6-Trichlorophenol	ND	1000	744.1	74	695.8	70	40-160	7	0-20	
2,4-Dichlorophenol	ND	1000	713.8	71	655.7	66	40-160	8	0-20	
2-Methylphenol	ND	1000	798.4	80	718.9	72	40-160	10	0-20	
2-Nitrophenol	ND	1000	762.9	76	688.3	69	40-160	10	0-20	
4-Chloro-3-Methylphenol	ND	1000	719.7	72	646.5	65	40-160	11	0-20	
Acenaphthene	ND	1000	805.2	81	742.3	74	40-106	8	0-20	
Benzo (a) Pyrene	392.7	1000	1345	95	1190	80	17-163	12	0-20	
Chrysene	647.0	1000	1316	67	1141	49	17-168	14	0-20	
Di-n-Butyl Phthalate	ND	1000	566.1	57	558.6	56	40-160	1	0-20	
Dimethyl Phthalate	ND	1000	699.4	70	643.1	64	40-160	8	0-20	
Fluoranthene	302.6	1000	1143	84	1071	77	26-137	6	0-20	
Fluorene	ND	1000	789.7	79	750.4	75	59-121	5	0-20	
N-Nitrosodimethylamine	ND	1000	461.7	46	545.5	55	40-160	17	0-20	
Naphthalene	47.92	1000	795.4	75	716.8	67	21-133	10	0-20	
Phenanthrene	60.88	1000	949.5	89	1017	96	54-120	7	0-20	
Phenol	ND	1000	662.0	66	535.5	54	40-160	21	0-20	4
Pyrene	594.6	1000	1777	118	1662	107	6-156	7	0-46	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
Project: Berths 163-164			Page 9 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
B163-164 COMP B	**Sediment**	**GC/MS HHH**	**06/17/13**	**06/19/13 19:02**	**130617S13A**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
PCB008	ND	25.00	26.38	106	26.58	106	50-125	1	0-30	
PCB018	2.608	25.00	32.55	120	33.68	124	50-125	3	0-30	
PCB028	4.377	25.00	33.10	115	30.55	105	50-125	8	0-30	
PCB044	4.139	25.00	32.78	115	28.34	97	50-125	15	0-30	
PCB052	5.272	25.00	33.12	111	34.64	117	50-125	4	0-30	
PCB066	0.9498	25.00	30.75	119	29.70	115	50-125	3	0-30	
PCB077	ND	25.00	31.92	128	29.41	118	50-125	8	0-30	3
PCB101	3.629	25.00	40.10	146	32.22	114	50-125	22	0-30	3
PCB105	3.986	25.00	29.75	103	25.89	88	50-125	14	0-30	
PCB118	2.260	25.00	27.61	101	24.08	87	50-125	14	0-30	
PCB126	ND	25.00	26.30	105	21.79	87	50-125	19	0-30	
PCB128	0.9079	25.00	23.24	89	22.12	85	50-125	5	0-30	
PCB153	3.863	25.00	26.88	92	23.64	79	50-125	13	0-30	
PCB170	1.874	25.00	25.60	95	23.51	87	50-125	9	0-30	
PCB180	2.374	25.00	29.65	109	25.89	94	50-125	14	0-30	
PCB187	0.6506	25.00	23.68	92	21.59	84	50-125	9	0-30	
PCB195	ND	25.00	22.04	88	21.07	84	50-125	5	0-30	
PCB206	ND	25.00	21.50	86	20.41	82	50-125	5	0-30	
PCB209	ND	25.00	23.36	93	24.39	98	50-125	4	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B (M)
		Method:	Organotins by Krone et al.
Project: Berths 163-164			Page 10 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
B163-164 COMP B	**Sediment**	**GC/MS JJJ**	**06/12/13**	**06/14/13 14:10**	**130612S04**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	ND	100.0	83.38	83	90.79	91	79-175	9	0-31	
Tributyltin	20.64	100.0	83.02	62	94.35	74	69-135	13	0-29	3

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - PDS/PDSD

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
Project: Berths 163-164			Page 1 of 1

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number
13-06-0714-1	**Sediment**	**ICP/MS 03**	**06/12/13 00:00**	**06/12/13 13:19**	**130612S01**

Parameter	Sample Conc.	Spike Added	PDS Conc.	PDS %Rec.	%Rec. CL	Qualifiers
Arsenic	6.397	25.00	31.95	102	75-125	
Cadmium	0.3433	25.00	26.37	104	75-125	
Chromium	25.70	25.00	49.28	94	75-125	
Copper	43.80	25.00	69.37	102	75-125	
Lead	20.19	25.00	46.51	105	75-125	
Nickel	19.90	25.00	44.52	98	75-125	
Selenium	0.1725	25.00	26.56	106	75-125	
Silver	0.1332	12.50	10.84	86	75-125	
Zinc	81.97	25.00	109.5	110	75-125	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Sample Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 376.2M
Project: Berths 163-164			Page 1 of 3

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
B163-164 COMP B	**Sediment**	**N/A**	**06/17/13 00:00**	**06/17/13 14:45**	**D0617SD1**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Sulfide, Total	7.500	7.200	4	0-25	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Sample Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 376.2M
Project: Berths 163-164			Page 2 of 3

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
B163-164 COMP B	**Sediment**	**N/A**	**06/11/13 00:00**	**06/11/13 20:15**	**D0611DSD2**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Sulfide, Dissolved	ND	ND	N/A	0-25	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Sample Duplicate

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 2540 B (M)
Project: Berths 163-164			Page 3 of 3

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
13-06-0714-1	**Sediment**	**N/A**	**06/13/13 00:00**	**06/13/13 19:00**	**D0613TSD1**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Solids, Total	72.90	71.70	2	0-10	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 9060A
Project: Berths 163-164			Page 1 of 11

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-06-013-876	**Soil**	**TOC 5**	**06/17/13**	**06/17/13 18:28**	**D0617TOCL1**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.6000	0.6454	108	0.6268	104	80-120	3	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 4500-NH3 B/C (M)
Project: Berths 163-164			Page 2 of 11

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-816-61	**Soil**	**BUR05**	**06/19/13**	**06/19/13 14:00**	**D0619NH3L1**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Ammonia (as N)	5.000	4.340	87	4.270	85	80-120	2	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	Extraction
		Method:	EPA 418.1M
Project: Berths 163-164			Page 3 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-07-015-1928	**Soil**	**IR 2**	**06/12/13 12:00**	**130612L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
TRPH	100.0	94.86	95	70-130	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
Project: Berths 163-164			Page 4 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-15-490-359	**Soil**	**GC 45**	**06/12/13 14:28**	**130612B03**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
TPH as Diesel	400.0	359.7	90	75-123	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
Project: Berths 163-164			Page 5 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-403-34	**Sediment**	**GCTQ 1**	**06/17/13 21:49**	**130613L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Allethrin	5.000	2.443	49	25-200	0-229	
Bifenthrin	5.000	3.868	77	25-200	0-229	
Cyfluthrin	5.000	2.431	49	25-200	0-229	
Cypermethrin	5.000	2.309	46	25-200	0-229	
Deltamethrin/Tralomethrin	5.000	2.593	52	25-200	0-229	
Fenpropathrin	5.000	2.823	56	25-200	0-229	
Fenvalerate/Esfenvalerate	10.00	4.307	43	25-200	0-229	
Fluvalinate	5.000	2.334	47	25-200	0-229	
Permethrin (cis/trans)	5.000	3.977	80	25-200	0-229	
Phenothrin	5.000	4.836	97	25-200	0-229	
Resmethrin/Bioresmethrin	5.000	4.560	91	25-200	0-229	
Tetramethrin	5.000	3.101	62	25-200	0-229	
lambda-Cyhalothrin	5.000	1.978	40	25-200	0-229	

Total number of LCS compounds: 13
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
Project: Berths 163-164			Page 6 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-15-254-116	**Soil**	**ICP/MS 03**	**06/14/13 11:41**	**130612L01E**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Arsenic	25.00	25.82	103	80-120	
Cadmium	25.00	26.39	106	80-120	
Chromium	25.00	24.89	100	80-120	
Copper	25.00	27.39	110	80-120	
Lead	25.00	26.30	105	80-120	
Nickel	25.00	26.30	105	80-120	
Selenium	25.00	25.74	103	80-120	
Silver	12.50	10.82	87	80-120	
Zinc	25.00	28.07	112	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: Berths 163-164			Page 7 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-12-452-383	**Soil**	**Mercury**	**06/12/13 13:15**	**130612L05E**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.8350	0.8128	97	82-124	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
Project: Berths 163-164			Page 8 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-12-858-206	**Soil**	**GC 51**	**06/14/13 10:48**	**130612L06**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Aldrin	5.000	4.696	94	50-135	36-149	
Alpha-BHC	5.000	4.757	95	50-135	36-149	
Beta-BHC	5.000	4.549	91	50-135	36-149	
Delta-BHC	5.000	3.682	74	50-135	36-149	
Gamma-BHC	5.000	4.656	93	50-135	36-149	
Dieldrin	5.000	4.896	98	50-135	36-149	
4,4'-DDD	5.000	4.507	90	50-135	36-149	
4,4'-DDE	5.000	4.338	87	50-135	36-149	
4,4'-DDT	5.000	4.818	96	50-135	36-149	
Endosulfan I	5.000	5.422	108	50-135	36-149	
Endosulfan II	5.000	4.827	97	50-135	36-149	
Endosulfan Sulfate	5.000	4.706	94	50-135	36-149	
Endrin	5.000	4.626	93	50-135	36-149	
Endrin Aldehyde	5.000	5.179	104	50-135	36-149	
Endrin Ketone	5.000	5.280	106	50-135	36-149	
Heptachlor	5.000	4.954	99	50-135	36-149	
Heptachlor Epoxide	5.000	4.554	91	50-135	36-149	
Methoxychlor	5.000	4.869	97	50-135	36-149	
Alpha Chlordane	5.000	4.849	97	50-135	36-149	
Gamma Chlordane	5.000	4.794	96	50-135	36-149	

Total number of LCS compounds: 20
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
Project: Berths 163-164			Page 9 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-256-36	**Soil**	**GC/MS MM**	**06/18/13 17:28**	**130617L12**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
2,4,6-Trichlorophenol	1000	522.4	52	40-160	20-180	
2,4-Dichlorophenol	1000	488.3	49	40-160	20-180	
2-Methylphenol	1000	495.2	50	40-160	20-180	
2-Nitrophenol	1000	493.3	49	40-160	20-180	
4-Chloro-3-Methylphenol	1000	481.2	48	40-160	20-180	
Acenaphthene	1000	576.5	58	48-108	38-118	
Benzo (a) Pyrene	1000	732.7	73	17-163	0-187	
Chrysene	1000	657.9	66	17-168	0-193	
Di-n-Butyl Phthalate	1000	676.0	68	40-160	20-180	
Dimethyl Phthalate	1000	498.6	50	40-160	20-180	
Fluoranthene	1000	639.4	64	26-137	8-156	
Fluorene	1000	621.6	62	59-121	49-131	
N-Nitrosodimethylamine	1000	425.3	43	40-160	20-180	
Naphthalene	1000	515.8	52	21-133	2-152	
Phenanthrene	1000	606.8	61	54-120	43-131	
Phenol	1000	399.6	40	40-160	20-180	
Pyrene	1000	674.8	67	28-106	15-119	

Total number of LCS compounds: 17
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
Project: Berths 163-164			Page 10 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-341-105	**Soil**	**GC/MS HHH**	**06/19/13 17:37**	**130617L13**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
PCB008	25.00	21.62	86	50-125	38-138	
PCB018	25.00	24.45	98	50-125	38-138	
PCB028	25.00	26.24	105	50-125	38-138	
PCB044	25.00	25.48	102	50-125	38-138	
PCB052	25.00	24.02	96	50-125	38-138	
PCB066	25.00	27.89	112	50-125	38-138	
PCB077	25.00	27.16	109	50-125	38-138	
PCB101	25.00	26.27	105	50-125	38-138	
PCB105	25.00	26.00	104	50-125	38-138	
PCB118	25.00	28.80	115	50-125	38-138	
PCB126	25.00	24.46	98	50-125	38-138	
PCB128	25.00	24.30	97	50-125	38-138	
PCB153	25.00	24.92	100	50-125	38-138	
PCB170	25.00	23.41	94	50-125	38-138	
PCB180	25.00	25.18	101	50-125	38-138	
PCB187	25.00	24.28	97	50-125	38-138	
PCB195	25.00	21.40	86	50-125	38-138	
PCB206	25.00	24.91	100	50-125	38-138	
PCB209	25.00	20.53	82	50-125	38-138	

Total number of LCS compounds: 19
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/11/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0715
San Diego, CA 92123-4302		Preparation:	EPA 3550B (M)
		Method:	Organotins by Krone et al.
Project: Berths 163-164			Page 11 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-07-016-1032	**Soil**	**GC/MS JJJ**	**06/14/13 11:10**	**130612L04**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Tetrabutyltin	100.0	88.80	89	79-151	
Tributyltin	100.0	90.42	90	51-129	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order: 13-06-0715

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

For any analysis identified as a "field" test with a holding time (HT) </= 15 minutes where the sample is received outside of HT, Calscience will adhere to its internal HT of 24 hours. In cases where sample analysis does not meet Calscience's internal HT, results will be appropriately qualified.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE: 6/ 11 /2013

PAGE: 1 OF 2

LABORATORY CLIENT: AMEC

ADDRESS: 9210 Sky Park Ct # 200

CITY: San Diego, CA 92123

TEL: 858-449-2334 | E-Mail: tyler.huff@amec.com | E-MAIL:

CLIENT PROJECT NAME / NUMBER: Berths 163-164

PROJECT CONTACT: Barry Snyder/Tyler Huff

SAMPLER(S): (SIGNATURE)

P.O. NO.: 1015101930

QUOTE NO.:

LAB USE ONLY: 13-06-0715

TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48HR ☒ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY): ☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ____/____/____

SPECIAL INSTRUCTIONS
Danielle Gonsman is PM
Green Book Testing
Please see attached Sheet for Analysis.
Please report all applicable totals (i.e. PCBs, PAHs, etc.)

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Total Solids	Total Organic Carbon	Total Ammonia	Total and Dissolved Sulfides	Metals	TRPH	TPH	PAHs	Chlorinated Pesticides	PCB Congeners	Phenols	Pyrethroids	Phthalates	Organotins	Grainsize
	Composite Area A	Port of Los Angeles	6/ /13		sediment	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Composite Area A-Z	Port of Los Angeles	6/ /13		sediment	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Composite Area B	Port of Los Angeles	6/ /13		sediment	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Composite Area B-Z	Port of Los Angeles	6/ /13		sediment	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Reference	Port of Los Angeles	6/ /13		sediment	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1	B163-164 CompA	Port of LA	6/10/13	1500	sed	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	B163-164	"	6/10/13	1700	sed	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tyler Huff (AMEC)		06/11/13	1420
		06/11/13	1745
			1945

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Table 4-2.
Chemical Analyses for Elutriate, Sediment and Tissue Samples

Analyte	Analysis Method	Elutriate Target Detection Limits[a, b]	Sediment Target Detection Limits[a, b]	Tissue Target Detection Limits[a, b]
Total Solids	160.3/SM 2540 B	N/A	0.1 %	0.100 %
Total Organic Carbon	9060	N/A	0.1 %	N/A
Total Ammonia	SM 4500-NH3 B/C (M)/350.2M[c]	N/A	0.2 mg/kg	N/A
Total Sulfides	376.2M[c]	N/A	0.5 mg/kg	N/A
Soluble Sulfides	SM 4500 S2 – D[c]	N/A	0.5 mg/kg	N/A
Arsenic	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Cadmium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Chromium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.02 mg/kg
Copper	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Lead	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Mercury	7471A[d]	0.0002 mg/L	0.02 mg/kg	0.02 mg/kg
Nickel	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Selenium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Silver	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Zinc	6020/6010B[d]	0.005 mg/L	1.0 mg/kg	1.0 mg/kg
Total Lipids	NOAA 1993a[i]	N/A	N/A	0.1 %
TRPH	418.1M[d]	N/A	10 mg/kg	N/A
TPH (C6-C44)	8015B(M)/8015B[d]	N/A	5.0 mg/kg	N/A
PAHs[e]	8270C SIM/ GC/TQ[d]	0.2 µg/L	10 µg/kg	10 µg/kg
Chlorinated Pesticides[f]	8081A[d]	0.1 µg/L	1.0 – 20 µg/kg	0.5 - 20 µg/kg
PCB Congeners[g]	8270C SIM PCB[d]	0.02 µg/L	0.5 µg/kg	0.5 µg/kg
Phenols	8270C SIM[d]	N/A	20 – 100 µg/kg	N/A
Pyrethroids	GC/MS/MS[j]	N/A	0.5 – 1.0 µg/kg	N/A
Phthalates	8270C SIM[d]	N/A	10 µg/kg	N/A
Organotins	Rice/Krone[h]	3.0 ng/L	3.0 µg/kg	N/A

Notes:

[a] Sediment minimum detection limits are on a wet-weight basis. Tissue minimum levels are on a wet-weight basis.

[b] Reporting limits provided by Calscience Environmental Laboratories, Inc.

[c] Standard Methods for the Examination of Water and Wastewater, 19th Edition American Public Health Association et al. 1995.

[d] USEPA 1986-1996. SW-846. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition.

[e] Includes naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b,k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene.

[f] Includes aldrin, α-benzene hexachloride (BHC), β-BHC, γ-BHC (lindane), δ-BHC, chlordane, 2,4- and 4,4-dichlorodiphenyldichloroethane (DDD), 2,4- and 4,4-dichlorodiphenyldichloroethylene (DDE), 2,4- and 4,4-dichlorodiphenyltrichloroethane (DDT), dieldrin, endosulfan I and II, endosulfan sulfate, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, and toxaphene.

[g] PCBs (sum of 41 congeners: 18, 28, 37, 44, 49, 52, 66, 70, 74, 77, 81, 87, 99, 101, 105, 110, 114, 118, 119, 123, 126, 128, 138, 149, 151, 153, 156, 157, 158, 167, 168, 169, 170, 177, 180, 183, 187, 189, 194,201, and 206)

[h] Rice, C.D. et al. 1987, or similar (e.g. Krone et al. 1989)

[i] NOAA 1993

[j] Allethrin (Bioallethrin), Bifenthrin, Cyfluthrin-beta (Baythroid), Cyhalothrin-Lamba, Cypermethrin, Deltamethrin (Decamethrin), Esfenvalerate, Fenpropathrin (Danitol), Fenvalerate (sanmarton), Fluvalinate, Permethrin (cis and trans), Resmethrin (Bioresmethrin), Resmethrin, Sumithrin (Phenothrin}, Tetramethrin, and Tralomethrin

µg/kg - micrograms per kilogram (parts per billion)
µg/L - micrograms per liter
mg/kg - milligrams per kilogram (parts per million)
mg/L - milligrams per liter
ng/L - nanograms per liter
N/A - not applicable
PAH - polycyclic aromatic hydrocarbon
PCB - polychlorinated biphenyl
SM - Standard Methods
SOP - standard operating procedure
TPH - total petroleum hydrocarbons
TRPH - total recoverable petroleum hydrocarbons

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-06-0715

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: AMEC

DATE: 06/11/13

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 1.6 °C - 0.2 °C (CF) = 1.4 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter Initial: VG

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: VG

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: JD

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑ 6/11/13 JD	☐	☐
Sample container label(s) consistent with COC	☑	☑	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☑ 6/11/13	☑	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☑8ozCGJ ☑16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑Z_____

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐1PBna ☐500PB ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PJ ☐100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** JD

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** VC

Preservative: h: HCL n: HNO_3 na_2: $Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 u: Ultra-pure znna: $ZnAc_2$+NaOH f: Filtered **Scanned by:** VC

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-06-0715

SAMPLE ANOMALY FORM

SAMPLES - CONTAINERS & LABELS: | **Comments:**

- ☐ **Sample(s) NOT RECEIVED but listed on COC**
- ☐ **Sample(s) received but NOT LISTED on COC**
- ☐ **Holding time expired** – list sample ID(s) and test
- ☐ **Insufficient quantities for analysis** – list test
- ☐ **Improper container(s) used** – list test
- ☐ **Improper preservative used** – list test
- ☐ **No preservative noted on COC or label** – list test & notify lab
- ☐ **Sample labels illegible** – note test/container type
- ☑ **Sample label(s) do not match COC** – Note in comments
  - ☑ **Sample ID**
  - ☐ **Date and/or Time Collected**
  - ☐ **Project Information**
  - ☐ **# of Container(s)**
  - ☐ **Analysis**
- ☐ **Sample container(s) compromised** – Note in comments
  - ☐ **Water present in sample container**
  - ☐ **Broken**
- ☐ **Sample container(s) not labeled**
- ☐ **Air sample container(s) compromised** – Note in comments
  - ☐ **Flat**
  - ☐ **Very low in volume**
  - ☐ **Leaking (Not transferred - duplicate bag submitted)**
  - ☐ **Leaking (transferred into Calscience Tedlar® Bag*)**
  - ☐ **Leaking (transferred into Client's Tedlar® Bag*)**
- ☐ **Other:** _____

(-2) Sample ID per label is B1163-164 B-Comp 6/10/13 17:00

HEADSPACE – Containers with Bubble > 6mm or ¼ inch:

Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Cont. received	Analysis

Comments: _____

*Transferred at Client's request.

Initial / Date: JD 06/11/13

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Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 13-06-0316

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: AMEC Environment & Infrastructure

Client Project Name: POLA_YTI_B214-220

Attention: Tyler Huff
9210 Sky Park Court, Suite 200
San Diego, CA 92123-4302

Approved for release on 06/20/2013 by:
Danielle Gonsman
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Calscience Environmental Laboratories, Inc.

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Work Order Number: 13-06-0316

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Calscience Environmental Laboratories, Inc.

CASE NARRATIVE

Calscience Work Order No.: 13-06-0316
Project ID: POLA YTI- BERTH 214-220

Provided below is a narrative of our analytical effort, including any unique features or anomalies encountered as part of the analysis of the sediment and water samples.

Sample Condition on Receipt

One sediment sample was received for this project on June 5, 2013. The samples were transferred to the laboratory in an ice-chest with wet ice, following strict chain-of-custody (COC) procedures. The temperature of the sample upon receipt at the laboratory was 1.5°C. All samples were logged into the Laboratory Information Management System (LIMS), given laboratory identification numbers and then stored in refrigeration units pending chemistry.

COC discrepancies (if any) were noted in the Sample Anomaly Form.

Tests Performed

Sediment:

Total Solids by SM 2540B
Ammonia by SM 4500-NH3-B/C (M)
Grain Size by ASTM D4464
Dissolved and Total Sulfide by EPA 376.2M
TRPH by EPA 418.1M
TPH C6-C44 by EPA 8015B (M)
Total Organic Carbon by EPA 9060A
Trace Metals by EPA 6020/7471
Chlorinated Pesticides by EPA 8081A
PCB Congeners by EPA 8270C SIM
PAHs, Phenols and Phthalates by EPA 8270C SIM
Pyrethroids by EPA 8270D (M)/TQ/EI
Organotins by Krone et al.

Data Summary

The sediment sample was homogenized prior to analysis.

<u>Holding times</u>

All holding times were met.

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Blanks

Concentrations of target analytes in the method blank were found to be below reporting limits for all testing.

Reporting Limits

The Method Detection Limits were met.

Laboratory Control Samples

A Laboratory Control Sample (LCS) analysis was performed for each applicable test. All parameters were within established control limits.

Matrix Spikes

Matrix spiking was performed at the required frequencies for the sediment on the project sample. All matrix spike parameters outside the acceptable control limits were noted below.

The Tetrabutyltin MS and MSD recoveries were outside the control limits. The results have been flagged with the appropriate qualifiers.

Surrogates

Surrogate recoveries for all applicable tests and samples were within acceptable control limits.

Acronyms

LCS - Laboratory Control Sample
PDS - Post Digestion Spike
MS/MSD- Matrix Spike/Matrix Spike Duplicate
ME-Marginal Exceedance
RPD- Relative Percent Difference

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Calscience Environmental Laboratories, Inc.

Work Order Narrative

Work Order: 13-06-0316 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain of Custody (COC) on 06/05/13. They were assigned to Work Order 13-06-0316.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with an immediate holding time (HT </= 15 minutes --40CFR-136.3 Table II footnote 4), is considered a "field" test and reported samples results are not flagged unless the analysis is performed beyond 24 hours of the time of collection.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

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Calscience Environmental Laboratories, Inc.

Sample Summary

Client:	AMEC Environment & Infrastructure 9210 Sky Park Court, Suite 200 San Diego, CA 92123-4302	Work Order:	13-06-0316
		Project Name:	POLA_YTI_B214-220
		PO Number:	
		Date Received:	06/05/13
Attn:	Tyler Huff		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
Reference	13-06-0316-1	06/02/13 10:30	4	Soil

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	Extraction
		Method:	EPA 418.1M
		Units:	mg/kg
Project: POLA_YTI_B214-220			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-A**	**06/02/13 10:30**	**Soil**	**IR 2**	**06/12/13**	**06/12/13 12:00**	**130612L01**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
TRPH	18	14	1	

Method Blank	**099-07-015-1928**	**N/A**	**Soil**	**IR 2**	**06/12/13**	**06/12/13 12:00**	**130612L01**

Parameter	Result	RL	DF	Qualifiers
TRPH	ND	10	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: POLA_YTI_B214-220			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-B**	**06/02/13 10:30**	**Soil**	**GC 45**	**06/06/13**	**06/07/13 08:24**	**130606B02**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
C6	ND	7.0	1	
C7	ND	7.0	1	
C8	ND	7.0	1	
C9-C10	ND	7.0	1	
C11-C12	ND	7.0	1	
C13-C14	ND	7.0	1	
C15-C16	ND	7.0	1	
C17-C18	ND	7.0	1	
C19-C20	ND	7.0	1	
C21-C22	ND	7.0	1	
C23-C24	ND	7.0	1	
C25-C28	ND	7.0	1	
C29-C32	ND	7.0	1	
C33-C36	ND	7.0	1	
C37-C40	ND	7.0	1	
C41-C44	ND	7.0	1	
C6-C44 Total	ND	7.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	78	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: POLA_YTI_B214-220			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-490-352**	**N/A**	**Soil**	**GC 45**	**06/06/13**	**06/07/13 07:12**	**130606B02**

Parameter	Result	RL	DF	Qualifiers
C6	ND	5.0	1	
C7	ND	5.0	1	
C8	ND	5.0	1	
C9-C10	ND	5.0	1	
C11-C12	ND	5.0	1	
C13-C14	ND	5.0	1	
C15-C16	ND	5.0	1	
C17-C18	ND	5.0	1	
C19-C20	ND	5.0	1	
C21-C22	ND	5.0	1	
C23-C24	ND	5.0	1	
C25-C28	ND	5.0	1	
C29-C32	ND	5.0	1	
C33-C36	ND	5.0	1	
C37-C40	ND	5.0	1	
C41-C44	ND	5.0	1	
C6-C44 Total	ND	5.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	76	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-E**	**06/02/13 10:30**	**Soil**	**GCTQ 1**	**06/11/13**	**06/12/13 18:22**	**130611L01**

Comment(s): - Results are reported on a dry weight basis.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.70	0.36	1	
Bifenthrin	ND	0.70	0.13	1	
Cyfluthrin	ND	0.70	0.12	1	
Cypermethrin	ND	0.70	0.097	1	
Deltamethrin/Tralomethrin	ND	0.70	0.29	1	
Fenpropathrin	ND	0.70	0.051	1	
Fenvalerate/Esfenvalerate	ND	0.70	0.050	1	
Fluvalinate	ND	0.70	0.081	1	
Permethrin (cis/trans)	ND	1.4	0.16	1	
Phenothrin	ND	0.70	0.097	1	
Resmethrin/Bioresmethrin	ND	0.70	0.13	1	
Tetramethrin	ND	0.70	0.053	1	
lambda-Cyhalothrin	ND	0.70	0.061	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	66	25-200	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-403-33**	**N/A**	**Sediment**	**GCTQ 1**	**06/11/13**	**06/12/13 17:46**	**130611L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.50	0.26	1	
Bifenthrin	ND	0.50	0.094	1	
Cyfluthrin	ND	0.50	0.085	1	
Cypermethrin	ND	0.50	0.069	1	
Deltamethrin/Tralomethrin	ND	0.50	0.21	1	
Fenpropathrin	ND	0.50	0.036	1	
Fenvalerate/Esfenvalerate	ND	0.50	0.036	1	
Fluvalinate	ND	0.50	0.057	1	
Permethrin (cis/trans)	ND	1.0	0.11	1	
Phenothrin	ND	0.50	0.069	1	
Resmethrin/Bioresmethrin	ND	0.50	0.092	1	
Tetramethrin	ND	0.50	0.038	1	
lambda-Cyhalothrin	ND	0.50	0.044	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	65	25-200	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
		Units:	mg/kg
Project: POLA_YTI_B214-220			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-E**	**06/02/13 10:30**	**Soil**	**ICP/MS 03**	**06/06/13**	**06/07/13 14:16**	**130606L03E**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Arsenic	2.86	0.141	1	
Cadmium	0.195	0.141	1	
Chromium	21.3	0.141	1	
Copper	10.4	0.141	1	
Lead	5.37	0.141	1	
Nickel	10.9	0.141	1	
Selenium	0.322	0.141	1	
Silver	0.176	0.141	1	
Zinc	46.5	1.41	1	

Method Blank	**099-15-254-112**	**N/A**	**Soil**	**ICP/MS 03**	**06/06/13**	**06/06/13 16:57**	**130606L03E**

Parameter	Result	RL	DF	Qualifiers
Arsenic	ND	0.100	1	
Cadmium	ND	0.100	1	
Chromium	ND	0.100	1	
Copper	ND	0.100	1	
Lead	ND	0.100	1	
Nickel	ND	0.100	1	
Selenium	ND	0.100	1	
Silver	ND	0.100	1	
Zinc	ND	1.00	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
		Units:	mg/kg
Project: POLA_YTI_B214-220			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-E**	**06/02/13 10:30**	**Soil**	**Mercury**	**06/07/13**	**06/07/13 12:56**	**130607L01E**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0282	1	

Method Blank	**099-12-452-381**	**N/A**	**Soil**	**Mercury**	**06/07/13**	**06/07/13 12:52**	**130607L01E**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0200	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	ASTM D4464 (M)
		Units:	%
Project: POLA_YTI_B214-220			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-C**	**06/02/13 10:30**	**Soil**	**LPSA 1**	**N/A**	**06/09/13 16:39**	

Parameter	Result	Qualifiers
Clay (less than 0.00391mm)	7.24	
Silt (0.00391 to 0.0625mm)	31.59	
Total Silt and Clay (0 to 0.0625mm)	38.82	
Very Fine Sand (0.0625 to 0.125mm)	44.58	
Fine Sand (0.125 to 0.25mm)	16.59	
Medium Sand (0.25 to 0.5mm)	0.010	
Coarse Sand (0.5 to 1mm)	ND	
Very Coarse Sand (1 to 2mm)	ND	
Gravel (greater than 2mm)	ND	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-E**	**06/02/13 10:30**	**Soil**	**GC 51**	**06/06/13**	**06/07/13 14:26**	**130606L07**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Aldrin	ND	1.4	1	
Alpha-BHC	ND	1.4	1	
Beta-BHC	ND	1.4	1	
Delta-BHC	ND	1.4	1	
Gamma-BHC	ND	1.4	1	
Chlordane	ND	14	1	
Dieldrin	ND	1.4	1	
Trans-nonachlor	ND	1.4	1	
2,4'-DDD	ND	1.4	1	
2,4'-DDE	ND	1.4	1	
2,4'-DDT	ND	1.4	1	
4,4'-DDD	ND	1.4	1	
4,4'-DDE	2.6	1.4	1	
4,4'-DDT	ND	1.4	1	
Endosulfan I	ND	1.4	1	
Endosulfan II	ND	1.4	1	
Endosulfan Sulfate	ND	1.4	1	
Endrin	ND	1.4	1	
Endrin Aldehyde	ND	1.4	1	
Endrin Ketone	ND	1.4	1	
Heptachlor	ND	1.4	1	
Heptachlor Epoxide	ND	1.4	1	
Methoxychlor	ND	1.4	1	
Toxaphene	ND	28	1	
Alpha Chlordane	ND	1.4	1	
Gamma Chlordane	ND	1.4	1	
Cis-nonachlor	ND	1.4	1	
Oxychlordane	ND	1.4	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,5,6-Tetrachloro-m-Xylene	86	50-130	
Decachlorobiphenyl	82	50-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-858-203**	**N/A**	**Soil**	**GC 51**	**06/06/13**	**06/07/13 13:00**	**130606L07**

Parameter	Result	RL	DF	Qualifiers
Aldrin	ND	1.0	1	
Alpha-BHC	ND	1.0	1	
Beta-BHC	ND	1.0	1	
Delta-BHC	ND	1.0	1	
Gamma-BHC	ND	1.0	1	
Chlordane	ND	10	1	
Dieldrin	ND	1.0	1	
Trans-nonachlor	ND	1.0	1	
2,4'-DDD	ND	1.0	1	
2,4'-DDE	ND	1.0	1	
2,4'-DDT	ND	1.0	1	
4,4'-DDD	ND	1.0	1	
4,4'-DDE	ND	1.0	1	
4,4'-DDT	ND	1.0	1	
Endosulfan I	ND	1.0	1	
Endosulfan II	ND	1.0	1	
Endosulfan Sulfate	ND	1.0	1	
Endrin	ND	1.0	1	
Endrin Aldehyde	ND	1.0	1	
Endrin Ketone	ND	1.0	1	
Heptachlor	ND	1.0	1	
Heptachlor Epoxide	ND	1.0	1	
Methoxychlor	ND	1.0	1	
Toxaphene	ND	20	1	
Alpha Chlordane	ND	1.0	1	
Gamma Chlordane	ND	1.0	1	
Cis-nonachlor	ND	1.0	1	
Oxychlordane	ND	1.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,5,6-Tetrachloro-m-Xylene	105	50-130	
Decachlorobiphenyl	105	50-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-E**	**06/02/13 10:30**	**Soil**	**GC/MS MM**	**06/06/13**	**06/07/13 13:20**	**130606L10**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
1-Methylnaphthalene	ND	14	1	
2,4,5-Trichlorophenol	ND	14	1	
2,4,6-Trichlorophenol	ND	14	1	
2,4-Dichlorophenol	ND	14	1	
2,4-Dimethylphenol	ND	14	1	
2,4-Dinitrophenol	ND	700	1	
2-Chlorophenol	ND	14	1	
2-Methylnaphthalene	ND	14	1	
2-Methylphenol	ND	14	1	
2-Nitrophenol	ND	14	1	
3/4-Methylphenol	ND	14	1	
4,6-Dinitro-2-Methylphenol	ND	700	1	
4-Chloro-3-Methylphenol	ND	14	1	
4-Nitrophenol	ND	700	1	
Acenaphthene	ND	14	1	
Acenaphthylene	ND	14	1	
Anthracene	ND	14	1	
Benzo (a) Anthracene	ND	14	1	
Benzo (a) Pyrene	ND	14	1	
Benzo (b) Fluoranthene	ND	14	1	
Benzo (g,h,i) Perylene	ND	14	1	
Benzo (k) Fluoranthene	ND	14	1	
Bis(2-Ethylhexyl) Phthalate	14	14	1	
Butyl Benzyl Phthalate	ND	14	1	
Chrysene	ND	14	1	
Di-n-Butyl Phthalate	ND	14	1	
Di-n-Octyl Phthalate	ND	14	1	
Dibenz (a,h) Anthracene	ND	14	1	
Diethyl Phthalate	ND	14	1	
Dimethyl Phthalate	210	14	1	
Fluoranthene	ND	14	1	
Fluorene	ND	14	1	
Indeno (1,2,3-c,d) Pyrene	ND	14	1	
N-Nitrosodimethylamine	ND	14	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure	Date Received:	06/05/13
9210 Sky Park Court, Suite 200	Work Order:	13-06-0316
San Diego, CA 92123-4302	Preparation:	EPA 3545
	Method:	EPA 8270C SIM
	Units:	ug/kg
Project: POLA_YTI_B214-220		Page 2 of 4

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	14	1	
Pentachlorophenol	ND	700	1	
Phenanthrene	ND	14	1	
Phenol	33	14	1	
Pyrene	ND	14	1	
1,6,7-Trimethylnaphthalene	ND	14	1	
2,3,4,6-Tetrachlorophenol	ND	14	1	
2,6-Dichlorophenol	ND	14	1	
Benzoic Acid	ND	140	1	
DCPA	ND	14	1	
Dibenzothiophene	ND	14	1	
Perthane	ND	14	1	
1-Methylphenanthrene	ND	14	1	
Benzo (e) Pyrene	ND	14	1	
Perylene	ND	14	1	
Biphenyl	ND	14	1	
2,6-Dimethylnaphthalene	ND	14	1	
Isophorone	ND	140	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,6-Tribromophenol	95	32-143	
2-Fluorobiphenyl	63	14-146	
2-Fluorophenol	75	15-138	
Nitrobenzene-d5	60	18-162	
p-Terphenyl-d14	90	34-148	
Phenol-d6	87	17-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-256-35**	**N/A**	**Soil**	**GC/MS MM**	**06/06/13**	**06/07/13 12:29**	**130606L10**

Parameter	Result	RL	DF	Qualifiers
1-Methylnaphthalene	ND	10	1	
2,4,5-Trichlorophenol	ND	10	1	
2,4,6-Trichlorophenol	ND	10	1	
2,4-Dichlorophenol	ND	10	1	
2,4-Dimethylphenol	ND	10	1	
2,4-Dinitrophenol	ND	500	1	
2-Chlorophenol	ND	10	1	
2-Methylnaphthalene	ND	10	1	
2-Methylphenol	ND	10	1	
2-Nitrophenol	ND	10	1	
3/4-Methylphenol	ND	10	1	
4,6-Dinitro-2-Methylphenol	ND	500	1	
4-Chloro-3-Methylphenol	ND	10	1	
4-Nitrophenol	ND	500	1	
Acenaphthene	ND	10	1	
Acenaphthylene	ND	10	1	
Anthracene	ND	10	1	
Benzo (a) Anthracene	ND	10	1	
Benzo (a) Pyrene	ND	10	1	
Benzo (b) Fluoranthene	ND	10	1	
Benzo (g,h,i) Perylene	ND	10	1	
Benzo (k) Fluoranthene	ND	10	1	
Bis(2-Ethylhexyl) Phthalate	ND	10	1	
Butyl Benzyl Phthalate	ND	10	1	
Chrysene	ND	10	1	
Di-n-Butyl Phthalate	ND	10	1	
Di-n-Octyl Phthalate	ND	10	1	
Dibenz (a,h) Anthracene	ND	10	1	
Diethyl Phthalate	ND	10	1	
Dimethyl Phthalate	ND	10	1	
Fluoranthene	ND	10	1	
Fluorene	ND	10	1	
Indeno (1,2,3-c,d) Pyrene	ND	10	1	
N-Nitrosodimethylamine	ND	10	1	
Naphthalene	ND	10	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 4 of 4

Parameter	Result	RL	DF	Qualifiers
Pentachlorophenol	ND	500	1	
Phenanthrene	ND	10	1	
Phenol	ND	10	1	
Pyrene	ND	10	1	
1,6,7-Trimethylnaphthalene	ND	10	1	
2,3,4,6-Tetrachlorophenol	ND	10	1	
2,6-Dichlorophenol	ND	10	1	
Benzoic Acid	ND	100	1	
DCPA	ND	10	1	
Dibenzothiophene	ND	10	1	
Perthane	ND	10	1	
1-Methylphenanthrene	ND	10	1	
Benzo (e) Pyrene	ND	10	1	
Perylene	ND	10	1	
Biphenyl	ND	10	1	
2,6-Dimethylnaphthalene	ND	10	1	
Isophorone	ND	100	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,6-Tribromophenol	76	32-143	
2-Fluorobiphenyl	68	14-146	
2-Fluorophenol	72	15-138	
Nitrobenzene-d5	64	18-162	
p-Terphenyl-d14	77	34-148	
Phenol-d6	81	17-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-E**	**06/02/13 10:30**	**Soil**	**GC/MS HHH**	**06/06/13**	**06/07/13 19:55**	**130606L09**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
PCB018	ND	0.70	1	
PCB028	ND	0.70	1	
PCB037	ND	0.70	1	
PCB044	ND	0.70	1	
PCB049	ND	0.70	1	
PCB052	ND	0.70	1	
PCB066	ND	0.70	1	
PCB070	ND	0.70	1	
PCB074	ND	0.70	1	
PCB077	ND	0.70	1	
PCB081	ND	0.70	1	
PCB087	ND	0.70	1	
PCB099	ND	0.70	1	
PCB101	ND	0.70	1	
PCB105	ND	0.70	1	
PCB110	ND	0.70	1	
PCB114	ND	0.70	1	
PCB118	ND	0.70	1	
PCB119	ND	0.70	1	
PCB123	ND	0.70	1	
PCB126	ND	0.70	1	
PCB128	ND	0.70	1	
PCB138/158	ND	1.4	1	
PCB149	ND	0.70	1	
PCB151	ND	0.70	1	
PCB153	ND	0.70	1	
PCB156	ND	0.70	1	
PCB157	ND	0.70	1	
PCB167	ND	0.70	1	
PCB168	ND	0.70	1	
PCB169	ND	0.70	1	
PCB170	ND	0.70	1	
PCB177	ND	0.70	1	
PCB180	ND	0.70	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 2 of 4

Parameter	Result	RL	DF	Qualifiers
PCB183	ND	0.70	1	
PCB187	ND	0.70	1	
PCB189	ND	0.70	1	
PCB194	ND	0.70	1	
PCB201	ND	0.70	1	
PCB206	ND	0.70	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	121	50-125	
p-Terphenyl-d14	111	50-125	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-341-103**	**N/A**	**Soil**	**GC/MS HHH**	**06/06/13**	**06/07/13 16:42**	**130606L09**

Parameter	Result	RL	DF	Qualifiers
PCB018	ND	0.50	1	
PCB028	ND	0.50	1	
PCB037	ND	0.50	1	
PCB044	ND	0.50	1	
PCB049	ND	0.50	1	
PCB052	ND	0.50	1	
PCB066	ND	0.50	1	
PCB070	ND	0.50	1	
PCB074	ND	0.50	1	
PCB077	ND	0.50	1	
PCB081	ND	0.50	1	
PCB087	ND	0.50	1	
PCB099	ND	0.50	1	
PCB101	ND	0.50	1	
PCB105	ND	0.50	1	
PCB110	ND	0.50	1	
PCB114	ND	0.50	1	
PCB118	ND	0.50	1	
PCB119	ND	0.50	1	
PCB123	ND	0.50	1	
PCB126	ND	0.50	1	
PCB128	ND	0.50	1	
PCB138/158	ND	1.0	1	
PCB149	ND	0.50	1	
PCB151	ND	0.50	1	
PCB153	ND	0.50	1	
PCB156	ND	0.50	1	
PCB157	ND	0.50	1	
PCB167	ND	0.50	1	
PCB168	ND	0.50	1	
PCB169	ND	0.50	1	
PCB170	ND	0.50	1	
PCB177	ND	0.50	1	
PCB180	ND	0.50	1	
PCB183	ND	0.50	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 4 of 4

Parameter	Result	RL	DF	Qualifiers
PCB187	ND	0.50	1	
PCB189	ND	0.50	1	
PCB194	ND	0.50	1	
PCB201	ND	0.50	1	
PCB206	ND	0.50	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	82	50-125	
p-Terphenyl-d14	91	50-125	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3550B (M)
		Method:	Organotins by Krone et al.
		Units:	ug/kg
Project: POLA_YTI_B214-220			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Reference	**13-06-0316-1-E**	**06/02/13 10:30**	**Soil**	**GC/MS JJJ**	**06/06/13**	**06/12/13 13:40**	**130606L23**

Comment(s): - Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	ND	4.2	1	
Monobutyltin	ND	4.2	1	
Tetrabutyltin	ND	4.2	1	
Tributyltin	ND	4.2	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	80	48-126	

Method Blank	**099-07-016-1030**	**N/A**	**Soil**	**GC/MS JJJ**	**06/06/13**	**06/07/13 17:55**	**130606L23**

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	ND	3.0	1	
Monobutyltin	ND	3.0	1	
Tetrabutyltin	ND	3.0	1	
Tributyltin	ND	3.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	84	48-126	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure
9210 Sky Park Court, Suite 200
San Diego, CA 92123-4302
Project: POLA_YTI_B214-220

Date Received: 06/05/13
Work Order: 13-06-0316

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix
Reference	**13-06-0316-1**	**06/02/13 10:30**	**Soil**

Comment(s): (9) - Results are reported on a dry weight basis.

Parameter	Results	RL	DF	Qualifiers	Units	Date Prepared	Date Analyzed	Method
Sulfide, Total (9)	0.70	0.14	0.2		mg/kg	06/06/13	06/06/13	EPA 376.2M
Sulfide, Dissolved	ND	0.10	0.2		mg/kg	06/05/13	06/05/13	EPA 376.2M
Carbon, Total Organic (9)	0.77	0.070	1		%	06/11/13	06/12/13	EPA 9060A
Solids, Total	71.1	0.100	1		%	06/06/13	06/06/13	SM 2540 B (M)
Ammonia (as N) (9)	3.2	0.28	1		mg/kg	06/12/13	06/12/13	SM 4500-NH3 B/C (M)

Method Blank						**N/A**		**Soil**
Parameter	Results	RL	DF	Qualifiers	Units	Date Prepared	Date Analyzed	Method
Sulfide, Total	ND	0.10	0.2		mg/kg	06/06/13	06/06/13	EPA 376.2M
Sulfide, Dissolved	ND	0.10	0.2		mg/kg	06/05/13	06/05/13	EPA 376.2M
Carbon, Total Organic	ND	0.050	1		%	06/11/13	06/12/13	EPA 9060A
Solids, Total	ND	0.100	1		%	06/06/13	06/06/13	SM 2540 B (M)
Ammonia (as N)	ND	0.20	1		mg/kg	06/12/13	06/12/13	SM 4500-NH3 B/C (M)

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 9060A
Project: POLA_YTI_B214-220			Page 1 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**TOC 5**	**06/11/13**	**06/12/13 12:36**	**D0611TOCS2**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.5500	3.000	3.350	93	3.420	96	75-125	2	0-25	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	Extraction
		Method:	EPA 418.1M
Project: POLA_YTI_B214-220			Page 2 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-06-0714-1	**Sediment**	**IR 2**	**06/12/13**	**06/12/13 12:00**	**130612S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TRPH	47.61	100.0	140.8	93	142.6	95	55-135	1	0-30	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
Project: POLA_YTI_B214-220			Page 3 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**GC 45**	**06/06/13**	**06/07/13 07:48**	**130606S02**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	ND	400.0	401.0	100	398.0	100	64-130	1	0-15	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
Project: POLA_YTI_B214-220			Page 4 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**GCTQ 1**	**06/11/13**	**06/12/13 18:59**	**130611S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Allethrin	ND	5.000	1.689	34	1.695	34	25-200	0	0-30	
Bifenthrin	ND	5.000	2.866	57	2.786	56	25-200	3	0-30	
Cyfluthrin	ND	5.000	1.834	37	2.034	41	25-200	10	0-30	
Cypermethrin	ND	5.000	1.668	33	1.872	37	25-200	12	0-30	
Deltamethrin/Tralomethrin	ND	5.000	2.655	53	2.836	57	25-200	7	0-30	
Fenpropathrin	ND	5.000	2.861	57	2.872	57	25-200	0	0-30	
Fenvalerate/Esfenvalerate	ND	10.00	3.443	34	3.833	38	25-200	11	0-30	
Fluvalinate	ND	5.000	1.805	36	2.068	41	25-200	14	0-30	
Permethrin (cis/trans)	ND	5.000	3.717	74	4.067	81	25-200	9	0-30	
Phenothrin	ND	5.000	4.332	87	4.289	86	25-200	1	0-30	
Resmethrin/Bioresmethrin	ND	5.000	4.190	84	4.059	81	25-200	3	0-30	
Tetramethrin	ND	5.000	4.012	80	3.985	80	25-200	1	0-30	
lambda-Cyhalothrin	ND	5.000	1.487	30	1.655	33	25-200	11	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
Project: POLA_YTI_B214-220			Page 5 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**ICP/MS 03**	**06/06/13**	**06/06/13 17:06**	**130606S03**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Arsenic	2.035	25.00	27.40	101	27.44	102	80-120	0	0-20	
Cadmium	0.1388	25.00	26.06	104	26.12	104	80-120	0	0-20	
Chromium	15.12	25.00	39.49	97	40.38	101	80-120	2	0-20	
Copper	7.364	25.00	34.29	108	33.78	106	80-120	2	0-20	
Lead	3.817	25.00	29.80	104	30.03	105	80-120	1	0-20	
Nickel	7.717	25.00	33.64	104	33.57	103	80-120	0	0-20	
Selenium	0.2289	25.00	26.38	105	27.07	107	80-120	3	0-20	
Silver	0.1249	12.50	13.45	107	13.35	106	80-120	1	0-20	
Zinc	33.07	25.00	61.56	114	63.00	120	80-120	2	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POLA_YTI_B214-220			Page 6 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**Mercury**	**06/07/13**	**06/07/13 13:03**	**130607S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.8350	0.8865	106	0.8988	108	76-136	1	0-16	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
Project: POLA_YTI_B214-220			Page 7 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**GC 51**	**06/06/13**	**06/07/13 14:55**	**130606S07A**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Aldrin	ND	5.000	3.251	65	3.438	69	50-135	6	0-25	
Alpha-BHC	ND	5.000	5.616	112	6.303	126	50-135	12	0-25	
Beta-BHC	ND	5.000	4.823	96	6.075	122	50-135	23	0-25	
Delta-BHC	ND	5.000	3.667	73	4.381	88	50-135	18	0-25	
Gamma-BHC	ND	5.000	4.310	86	4.899	98	50-135	13	0-25	
Dieldrin	ND	5.000	3.752	75	4.161	83	50-135	10	0-25	
4,4'-DDD	ND	5.000	4.038	81	4.500	90	50-135	11	0-25	
4,4'-DDE	1.826	5.000	5.372	71	6.098	85	50-135	13	0-25	
4,4'-DDT	ND	5.000	3.499	70	2.729	55	50-135	25	0-25	
Endosulfan I	ND	5.000	3.192	64	3.568	71	50-135	11	0-25	
Endosulfan II	ND	5.000	3.589	72	4.118	82	50-135	14	0-25	
Endosulfan Sulfate	ND	5.000	3.742	75	4.220	84	50-135	12	0-25	
Endrin	ND	5.000	4.097	82	4.434	89	50-135	8	0-25	
Endrin Aldehyde	ND	5.000	3.325	67	3.729	75	50-135	11	0-25	
Endrin Ketone	ND	5.000	3.955	79	4.184	84	50-135	6	0-25	
Heptachlor	ND	5.000	4.140	83	4.272	85	50-135	3	0-25	
Heptachlor Epoxide	ND	5.000	3.786	76	4.233	85	50-135	11	0-25	
Methoxychlor	ND	5.000	3.799	76	2.991	60	50-135	24	0-25	
Alpha Chlordane	ND	5.000	4.068	81	4.226	85	50-135	4	0-25	
Gamma Chlordane	ND	5.000	5.180	104	5.994	120	50-135	15	0-25	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
Project: POLA_YTI_B214-220			Page 8 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**GC/MS MM**	**06/06/13**	**06/07/13 13:46**	**130606S10A**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
2,4,6-Trichlorophenol	ND	1000	887.2	89	892.6	89	40-160	1	0-20	
2,4-Dichlorophenol	ND	1000	774.8	77	742.5	74	40-160	4	0-20	
2-Methylphenol	ND	1000	797.0	80	795.3	80	40-160	0	0-20	
2-Nitrophenol	ND	1000	785.4	79	751.0	75	40-160	4	0-20	
4-Chloro-3-Methylphenol	ND	1000	877.9	88	833.3	83	40-160	5	0-20	
Acenaphthene	ND	1000	735.6	74	747.4	75	40-106	2	0-20	
Benzo (a) Pyrene	ND	1000	969.4	97	957.1	96	17-163	1	0-20	
Chrysene	ND	1000	866.0	87	857.3	86	17-168	1	0-20	
Di-n-Butyl Phthalate	ND	1000	804.3	80	799.4	80	40-160	1	0-20	
Dimethyl Phthalate	147.9	1000	975.4	83	975.3	83	40-160	0	0-20	
Fluoranthene	ND	1000	832.0	83	817.8	82	26-137	2	0-20	
Fluorene	ND	1000	792.9	79	798.2	80	59-121	1	0-20	
N-Nitrosodimethylamine	ND	1000	563.9	56	558.7	56	40-160	1	0-20	
Naphthalene	ND	1000	697.2	70	653.8	65	21-133	6	0-20	
Phenanthrene	ND	1000	802.7	80	789.8	79	54-120	2	0-20	
Phenol	23.16	1000	649.3	63	663.1	64	40-160	2	0-20	
Pyrene	ND	1000	858.4	86	849.4	85	6-156	1	0-46	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
Project: POLA_YTI_B214-220			Page 9 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**GC/MS HHH**	**06/06/13**	**06/11/13 21:29**	**130606S09A**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
PCB018	ND	25.00	18.68	75	16.45	66	50-125	13	0-30	
PCB028	ND	25.00	21.04	84	18.49	74	50-125	13	0-30	
PCB044	ND	25.00	21.10	84	18.47	74	50-125	13	0-30	
PCB052	ND	25.00	20.58	82	17.74	71	50-125	15	0-30	
PCB066	ND	25.00	22.46	90	19.57	78	50-125	14	0-30	
PCB077	ND	25.00	22.56	90	19.52	78	50-125	14	0-30	
PCB101	ND	25.00	22.03	88	19.10	76	50-125	14	0-30	
PCB105	ND	25.00	22.59	90	19.41	78	50-125	15	0-30	
PCB118	ND	25.00	22.94	92	19.85	79	50-125	14	0-30	
PCB126	ND	25.00	21.01	84	18.14	73	50-125	15	0-30	
PCB128	ND	25.00	21.93	88	19.03	76	50-125	14	0-30	
PCB153	ND	25.00	21.30	85	18.24	73	50-125	16	0-30	
PCB170	ND	25.00	26.20	105	22.09	88	50-125	17	0-30	
PCB180	ND	25.00	22.42	90	19.27	77	50-125	15	0-30	
PCB187	ND	25.00	21.62	86	18.59	74	50-125	15	0-30	
PCB206	ND	25.00	28.31	113	23.87	95	50-125	17	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3550B (M)
		Method:	Organotins by Krone et al.
Project: POLA_YTI_B214-220			Page 10 of 10

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Reference	**Soil**	**GC/MS JJJ**	**06/06/13**	**06/12/13 14:09**	**130606S23A**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	ND	100.0	46.28	46	52.45	52	79-175	12	0-31	3
Tributyltin	ND	100.0	116.1	116	112.3	112	69-135	3	0-29	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - PDS/PDSD

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
Project: POLA_YTI_B214-220			Page 1 of 1

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number
Reference	**Soil**	**ICP/MS 03**	**06/06/13 00:00**	**06/06/13 17:12**	**130606S03**

Parameter	Sample Conc.	Spike Added	PDS Conc.	PDS %Rec.	%Rec. CL	Qualifiers
Arsenic	2.035	25.00	28.11	104	75-125	
Cadmium	0.1388	25.00	25.07	100	75-125	
Chromium	15.12	25.00	39.54	98	75-125	
Copper	7.364	25.00	34.56	109	75-125	
Lead	3.817	25.00	29.60	103	75-125	
Nickel	7.717	25.00	33.66	104	75-125	
Selenium	0.2289	25.00	25.94	103	75-125	
Silver	0.1249	12.50	10.74	85	75-125	
Zinc	33.07	25.00	63.41	121	75-125	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Sample Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 376.2M
Project: POLA_YTI_B214-220			Page 1 of 3

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
Reference	**Soil**	**N/A**	**06/06/13 00:00**	**06/06/13 12:30**	**D0606SD1**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Sulfide, Total	0.5000	0.5000	0	0-25	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Sample Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 376.2M
Project: POLA_YTI_B214-220			Page 2 of 3

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
Reference	**Soil**	**N/A**	**06/05/13 00:00**	**06/05/13 20:10**	**D0605DSD2**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Sulfide, Dissolved	ND	ND	N/A	0-25	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Sample Duplicate

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 2540 B (M)
Project: POLA_YTI_B214-220			Page 3 of 3

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
Reference	**Soil**	**N/A**	**06/06/13 00:00**	**06/06/13 18:30**	**D0606TSD3**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Solids, Total	71.10	71.30	0	0-10	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	EPA 9060A
Project: POLA_YTI_B214-220			Page 1 of 11

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-06-013-872	**Soil**	**TOC 5**	**06/11/13**	**06/12/13 12:05**	**D0611TOCL1**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.6000	0.5254	88	0.5668	94	80-120	8	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 4500-NH3 B/C (M)
Project: POLA_YTI_B214-220			Page 2 of 11

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-816-60	**Soil**	**BUR05**	**06/12/13**	**06/12/13 13:45**	**D0612NH3L1**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Ammonia (as N)	10.00	8.960	90	8.680	87	80-120	3	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	Extraction
		Method:	EPA 418.1M
Project: POLA_YTI_B214-220			Page 3 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-07-015-1928	**Soil**	**IR 2**	**06/12/13 12:00**	**130612L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
TRPH	100.0	94.86	95	70-130	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
Project: POLA_YTI_B214-220			Page 4 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-15-490-352	**Soil**	**GC 45**	**06/07/13 07:30**	**130606B02**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
TPH as Diesel	400.0	415.1	104	75-123	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3540C
		Method:	EPA 8270D (M)/TQ/EI
Project: POLA_YTI_B214-220			Page 5 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-403-33	**Sediment**	**GCTQ 1**	**06/12/13 17:09**	**130611L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Allethrin	5.000	4.177	84	25-200	0-229	
Bifenthrin	5.000	3.866	77	25-200	0-229	
Cyfluthrin	5.000	3.305	66	25-200	0-229	
Cypermethrin	5.000	3.352	67	25-200	0-229	
Deltamethrin/Tralomethrin	5.000	3.670	73	25-200	0-229	
Fenpropathrin	5.000	3.686	74	25-200	0-229	
Fenvalerate/Esfenvalerate	10.00	6.106	61	25-200	0-229	
Fluvalinate	5.000	3.784	76	25-200	0-229	
Permethrin (cis/trans)	5.000	3.826	77	25-200	0-229	
Phenothrin	5.000	4.621	92	25-200	0-229	
Resmethrin/Bioresmethrin	5.000	4.709	94	25-200	0-229	
Tetramethrin	5.000	3.533	71	25-200	0-229	
lambda-Cyhalothrin	5.000	3.243	65	25-200	0-229	

Total number of LCS compounds: 13
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3050B
		Method:	EPA 6020
Project: POLA_YTI_B214-220			Page 6 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-15-254-112	**Soil**	**ICP/MS 03**	**06/06/13 17:03**	**130606L03E**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Arsenic	25.00	24.75	99	80-120	
Cadmium	25.00	24.56	98	80-120	
Chromium	25.00	24.95	100	80-120	
Copper	25.00	26.62	106	80-120	
Lead	25.00	25.25	101	80-120	
Nickel	25.00	25.85	103	80-120	
Selenium	25.00	24.25	97	80-120	
Silver	12.50	10.51	84	80-120	
Zinc	25.00	27.25	109	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POLA_YTI_B214-220			Page 7 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-12-452-381	**Soil**	**Mercury**	**06/07/13 12:54**	**130607L01E**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.8350	0.8366	100	82-124	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8081A
Project: POLA_YTI_B214-220			Page 8 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-12-858-203	**Soil**	**GC 51**	**06/07/13 13:14**	**130606L07**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Aldrin	5.000	3.408	68	50-135	36-149	
Alpha-BHC	5.000	3.192	64	50-135	36-149	
Beta-BHC	5.000	2.987	60	50-135	36-149	
Delta-BHC	5.000	2.644	53	50-135	36-149	
Gamma-BHC	5.000	3.179	64	50-135	36-149	
Dieldrin	5.000	3.204	64	50-135	36-149	
4,4'-DDD	5.000	3.357	67	50-135	36-149	
4,4'-DDE	5.000	3.355	67	50-135	36-149	
4,4'-DDT	5.000	3.390	68	50-135	36-149	
Endosulfan I	5.000	3.336	67	50-135	36-149	
Endosulfan II	5.000	3.336	67	50-135	36-149	
Endosulfan Sulfate	5.000	3.223	64	50-135	36-149	
Endrin	5.000	3.664	73	50-135	36-149	
Endrin Aldehyde	5.000	2.749	55	50-135	36-149	
Endrin Ketone	5.000	3.412	68	50-135	36-149	
Heptachlor	5.000	3.330	67	50-135	36-149	
Heptachlor Epoxide	5.000	3.166	63	50-135	36-149	
Methoxychlor	5.000	3.516	70	50-135	36-149	
Alpha Chlordane	5.000	3.214	64	50-135	36-149	
Gamma Chlordane	5.000	3.231	65	50-135	36-149	

Total number of LCS compounds: 20
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM
Project: POLA_YTI_B214-220			Page 9 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-256-35	**Soil**	**GC/MS MM**	**06/07/13 12:54**	**130606L10**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
2,4,6-Trichlorophenol	1000	614.2	61	40-160	20-180	
2,4-Dichlorophenol	1000	599.4	60	40-160	20-180	
2-Methylphenol	1000	614.7	61	40-160	20-180	
2-Nitrophenol	1000	605.2	61	40-160	20-180	
4-Chloro-3-Methylphenol	1000	571.3	57	40-160	20-180	
Acenaphthene	1000	725.7	73	48-108	38-118	
Benzo (a) Pyrene	1000	955.4	96	17-163	0-187	
Chrysene	1000	813.7	81	17-168	0-193	
Di-n-Butyl Phthalate	1000	852.0	85	40-160	20-180	
Dimethyl Phthalate	1000	580.4	58	40-160	20-180	
Fluoranthene	1000	793.7	79	26-137	8-156	
Fluorene	1000	756.7	76	59-121	49-131	
N-Nitrosodimethylamine	1000	616.2	62	40-160	20-180	
Naphthalene	1000	698.5	70	21-133	2-152	
Phenanthrene	1000	764.6	76	54-120	43-131	
Phenol	1000	482.1	48	40-160	20-180	
Pyrene	1000	806.8	81	28-106	15-119	

Total number of LCS compounds: 17
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
Project: POLA_YTI_B214-220			Page 10 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-341-103	**Soil**	**GC/MS HHH**	**06/07/13 16:11**	**130606L09**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
PCB018	25.00	18.33	73	50-125	38-138	
PCB028	25.00	18.81	75	50-125	38-138	
PCB044	25.00	18.82	75	50-125	38-138	
PCB052	25.00	17.72	71	50-125	38-138	
PCB066	25.00	18.01	72	50-125	38-138	
PCB077	25.00	18.83	75	50-125	38-138	
PCB101	25.00	18.37	73	50-125	38-138	
PCB105	25.00	17.03	68	50-125	38-138	
PCB118	25.00	19.39	78	50-125	38-138	
PCB126	25.00	15.63	63	50-125	38-138	
PCB128	25.00	16.38	66	50-125	38-138	
PCB153	25.00	16.51	66	50-125	38-138	
PCB170	25.00	16.56	66	50-125	38-138	
PCB180	25.00	16.53	66	50-125	38-138	
PCB187	25.00	15.19	61	50-125	38-138	
PCB206	25.00	16.98	68	50-125	38-138	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	06/05/13
9210 Sky Park Court, Suite 200		Work Order:	13-06-0316
San Diego, CA 92123-4302		Preparation:	EPA 3550B (M)
		Method:	Organotins by Krone et al.
Project: POLA_YTI_B214-220			Page 11 of 11

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-07-016-1030	**Soil**	**GC/MS JJJ**	**06/10/13 12:32**	**130606L23**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Tetrabutyltin	100.0	100.0	100	79-151	
Tributyltin	100.0	101.5	102	51-129	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order: 13-06-0316 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

For any analysis identified as a "field" test with a holding time (HT) </= 15 minutes where the sample is received outside of HT, Calscience will adhere to its internal HT of 24 hours. In cases where sample analysis does not meet Calscience's internal HT, results will be appropriately qualified.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 · FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE: 6/5/2013

PAGE: 1 OF 2

LABORATORY CLIENT: AMEC Earth & Environmental

ADDRESS: 9210 Sky Park Court, Suite 200

CITY: San Diego, CA 92123

TEL: 858-449-2334

E-MAIL: tyler.huff@amec.com

CLIENT PROJECT NAME / NUMBER: POLA_YTI_B214-220

PROJECT CONTACT: Tyler Huff

SAMPLER(S): (SIGNATURE)

P.O. NO.:

Temp Blank.:

LAB USE ONLY: 13-06-0316

TURNAROUND TIME

[ ] SAME DAY [ ] 24 HR [ ] 48HR [ ] 72 HR [X] 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

[ ] RWQCB REPORTING [ ] ARCHIVE SAMPLES UNTIL ____/____/____

SPECIAL INSTRUCTIONS:

Test sediment according to attached table.

Danielle Gonsman is PM

- Report all applicable totals.
- Report results in dry weight

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Attached Table	Grain Size ASTM D4464	COMMENTS
/	Reference	LA-2 Reference	6/2/2013	1030	SED	4	X	X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	6/5/13	10:30	Adrianne Cabe	6/5/13	10:30
Adrianne Cabe	6/5/13		[signature]	06/05/13	16:37
			[signature]	06/05/13	1930

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Table 4-2.
Chemical Analyses for Elutriate, Sediment and Tissue Samples

Analyte	Analysis Method	Elutriate Target Detection Limits[a, b]	Sediment Target Detection Limits[a, b]	Tissue Target Detection Limits[a, b]
Total Solids	160.3/SM 2540 B	N/A	0.1 %	0.100 %
Total Organic Carbon	9060	N/A	0.1 %	N/A
Total Ammonia	SM 4500-NH3 B/C (M)/350.2M[c]	N/A	0.2 mg/kg	N/A
Total Sulfides	376.2M[c]	N/A	0.5 mg/kg	N/A
Soluble Sulfides	SM 4500 S2 – D[c]	N/A	0.5 mg/kg	N/A
Arsenic	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Cadmium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Chromium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.02 mg/kg
Copper	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Lead	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Mercury	7471A[d]	0.0002 mg/L	0.02 mg/kg	0.02 mg/kg
Nickel	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Selenium	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Silver	6020/6010B[d]	0.001 mg/L	0.1 mg/kg	0.1 mg/kg
Zinc	6020/6010B[d]	0.005 mg/L	1.0 mg/kg	1.0 mg/kg
Total Lipids	NOAA 1993a[i]	N/A	N/A	0.1 %
TRPH	418.1M[d]	N/A	10 mg/kg	N/A
TPH (C6-C44)	8015B(M)/8015B[d]	N/A	5.0 mg/kg	N/A
PAHs[e]	8270C SIM/ GC/TQ[d]	0.2 µg/L	10 µg/kg	10 µg/kg
Chlorinated Pesticides[f]	8081A[d]	0.1 µg/L	1.0 – 20 µg/kg	0.5 - 20 µg/kg
PCB Congeners[g]	8270C SIM PCB[d]	0.02 µg/L	0.5 µg/kg	0.5 µg/kg
Phenols	8270C SIM[d]	N/A	20 – 100 µg/kg	N/A
Pyrethroids	GC/MS/MS[j]	N/A	0.5 – 1.0 µg/kg	N/A
Phthalates	8270C SIM[d]	N/A	10 µg/kg	N/A
Organotins	Rice/Krone[h]	3.0 ng/L	3.0 µg/kg	N/A

Notes: Grain Size ASTM D464

a Sediment minimum detection limits are on a wet-weight basis. Tissue minimum levels are on a wet-weight basis.
b Reporting limits provided by Calscience Environmental Laboratories, Inc.
c Standard Methods for the Examination of Water and Wastewater, 19th Edition American Public Health Association et al. 1995.
d USEPA 1986-1996. SW-846. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition.
e Includes naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b,k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene.
f Includes aldrin, α-benzene hexachloride (BHC), β-BHC, γ-BHC (lindane), δ-BHC, chlordane, 2,4- and 4,4-dichlorodiphenyldichloroethane (DDD), 2,4- and 4,4-dichlorodiphenyldichloroethylene (DDE), 2,4- and 4,4-dichlorodiphenyltrichloroethane (DDT), dieldrin, endosulfan I and II, endosulfan sulfate, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, and toxaphene.
g PCBs (sum of 41 congeners: 18, 28, 37, 44, 49, 52, 66, 70, 74, 77, 81, 87, 99, 101, 105, 110, 114, 118, 119, 123, 126, 128, 138, 149, 151, 153, 156, 157, 158, 167, 168, 169, 170, 177, 180, 183, 187, 189, 194,201, and 206)
h Rice, C.D. et al. 1987, or similar (e.g. Krone et al. 1989)
i NOAA 1993
j Allethrin (Bioallethrin), Bifenthrin, Cyfluthrin-beta (Baythroid), Cyhalothrin-Lamba, Cypermethrin, Deltamethrin (Decamethrin), Esfenvalerate, Fenpropathrin (Danitol), Fenvalerate (sanmarton), Fluvalinate, Permethrin (cis and trans), Resmethrin (Bioresmethrin), Resmethrin, Sumithrin (Phenothrin), Tetramethrin, and Tralomethrin

µg/kg - micrograms per kilogram (parts per billion)
µg/L - micrograms per liter
mg/kg - milligrams per kilogram (parts per million)
mg/L - milligrams per liter
ng/L - nanograms per liter
N/A - not applicable
PAH - polycyclic aromatic hydrocarbon
PCB - polychlorinated biphenyl
SM - Standard Methods
SOP - standard operating procedure
TPH - total petroleum hydrocarbons
TRPH - total recoverable petroleum hydrocarbons

*pyrethroids are highlighted because there was a change from the SAP. All analytes on this table should be measured.

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-06-0316

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: AMEC

DATE: 06/05/13

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 1.7 °C - 0.2 °C (CF) = 1.5 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter Initial: VB

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: VB

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: HH

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☑8ozCGJ ☑16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑ Z

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** HH

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** WL

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** WL

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APPENDIX D

ELUTRIATE CHEMISTRY

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DRAFT Port of Los Angeles Maintenance Dredging Project Elutriate Chemistry Data - Berths 163-164								
Analytical Method	**Compound Name**	**Type**	**CCC**	**CMC**	**Units**	**B 163-164 Site Water**	**Composite A Elutriate**	**Composite B Elutriate**
SM 2540 D	Total Suspended Solids	General Chemistry	·	·	mg/L	--	54	8.8
EPA 1640	Arsenic	Metals	**36**	**69**	µg/L	1.52	2.27	5.41
EPA 1640	Cadmium	Metals	**9.3**	**42**	µg/L	0.0675	0.124	0.145
EPA 1640	Chromium	Metals	·	·	µg/L	ND < 0.500	0.592	0.543
EPA 1640	Copper	Metals	**3.1**	**4.8**	µg/L	2.52	1.03	2.74
EPA 1640	Lead	Metals	**8.1**	**210**	µg/L	0.0874	0.436	0.423
EPA 7470A	Mercury	Metals	·	·	µg/L	ND < 0.0500	ND < 0.0500	ND < 0.0500
EPA 1640	Nickel	Metals	**8.2**	**74**	µg/L	0.607	1.01	1.03
EPA 1640	Selenium	Metals	**71**	**290**	µg/L	ND < 0.0500	0.367	0.573
EPA 1640	Silver	Metals	·	**1.9**	µg/L	ND < 0.0500	ND < 0.0500	ND < 0.0500
EPA 1640	Zinc	Metals	**81**	**90**	µg/L	8.27	6.71	16.9
EPA 8270C SIM PAHs	Naphthalene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	2-Methylnaphthalene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	1-Methylnaphthalene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Acenaphthylene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Acenaphthene	PAH	·	·	µg/L	ND < 0.20	0.70	ND < 0.20
EPA 8270C SIM PAHs	Fluorene	PAH	·	·	µg/L	ND < 0.20	0.54	ND < 0.20
EPA 8270C SIM PAHs	Phenanthrene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Anthracene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Fluoranthene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Pyrene	PAH	·	·	µg/L	ND < 0.20	0.41	ND < 0.20
EPA 8270C SIM PAHs	Benzo (a) Anthracene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Chrysene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Benzo (k) Fluoranthene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Benzo (b) Fluoranthene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Benzo (a) Pyrene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Indeno (1,2,3-c,d) Pyrene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Dibenz (a,h) Anthracene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Benzo (g,h,i) Perylene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Benzo (e) Pyrene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Perylene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Biphenyl	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	1-Methylphenanthrene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	2,6-Dimethylnaphthalene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	1,6,7-Trimethylnaphthalene	PAH	·	·	µg/L	ND < 0.20	ND < 0.20	ND < 0.20
EPA 8270C SIM PAHs	Total Detectable PAHs	PAH	·	·	µg/L	ND	1.65	ND
EPA 8081A	2,4'-DDD	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	2,4'-DDE	Chlorinated Pesticides	·	·	µg/L	0.17	ND < 0.010	ND < 0.010
EPA 8081A	2,4'-DDT	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	4,4'-DDD	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	4,4'-DDE	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	4,4'-DDT	Chlorinated Pesticides	**0.001**	**0.13**	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
	Total Detectable DDTs	Chlorinated Pesticides	**0.001**	**0.13**	µg/L	**0.17**	ND	ND
EPA 8081A	Aldrin	Chlorinated Pesticides	·	**1.3**	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Alpha-BHC	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Chlordane	Chlorinated Pesticides	**0.004**	**0.09**	µg/L	ND < 0.024	ND < 0.025	ND < 0.025
EPA 8081A	Beta-BHC	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Delta-BHC	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Gamma-BHC	Chlorinated Pesticides	·	**0.16**	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Alpha Chlordane	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Dieldrin	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Trans-nonachlor	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Endosulfan I	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Endosulfan II	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Endosulfan Sulfate	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Endrin	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Endrin Aldehyde	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Endrin Ketone	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Heptachlor	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Heptachlor Epoxide	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Methoxychlor	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Mirex	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Toxaphene	Chlorinated Pesticides	·	·	µg/L	ND < 0.12	ND < 0.12	ND < 0.12
EPA 8081A	Gamma Chlordane	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Cis-nonachlor	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8081A	Oxychlordane	Chlorinated Pesticides	·	·	µg/L	ND < 0.0096	ND < 0.010	ND < 0.010
EPA 8270C SIM PCB Congeners	PCB018	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB028	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB037	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB044	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB049	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB052	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB066	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB070	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB074	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB077	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB081	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB087	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB099	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB101	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB105	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB110	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB114	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB118	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB119	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB123	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB126	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB128	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB138/158	PCB Congeners	·	·	µg/L	ND < 0.040	ND < 0.040	ND < 0.040
EPA 8270C SIM PCB Congeners	PCB149	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB151	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020

EPA 8270C SIM PCB Congeners	PCB153	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB156	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB157	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB167	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB168	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB169	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB170	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB177	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB180	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB183	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB187	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB189	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB194	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB201	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
EPA 8270C SIM PCB Congeners	PCB206	PCB Congeners	·	·	µg/L	ND < 0.020	ND < 0.020	ND < 0.020
	Total Detectable PCBs	PCB Congeners	**0.03**	·	µg/L	ND	ND	ND
EPA 8270D (M)/TQ/EI	Allethrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Bifenthrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Cyfluthrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	lambda-Cyhalothrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Cypermethrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Deltamethrin/Tralomethrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Fenpropathrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Fenvalerate/Esfenvalerate	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Fluvalinate	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Permethrin (cis/trans)	Pyrethroids	·	·	µg/L	ND < 0.0040	ND < 0.0040	ND < 0.0040
EPA 8270D (M)/TQ/EI	Phenothrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Resmethrin/Bioresmethrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Tetramethrin	Pyrethroids	·	·	µg/L	ND < 0.0020	ND < 0.0020	ND < 0.0020
EPA 8270D (M)/TQ/EI	Total Pyrethroids	Pyrethroids	·	·	µg/L	ND	ND	ND
Organotins By Krone et al.	Dibutyltin	Organotins	·	·	ng/L	ND < 3.0	ND < 3.0	ND < 3.0
Organotins By Krone et al.	Monobutyltin	Organotins	·	·	ng/L	ND < 3.0	ND < 3.0	ND < 3.0
Organotins By Krone et al.	Tetrabutyltin	Organotins	·	·	ng/L	ND < 3.0	ND < 3.0	ND < 3.0
Organotins By Krone et al.	Tributyltin	Organotins	·	·	ng/L	ND < 3.0	ND < 3.0	ND < 3.0
	Total Organotins	Organotins	·	·	ng/L	ND	ND	ND

mg - miligram
µg - microgram
ng - nanogram
L - liter
ND - Non Detect
PAH - Polyaromatic hydrocarbon
PCB - Polychlorinated biphenyl
TPH - Total petroleum hydrocarbons
TRPH - Total recoverable petrolium hydrocarbons
CCC - criterion continuous concentration
CMC - criterion maximum concentration
Red Font indicates value higher than CCC
Red Underlined Font indicates value higher than CMC

Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 13-07-0378

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: AMEC Environment & Infrastructure

Client Project Name: POLA-B163-164 Terminal (Elutriate)

Attention: Barry Snyder
9210 Sky Park Court, Suite 200
San Diego, CA 92123-4302

Approved for release on 07/22/2013 by:
Danielle Gonsman
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Work Order Number: 13-07-0378

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Calscience Environmental Laboratories, Inc.

CASE NARRATIVE

Calscience Work Order No.: 13-07-0378
Project ID: POLA –B163-164 Terminal (Elutriate)

Provided below is a narrative of our analytical effort, including any unique features or anomalies encountered as part of the analysis of the sediment and water samples.

Sample Condition on Receipt

Two sediment samples were received for this project on July 3, 2013 under CEL Work Order #13-07-0299. The On-shore and Off-shore sitewater samples were received on June 25, 2013 under CEL Work Order #13-06-1678. The samples were transferred to the laboratory in an ice-chest with wet ice, following strict chain-of-custody (COC) procedures. The temperature of the samples upon receipt at the laboratory ranged from 2.0-4.6°C. All samples were logged into the Laboratory Information Management System (LIMS), given laboratory identification numbers and then stored in refrigeration units pending (EET) elutriate testing.

COC discrepancies (if any) were noted in the Sample Anomaly Form.

Elutriate Preparation

The elutriate sample(s) were prepared in accordance with the Effluent Elutriate Test as presented in the Inland Testing Manual (1998). This procedure is also referred to as the Modified Elutriate Test Procedure as presented by Palermo (1986).

Prior to use, all labware was thoroughly cleaned in accordance with standard laboratory operating procedures (detergent wash, acid bath, rinse and flush with D.I. water). In accordance with the method, a slurry concentration of 150 g/L (dry weight basis) was used. The calculated volumes of sediment (or treated sediment) and seawater from the site were mixed, aerated, then allowed to settle before the supernatant was siphoned for analysis. The particulars are described as follows.

At room temperature, the slurry mixture was mixed vigorously for 5 minutes in a large HDPE jar. Following mixing, the slurry was poured into a plastic 4-liter graduated cylinder. The slurry was aerated vigorously using compressed air delivered via Teflon tubing to the bottom of the cylinder for one hour, then allowed to settle for twenty-four hours. The supernatant was then siphoned off using Teflon tubing and collected in clean containers.

The supernatant was then filtered using a 0.45 micron filter (for metals) and centrifuged (for organics) and transferred to new plastic and glass containers. The samples were given a new COC (with a new collection date/time) and new laboratory identification numbers, logged in to LIMS and then stored in refrigeration units pending analysis.

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Tests Performed

Elutriate (EET):

Total Suspended Solids by SM 2540
Trace Metals by EPA 1640/7471
Chlorinated Pesticides by EPA 8081A
PCB Congeners by EPA 8270C SIM
PAHs by EPA 8270C SIM
Pyrethroids by EPA 8270D (M)/TQ/EI
Organotins by Krone et al.

Data Summary

Holding times

All holding times were met.

Calibration

Frequency and control criteria for initial and continuing calibration verifications were met.

Blanks

Concentrations of target analytes in the method blank were found to be below reporting limits for all testing.

Reporting Limits

The Method Detection Limits were met.

Laboratory Control Samples

A Laboratory Control Sample (LCS) analysis was performed for each applicable test. All parameters were within established control limits with the following exceptions.

For PAHs by EPA 8270C SIM, the Anthracene recovery was outside the standard control limits, but within the ME limits. Since one ME is allowed, the data are released with no further action.

Matrix Spikes

Due to limited volume, matrix spiking was performed only on the non-project samples.

Surrogates

Surrogate recoveries for all applicable tests and samples were within acceptable control limits.

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Acronyms

LCS - Laboratory Control Sample
PDS - Post Digestion Spike
MS/MSD- Matrix Spike/Matrix Spike Duplicate
ME-Marginal Exceedance
RPD- Relative Percent Difference

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Calscience Environmental Laboratories, Inc.

Work Order Narrative

Work Order: 13-07-0378 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain of Custody (COC) on 07/08/13. They were assigned to Work Order 13-07-0378.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with an immediate holding time (HT </= 15 minutes --40CFR-136.3 Table II footnote 4), is considered a "field" test and reported samples results are not flagged unless the analysis is performed beyond 24 hours of the time of collection.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

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Calscience Environmental Laboratories, Inc.

Sample Summary

Client:	AMEC Environment & Infrastructure 9210 Sky Park Court, Suite 200 San Diego, CA 92123-4302	Work Order:	13-07-0378
		Project Name:	POLA-B163-164 Terminal (Elutriate)
		PO Number:	
		Date Received:	07/08/13
Attn:	Barry Snyder		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
B163-164 Comp A MET	13-07-0378-1	07/06/13 14:00	9	Sea Water
B163-164 Comp B MET	13-07-0378-2	07/06/13 14:30	9	Sea Water
Elutriate Blank	13-07-0378-3	07/06/13 15:00	4	Sea Water

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 2540 D
		Units:	mg/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-H**	**07/06/13 14:00**	**Sea Water**	**N/A**	**07/09/13**	**07/09/13 20:10**	**D0709TSSL2**

Parameter	Result	RL	DF	Qualifiers
Solids, Total Suspended	54	1.0	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp B MET	**13-07-0378-2-G**	**07/06/13 14:30**	**Sea Water**	**N/A**	**07/09/13**	**07/09/13 20:10**	**D0709TSSL2**

Parameter	Result	RL	DF	Qualifiers
Solids, Total Suspended	8.8	1.0	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-09-010-6346**	**N/A**	**Aqueous**	**N/A**	**07/09/13**	**07/09/13 20:10**	**D0709TSSL2**

Parameter	Result	RL	DF	Qualifiers
Solids, Total Suspended	ND	1.0	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-C**	**07/06/13 14:00**	**Sea Water**	**GCTQ 1**	**07/09/13**	**07/10/13 00:45**	**130709L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.0020	0.0012	1	
Bifenthrin	ND	0.0020	0.00015	1	
Cyfluthrin	ND	0.0020	0.00069	1	
Cypermethrin	ND	0.0020	0.0016	1	
Deltamethrin/Tralomethrin	ND	0.0020	0.00047	1	
Fenpropathrin	ND	0.0020	0.00037	1	
Fenvalerate/Esfenvalerate	ND	0.0020	0.00074	1	
Fluvalinate	ND	0.0020	0.0015	1	
Permethrin (cis/trans)	ND	0.0040	0.0018	1	
Phenothrin	ND	0.0020	0.00072	1	
Resmethrin/Bioresmethrin	ND	0.0020	0.00014	1	
Tetramethrin	ND	0.0020	0.00074	1	
lambda-Cyhalothrin	ND	0.0020	0.00046	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	77	25-200	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp B MET	**13-07-0378-2-C**	**07/06/13 14:30**	**Sea Water**	**GCTQ 1**	**07/09/13**	**07/10/13 01:22**	**130709L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.0020	0.0012	1	
Bifenthrin	ND	0.0020	0.00015	1	
Cyfluthrin	ND	0.0020	0.00069	1	
Cypermethrin	ND	0.0020	0.0016	1	
Deltamethrin/Tralomethrin	ND	0.0020	0.00047	1	
Fenpropathrin	ND	0.0020	0.00037	1	
Fenvalerate/Esfenvalerate	ND	0.0020	0.00074	1	
Fluvalinate	ND	0.0020	0.0015	1	
Permethrin (cis/trans)	ND	0.0040	0.0018	1	
Phenothrin	ND	0.0020	0.00072	1	
Resmethrin/Bioresmethrin	ND	0.0020	0.00014	1	
Tetramethrin	ND	0.0020	0.00074	1	
lambda-Cyhalothrin	ND	0.0020	0.00046	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	81	25-200	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270D (M)/TQ/EI
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-553-9**	**N/A**	**Aqueous**	**GCTQ 1**	**07/09/13**	**07/09/13 22:55**	**130709L01**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Allethrin	ND	0.0020	0.0012	1	
Bifenthrin	ND	0.0020	0.00015	1	
Cyfluthrin	ND	0.0020	0.00069	1	
Cypermethrin	ND	0.0020	0.0016	1	
Deltamethrin/Tralomethrin	ND	0.0020	0.00047	1	
Fenpropathrin	ND	0.0020	0.00037	1	
Fenvalerate/Esfenvalerate	ND	0.0020	0.00074	1	
Fluvalinate	ND	0.0020	0.0015	1	
Permethrin (cis/trans)	ND	0.0040	0.0018	1	
Phenothrin	ND	0.0020	0.00072	1	
Resmethrin/Bioresmethrin	ND	0.0020	0.00014	1	
Tetramethrin	ND	0.0020	0.00074	1	
lambda-Cyhalothrin	ND	0.0020	0.00046	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
trans-Permethrin(C13)	114	25-200	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3005A Filt.
		Method:	EPA 1640
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-I**	**07/06/13 14:00**	**Sea Water**	**ICP/MS 05**	**07/11/13**	**07/12/13 20:02**	**130711L02F**

Parameter	Result	RL	DF	Qualifiers
Arsenic	2.27	0.0300	1	
Selenium	0.367	0.0500	1	

B163-164 Comp A MET	**13-07-0378-1-I**	**07/06/13 14:00**	**Sea Water**	**ICP/MS 05**	**07/11/13**	**07/12/13 11:39**	**130711L02F**

Parameter	Result	RL	DF	Qualifiers
Silver	ND	0.0500	1	

B163-164 Comp A MET	**13-07-0378-1-I**	**07/06/13 14:00**	**Sea Water**	**ICP/MS 05**	**07/11/13**	**07/11/13 20:37**	**130711L02F**

Parameter	Result	RL	DF	Qualifiers
Cadmium	0.124	0.0300	1	
Chromium	0.592	0.500	1	
Copper	1.03	0.0300	1	
Lead	0.436	0.0300	1	
Nickel	1.01	0.0500	1	
Zinc	6.71	0.500	1	

B163-164 Comp B MET	**13-07-0378-2-I**	**07/06/13 14:30**	**Sea Water**	**ICP/MS 05**	**07/11/13**	**07/12/13 20:07**	**130711L02F**

Parameter	Result	RL	DF	Qualifiers
Arsenic	5.41	0.0300	1	
Selenium	0.573	0.0500	1	

B163-164 Comp B MET	**13-07-0378-2-I**	**07/06/13 14:30**	**Sea Water**	**ICP/MS 05**	**07/11/13**	**07/12/13 11:41**	**130711L02F**

Parameter	Result	RL	DF	Qualifiers
Silver	ND	0.0500	1	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3005A Filt.
		Method:	EPA 1640
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp B MET	**13-07-0378-2-I**	**07/06/13 14:30**	**Sea Water**	**ICP/MS 05**	**07/11/13**	**07/11/13 20:44**	**130711L02F**

Parameter	Result	RL	DF	Qualifiers
Cadmium	0.145	0.0300	1	
Chromium	0.543	0.500	1	
Copper	2.74	0.0300	1	
Lead	0.423	0.0300	1	
Nickel	1.03	0.0500	1	
Zinc	16.9	0.500	1	

Method Blank	**099-13-067-340**	**N/A**	**Aqueous**	**ICP/MS 05**	**07/11/13**	**07/11/13 18:43**	**130711L02F**

Parameter	Result	RL	DF	Qualifiers
Arsenic	ND	0.0300	1	
Cadmium	ND	0.0300	1	
Chromium	ND	0.500	1	
Copper	ND	0.0300	1	
Lead	ND	0.0300	1	
Nickel	ND	0.0500	1	
Selenium	ND	0.0500	1	
Silver	ND	0.0500	1	
Zinc	ND	0.500	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 7470A Filt.
		Method:	EPA 7470A
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-I**	**07/06/13 14:00**	**Sea Water**	**Mercury**	**07/15/13**	**07/15/13 20:44**	**130715L04A**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0500	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp B MET	**13-07-0378-2-I**	**07/06/13 14:30**	**Sea Water**	**Mercury**	**07/15/13**	**07/15/13 20:46**	**130715L04A**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0500	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-510-368**	**N/A**	**Aqueous**	**Mercury**	**07/15/13**	**07/15/13 17:31**	**130715L04A**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0500	1	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8081A
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-D**	**07/06/13 14:00**	**Sea Water**	**GC 44**	**07/08/13**	**07/10/13 13:26**	**130708L12**

Parameter	Result	RL	DF	Qualifiers
Oxychlordane	ND	0.010	1	
Aldrin	ND	0.010	1	
Alpha Chlordane	ND	0.010	1	
Alpha-BHC	ND	0.010	1	
Beta-BHC	ND	0.010	1	
Chlordane	ND	0.025	1	
Cis-nonachlor	ND	0.010	1	
2,4'-DDD	ND	0.010	1	
4,4'-DDD	ND	0.010	1	
4,4'-DDE	ND	0.010	1	
2,4'-DDE	ND	0.010	1	
2,4'-DDT	ND	0.010	1	
4,4'-DDT	ND	0.010	1	
Delta-BHC	ND	0.010	1	
Dieldrin	ND	0.010	1	
Endosulfan I	ND	0.010	1	
Endosulfan II	ND	0.010	1	
Endosulfan Sulfate	ND	0.010	1	
Endrin	ND	0.010	1	
Endrin Aldehyde	ND	0.010	1	
Endrin Ketone	ND	0.010	1	
Gamma Chlordane	ND	0.010	1	
Gamma-BHC	ND	0.010	1	
Heptachlor	ND	0.010	1	
Heptachlor Epoxide	ND	0.010	1	
Methoxychlor	ND	0.010	1	
Mirex	ND	0.010	1	
Toxaphene	ND	0.12	1	
Trans-nonachlor	ND	0.010	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	86	50-150	
2,4,5,6-Tetrachloro-m-Xylene	80	50-150	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8081A
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp B MET	**13-07-0378-2-D**	**07/06/13 14:30**	**Sea Water**	**GC 44**	**07/08/13**	**07/10/13 13:40**	**130708L12**

Parameter	Result	RL	DF	Qualifiers
Oxychlordane	ND	0.010	1	
Aldrin	ND	0.010	1	
Alpha Chlordane	ND	0.010	1	
Alpha-BHC	ND	0.010	1	
Beta-BHC	ND	0.010	1	
Chlordane	ND	0.025	1	
Cis-nonachlor	ND	0.010	1	
2,4'-DDD	ND	0.010	1	
4,4'-DDD	ND	0.010	1	
4,4'-DDE	ND	0.010	1	
2,4'-DDE	ND	0.010	1	
2,4'-DDT	ND	0.010	1	
4,4'-DDT	ND	0.010	1	
Delta-BHC	ND	0.010	1	
Dieldrin	ND	0.010	1	
Endosulfan I	ND	0.010	1	
Endosulfan II	ND	0.010	1	
Endosulfan Sulfate	ND	0.010	1	
Endrin	ND	0.010	1	
Endrin Aldehyde	ND	0.010	1	
Endrin Ketone	ND	0.010	1	
Gamma Chlordane	ND	0.010	1	
Gamma-BHC	ND	0.010	1	
Heptachlor	ND	0.010	1	
Heptachlor Epoxide	ND	0.010	1	
Methoxychlor	ND	0.010	1	
Mirex	ND	0.010	1	
Toxaphene	ND	0.12	1	
Trans-nonachlor	ND	0.010	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	86	50-150	
2,4,5,6-Tetrachloro-m-Xylene	81	50-150	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8081A
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-435-93**	**N/A**	**Aqueous**	**GC 44**	**07/08/13**	**07/10/13 12:57**	**130708L12**

Parameter	Result	RL	DF	Qualifiers
Oxychlordane	ND	0.010	1	
Aldrin	ND	0.010	1	
Alpha Chlordane	ND	0.010	1	
Alpha-BHC	ND	0.010	1	
Beta-BHC	ND	0.010	1	
Chlordane	ND	0.025	1	
Cis-nonachlor	ND	0.010	1	
2,4'-DDD	ND	0.010	1	
4,4'-DDD	ND	0.010	1	
4,4'-DDE	ND	0.010	1	
2,4'-DDE	ND	0.010	1	
2,4'-DDT	ND	0.010	1	
4,4'-DDT	ND	0.010	1	
Delta-BHC	ND	0.010	1	
Dieldrin	ND	0.010	1	
Endosulfan I	ND	0.010	1	
Endosulfan II	ND	0.010	1	
Endosulfan Sulfate	ND	0.010	1	
Endrin	ND	0.010	1	
Endrin Aldehyde	ND	0.010	1	
Endrin Ketone	ND	0.010	1	
Gamma Chlordane	ND	0.010	1	
Gamma-BHC	ND	0.010	1	
Heptachlor	ND	0.010	1	
Heptachlor Epoxide	ND	0.010	1	
Methoxychlor	ND	0.010	1	
Mirex	ND	0.010	1	
Toxaphene	ND	0.12	1	
Trans-nonachlor	ND	0.010	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	75	50-150	
2,4,5,6-Tetrachloro-m-Xylene	83	50-150	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PAHs
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-A**	**07/06/13 14:00**	**Sea Water**	**GC/MS AAA**	**07/08/13**	**07/17/13 16:13**	**130708L10**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	0.20	1	
2-Methylnaphthalene	ND	0.20	1	
1-Methylnaphthalene	ND	0.20	1	
Acenaphthylene	ND	0.20	1	
Acenaphthene	0.70	0.20	1	
Fluorene	ND	0.20	1	
Phenanthrene	ND	0.20	1	
Anthracene	ND	0.20	1	
Fluoranthene	0.54	0.20	1	
Pyrene	0.41	0.20	1	
Benzo (a) Anthracene	ND	0.20	1	
Chrysene	ND	0.20	1	
Benzo (k) Fluoranthene	ND	0.20	1	
Benzo (b) Fluoranthene	ND	0.20	1	
Benzo (a) Pyrene	ND	0.20	1	
Indeno (1,2,3-c,d) Pyrene	ND	0.20	1	
Dibenz (a,h) Anthracene	ND	0.20	1	
Benzo (g,h,i) Perylene	ND	0.20	1	
Benzo (e) Pyrene	ND	0.20	1	
Perylene	ND	0.20	1	
Biphenyl	ND	0.20	1	
1-Methylphenanthrene	ND	0.20	1	
2,6-Dimethylnaphthalene	ND	0.20	1	
1,6,7-Trimethylnaphthalene	ND	0.20	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	84	28-139	
2-Fluorobiphenyl	78	33-144	
p-Terphenyl-d14	99	23-160	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PAHs
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp B MET	**13-07-0378-2-A**	**07/06/13 14:30**	**Sea Water**	**GC/MS AAA**	**07/08/13**	**07/17/13 16:39**	**130708L10**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	0.20	1	
2-Methylnaphthalene	ND	0.20	1	
1-Methylnaphthalene	ND	0.20	1	
Acenaphthylene	ND	0.20	1	
Acenaphthene	ND	0.20	1	
Fluorene	ND	0.20	1	
Phenanthrene	ND	0.20	1	
Anthracene	ND	0.20	1	
Fluoranthene	ND	0.20	1	
Pyrene	ND	0.20	1	
Benzo (a) Anthracene	ND	0.20	1	
Chrysene	ND	0.20	1	
Benzo (k) Fluoranthene	ND	0.20	1	
Benzo (b) Fluoranthene	ND	0.20	1	
Benzo (a) Pyrene	ND	0.20	1	
Indeno (1,2,3-c,d) Pyrene	ND	0.20	1	
Dibenz (a,h) Anthracene	ND	0.20	1	
Benzo (g,h,i) Perylene	ND	0.20	1	
Benzo (e) Pyrene	ND	0.20	1	
Perylene	ND	0.20	1	
Biphenyl	ND	0.20	1	
1-Methylphenanthrene	ND	0.20	1	
2,6-Dimethylnaphthalene	ND	0.20	1	
1,6,7-Trimethylnaphthalene	ND	0.20	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	80	28-139	
2-Fluorobiphenyl	75	33-144	
p-Terphenyl-d14	98	23-160	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PAHs
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-280-43**	**N/A**	**Aqueous**	**GC/MS AAA**	**07/08/13**	**07/17/13 15:46**	**130708L10**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	0.20	1	
2-Methylnaphthalene	ND	0.20	1	
1-Methylnaphthalene	ND	0.20	1	
Acenaphthylene	ND	0.20	1	
Acenaphthene	ND	0.20	1	
Fluorene	ND	0.20	1	
Phenanthrene	ND	0.20	1	
Anthracene	ND	0.20	1	
Fluoranthene	ND	0.20	1	
Pyrene	ND	0.20	1	
Benzo (a) Anthracene	ND	0.20	1	
Chrysene	ND	0.20	1	
Benzo (k) Fluoranthene	ND	0.20	1	
Benzo (b) Fluoranthene	ND	0.20	1	
Benzo (a) Pyrene	ND	0.20	1	
Indeno (1,2,3-c,d) Pyrene	ND	0.20	1	
Dibenz (a,h) Anthracene	ND	0.20	1	
Benzo (g,h,i) Perylene	ND	0.20	1	
Benzo (e) Pyrene	ND	0.20	1	
Perylene	ND	0.20	1	
Biphenyl	ND	0.20	1	
1-Methylphenanthrene	ND	0.20	1	
2,6-Dimethylnaphthalene	ND	0.20	1	
1,6,7-Trimethylnaphthalene	ND	0.20	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	102	28-139	
2-Fluorobiphenyl	107	33-144	
p-Terphenyl-d14	124	23-160	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-B**	**07/06/13 14:00**	**Sea Water**	**GC/MS HHH**	**07/08/13**	**07/16/13 20:04**	**130708L03**

Parameter	Result	RL	DF	Qualifiers
PCB018	ND	0.020	1	
PCB028	ND	0.020	1	
PCB037	ND	0.020	1	
PCB044	ND	0.020	1	
PCB049	ND	0.020	1	
PCB052	ND	0.020	1	
PCB066	ND	0.020	1	
PCB070	ND	0.020	1	
PCB074	ND	0.020	1	
PCB077	ND	0.020	1	
PCB081	ND	0.020	1	
PCB087	ND	0.020	1	
PCB099	ND	0.020	1	
PCB101	ND	0.020	1	
PCB105	ND	0.020	1	
PCB110	ND	0.020	1	
PCB114	ND	0.020	1	
PCB118	ND	0.020	1	
PCB119	ND	0.020	1	
PCB123	ND	0.020	1	
PCB126	ND	0.020	1	
PCB128	ND	0.020	1	
PCB138/158	ND	0.040	1	
PCB149	ND	0.020	1	
PCB151	ND	0.020	1	
PCB153	ND	0.020	1	
PCB156	ND	0.020	1	
PCB157	ND	0.020	1	
PCB167	ND	0.020	1	
PCB168	ND	0.020	1	
PCB169	ND	0.020	1	
PCB170	ND	0.020	1	
PCB177	ND	0.020	1	
PCB180	ND	0.020	1	
PCB183	ND	0.020	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure	Date Received:	07/08/13
9210 Sky Park Court, Suite 200	Work Order:	13-07-0378
San Diego, CA 92123-4302	Preparation:	EPA 3510C
	Method:	EPA 8270C SIM PCB Congeners
	Units:	ug/L

Project: POLA-B163-164 Terminal (Elutriate)

Parameter	Result	RL	DF	Qualifiers
PCB187	ND	0.020	1	
PCB189	ND	0.020	1	
PCB194	ND	0.020	1	
PCB201	ND	0.020	1	
PCB206	ND	0.020	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
p-Terphenyl-d14	64	50-150	
2-Fluorobiphenyl	54	50-150	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 3 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp B MET	**13-07-0378-2-B**	**07/06/13 14:30**	**Sea Water**	**GC/MS HHH**	**07/08/13**	**07/16/13 20:33**	**130708L03**

Parameter	Result	RL	DF	Qualifiers
PCB018	ND	0.020	1	
PCB028	ND	0.020	1	
PCB037	ND	0.020	1	
PCB044	ND	0.020	1	
PCB049	ND	0.020	1	
PCB052	ND	0.020	1	
PCB066	ND	0.020	1	
PCB070	ND	0.020	1	
PCB074	ND	0.020	1	
PCB077	ND	0.020	1	
PCB081	ND	0.020	1	
PCB087	ND	0.020	1	
PCB099	ND	0.020	1	
PCB101	ND	0.020	1	
PCB105	ND	0.020	1	
PCB110	ND	0.020	1	
PCB114	ND	0.020	1	
PCB118	ND	0.020	1	
PCB119	ND	0.020	1	
PCB123	ND	0.020	1	
PCB126	ND	0.020	1	
PCB128	ND	0.020	1	
PCB138/158	ND	0.040	1	
PCB149	ND	0.020	1	
PCB151	ND	0.020	1	
PCB153	ND	0.020	1	
PCB156	ND	0.020	1	
PCB157	ND	0.020	1	
PCB167	ND	0.020	1	
PCB168	ND	0.020	1	
PCB169	ND	0.020	1	
PCB170	ND	0.020	1	
PCB177	ND	0.020	1	
PCB180	ND	0.020	1	
PCB183	ND	0.020	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 4 of 6

Parameter	Result	RL	DF	Qualifiers
PCB187	ND	0.020	1	
PCB189	ND	0.020	1	
PCB194	ND	0.020	1	
PCB201	ND	0.020	1	
PCB206	ND	0.020	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
p-Terphenyl-d14	72	50-150	
2-Fluorobiphenyl	61	50-150	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 5 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-433-55**	**N/A**	**Aqueous**	**GC/MS HHH**	**07/08/13**	**07/15/13 15:53**	**130708L03**

Parameter	Result	RL	DF	Qualifiers
PCB018	ND	0.020	1	
PCB028	ND	0.020	1	
PCB037	ND	0.020	1	
PCB044	ND	0.020	1	
PCB049	ND	0.020	1	
PCB052	ND	0.020	1	
PCB066	ND	0.020	1	
PCB070	ND	0.020	1	
PCB074	ND	0.020	1	
PCB077	ND	0.020	1	
PCB081	ND	0.020	1	
PCB087	ND	0.020	1	
PCB099	ND	0.020	1	
PCB101	ND	0.020	1	
PCB105	ND	0.020	1	
PCB110	ND	0.020	1	
PCB114	ND	0.020	1	
PCB118	ND	0.020	1	
PCB119	ND	0.020	1	
PCB123	ND	0.020	1	
PCB126	ND	0.020	1	
PCB128	ND	0.020	1	
PCB138/158	ND	0.040	1	
PCB149	ND	0.020	1	
PCB151	ND	0.020	1	
PCB153	ND	0.020	1	
PCB156	ND	0.020	1	
PCB157	ND	0.020	1	
PCB167	ND	0.020	1	
PCB168	ND	0.020	1	
PCB169	ND	0.020	1	
PCB170	ND	0.020	1	
PCB177	ND	0.020	1	
PCB180	ND	0.020	1	
PCB183	ND	0.020	1	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure	Date Received:	07/08/13
9210 Sky Park Court, Suite 200	Work Order:	13-07-0378
San Diego, CA 92123-4302	Preparation:	EPA 3510C
	Method:	EPA 8270C SIM PCB Congeners
	Units:	ug/L

Project: POLA-B163-164 Terminal (Elutriate)

Parameter	Result	RL	DF	Qualifiers
PCB187	ND	0.020	1	
PCB189	ND	0.020	1	
PCB194	ND	0.020	1	
PCB201	ND	0.020	1	
PCB206	ND	0.020	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
p-Terphenyl-d14	71	50-150	
2-Fluorobiphenyl	54	50-150	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience Environmental Laboratories, Inc.

Analytical Report

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	Organotins by Krone et al.
		Units:	ng/L
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B163-164 Comp A MET	**13-07-0378-1-E**	**07/06/13 14:00**	**Sea Water**	**GC/MS JJJ**	**07/09/13**	**07/10/13 13:15**	**130709L02**

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	ND	3.0	1	
Monobutyltin	ND	3.0	1	
Tetrabutyltin	ND	3.0	1	
Tributyltin	ND	3.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	91	30-120	

B163-164 Comp B MET	**13-07-0378-2-E**	**07/06/13 14:30**	**Sea Water**	**GC/MS JJJ**	**07/09/13**	**07/10/13 13:45**	**130709L02**

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	ND	3.0	1	
Monobutyltin	ND	3.0	1	
Tetrabutyltin	ND	3.0	1	
Tributyltin	ND	3.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	90	30-120	

Method Blank	**099-07-035-235**	**N/A**	**Aqueous**	**GC/MS JJJ**	**07/09/13**	**07/10/13 12:15**	**130709L02**

Parameter	Result	RL	DF	Qualifiers
Dibutyltin	ND	3.0	1	
Monobutyltin	ND	3.0	1	
Tetrabutyltin	ND	3.0	1	
Tributyltin	ND	3.0	1	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tripentyltin	91	30-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3005A Total
		Method:	EPA 1640
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 2

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-07-0353-1	**Sea Water**	**ICP/MS 05**	**07/11/13**	**07/11/13 19:59**	**130711S02**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Arsenic	1.536	0.5000	2.098	112	2.077	108	50-150	1	0-20	
Cadmium	0.07905	0.5000	0.6463	113	0.6263	109	50-150	3	0-20	
Chromium	0.5353	5.000	6.646	122	6.773	125	50-150	2	0-20	
Copper	3.658	0.5000	4.113	4X	3.939	4X	50-150	4X	0-20	Q
Lead	0.3480	0.5000	0.8660	104	0.8267	96	50-150	5	0-20	
Nickel	0.6663	0.5000	1.240	115	1.179	103	50-150	5	0-20	
Selenium	ND	0.5000	0.5986	120	0.6404	128	50-150	7	0-20	
Silver	ND	0.2500	0.06635	27	0.07913	32	50-150	18	0-20	3
Zinc	8.721	5.000	13.02	86	12.77	81	50-150	2	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 7470A Total
		Method:	EPA 7470A
Project: POLA-B163-164 Terminal (Elutriate)			Page 2 of 2

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-07-0603-5	**Sea Water**	**Mercury**	**07/15/13**	**07/16/13 12:10**	**130715S04**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	10.00	9.139	91	9.592	96	66-126	5	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Sample Duplicate

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 2540 D
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 1

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
B163-164 Comp A MET	**Sea Water**	**N/A**	**07/09/13 00:00**	**07/09/13 20:10**	**D0709TSSD2**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Solids, Total Suspended	53.50	54.25	1	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	N/A
		Method:	SM 2540 D
Project: POLA-B163-164 Terminal (Elutriate)			Page 1 of 8

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-09-010-6346	**Aqueous**	**N/A**	**07/09/13**	**07/09/13 20:10**	**D0709TSSL2**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Solids, Total Suspended	100.0	95.00	95	96.00	96	80-120	1	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270D (M)/TQ/EI
Project: POLA-B163-164 Terminal (Elutriate)			Page 2 of 8

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-553-9	**Aqueous**	**GCTQ 1**	**07/09/13**	**07/09/13 21:42**	**130709L01**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Allethrin	0.1000	0.09619	96	0.1044	104	25-200	0-229	8	0-25	
Bifenthrin	0.1000	0.09081	91	0.09329	93	25-200	0-229	3	0-25	
Cyfluthrin	0.1000	0.09295	93	0.1027	103	25-200	0-229	10	0-25	
Cypermethrin	0.1000	0.09665	97	0.1130	113	25-200	0-229	16	0-25	
Deltamethrin/Tralomethrin	0.1000	0.1187	119	0.1322	132	25-200	0-229	11	0-25	
Fenpropathrin	0.1000	0.1157	116	0.1219	122	25-200	0-229	5	0-25	
Fenvalerate/Esfenvalerate	0.2000	0.1954	98	0.2194	110	25-200	0-229	12	0-25	
Fluvalinate	0.1000	0.05862	59	0.06538	65	25-200	0-229	11	0-25	
Permethrin (cis/trans)	0.1000	0.09101	91	0.09800	98	25-200	0-229	7	0-25	
Phenothrin	0.1000	0.08778	88	0.09262	93	25-200	0-229	5	0-25	
Resmethrin/Bioresmethrin	0.1000	0.1000	100	0.1029	103	25-200	0-229	3	0-25	
Tetramethrin	0.1000	0.1129	113	0.1176	118	25-200	0-229	4	0-25	
lambda-Cyhalothrin	0.1000	0.09785	98	0.1154	115	25-200	0-229	16	0-25	

Total number of LCS compounds: 13
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3005A Filt.
		Method:	EPA 1640
Project: POLA-B163-164 Terminal (Elutriate)			Page 3 of 8

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-13-067-340	**Aqueous**	**ICP/MS 05**	**07/11/13 19:06**	**130711L02F**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Arsenic	0.5000	0.5220	104	70-130	
Cadmium	0.5000	0.5021	100	70-130	
Chromium	5.000	5.088	102	70-130	
Copper	0.5000	0.6105	122	70-130	
Lead	0.5000	0.5222	104	70-130	
Nickel	0.5000	0.5192	104	70-130	
Selenium	0.5000	0.4946	99	70-130	
Silver	0.2500	0.2604	104	70-130	
Zinc	5.000	5.029	101	70-130	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 7470A Filt.
		Method:	EPA 7470A
Project: POLA-B163-164 Terminal (Elutriate)			Page 4 of 8

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-12-510-368	**Aqueous**	**Mercury**	**07/15/13 17:33**	**130715L04A**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	10.00	10.58	106	85-121	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8081A
Project: POLA-B163-164 Terminal (Elutriate)			Page 5 of 8

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-435-93	**Aqueous**	**GC 44**	**07/08/13**	**07/10/13 13:55**	**130708L12**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Aldrin	0.2500	0.1849	74	0.1864	75	50-150	33-167	1	0-25	
Alpha Chlordane	0.2500	0.1847	74	0.1887	75	50-150	33-167	2	0-25	
Alpha-BHC	0.2500	0.1951	78	0.1999	80	50-150	33-167	2	0-25	
Beta-BHC	0.2500	0.1974	79	0.1941	78	50-150	33-167	2	0-25	
4,4'-DDD	0.2500	0.1975	79	0.2012	80	50-150	33-167	2	0-25	
4,4'-DDE	0.2500	0.1944	78	0.1990	80	50-150	33-167	2	0-25	
4,4'-DDT	0.2500	0.1841	74	0.1865	75	50-150	33-167	1	0-25	
Delta-BHC	0.2500	0.1831	73	0.1858	74	50-150	33-167	1	0-25	
Dieldrin	0.2500	0.1846	74	0.1879	75	50-150	33-167	2	0-25	
Endosulfan I	0.2500	0.1913	77	0.1951	78	50-150	33-167	2	0-25	
Endosulfan II	0.2500	0.1903	76	0.1926	77	50-150	33-167	1	0-25	
Endosulfan Sulfate	0.2500	0.1829	73	0.1875	75	50-150	33-167	2	0-25	
Endrin	0.2500	0.1956	78	0.2006	80	50-150	33-167	3	0-25	
Endrin Aldehyde	0.2500	0.1707	68	0.1695	68	50-150	33-167	1	0-25	
Gamma Chlordane	0.2500	0.1756	70	0.1782	71	50-150	33-167	1	0-25	
Gamma-BHC	0.2500	0.1871	75	0.1922	77	50-150	33-167	3	0-25	
Heptachlor	0.2500	0.1906	76	0.1933	77	50-150	33-167	1	0-25	
Heptachlor Epoxide	0.2500	0.1879	75	0.1915	77	50-150	33-167	2	0-25	
Methoxychlor	0.2500	0.1793	72	0.1836	73	50-150	33-167	2	0-25	

Total number of LCS compounds: 19
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PAHs
Project: POLA-B163-164 Terminal (Elutriate)			Page 6 of 8

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-280-43	**Aqueous**	**GC/MS AAA**	**07/08/13**	**07/16/13 16:14**	**130708L10**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Naphthalene	2.000	1.257	63	1.274	64	21-133	2-152	1	0-25	
2-Methylnaphthalene	2.000	1.473	74	1.346	67	21-140	1-160	9	0-25	
1-Methylnaphthalene	2.000	1.449	72	1.319	66	20-140	0-160	9	0-25	
Acenaphthylene	2.000	1.335	67	1.264	63	33-145	14-164	5	0-25	
Acenaphthene	2.000	1.408	70	1.356	68	55-121	44-132	4	0-25	
Fluorene	2.000	1.594	80	1.549	77	59-121	49-131	3	0-25	
Phenanthrene	2.000	1.400	70	1.389	69	54-120	43-131	1	0-25	
Anthracene	2.000	0.4762	24	0.5348	27	27-133	9-151	12	0-25	ME
Fluoranthene	2.000	1.440	72	1.479	74	26-137	8-156	3	0-25	
Pyrene	2.000	1.453	73	1.461	73	45-129	31-143	1	0-25	
Benzo (a) Anthracene	2.000	1.324	66	1.319	66	33-143	15-161	0	0-25	
Chrysene	2.000	1.466	73	1.474	74	17-168	0-193	1	0-25	
Benzo (k) Fluoranthene	2.000	2.091	105	2.214	111	24-159	2-182	6	0-25	
Benzo (b) Fluoranthene	2.000	2.288	114	2.319	116	24-159	2-182	1	0-25	
Benzo (a) Pyrene	2.000	0.9122	46	0.9176	46	17-163	0-187	1	0-25	
Indeno (1,2,3-c,d) Pyrene	2.000	2.583	129	2.567	128	25-175	0-200	1	0-25	
Dibenz (a,h) Anthracene	2.000	1.981	99	1.985	99	25-175	0-200	0	0-25	
Benzo (g,h,i) Perylene	2.000	1.798	90	1.762	88	25-157	3-179	2	0-25	

Total number of LCS compounds: 18
Total number of ME compounds: 1
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	EPA 8270C SIM PCB Congeners
Project: POLA-B163-164 Terminal (Elutriate)			Page 7 of 8

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-433-55	**Aqueous**	**GC/MS HHH**	**07/08/13**	**07/15/13 12:57**	**130708L03**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
PCB018	1.000	0.6749	67	0.6368	64	50-150	33-167	6	0-25	
PCB028	1.000	0.7534	75	0.7023	70	50-150	33-167	7	0-25	
PCB044	1.000	0.7279	73	0.6658	67	50-150	33-167	9	0-25	
PCB052	1.000	0.6961	70	0.6435	64	50-150	33-167	8	0-25	
PCB066	1.000	0.7780	78	0.7119	71	50-150	33-167	9	0-25	
PCB077	1.000	0.8078	81	0.7229	72	50-150	33-167	11	0-25	
PCB101	1.000	0.7386	74	0.6755	68	50-150	33-167	9	0-25	
PCB105	1.000	0.7774	78	0.7065	71	50-150	33-167	10	0-25	
PCB118	1.000	0.8237	82	0.7581	76	50-150	33-167	8	0-25	
PCB126	1.000	0.7407	74	0.6654	67	50-150	33-167	11	0-25	
PCB128	1.000	0.7252	73	0.6544	65	50-150	33-167	10	0-25	
PCB153	1.000	0.7104	71	0.6513	65	50-150	33-167	9	0-25	
PCB170	1.000	0.6683	67	0.6040	60	50-150	33-167	10	0-25	
PCB180	1.000	0.7331	73	0.6749	67	50-150	33-167	8	0-25	
PCB187	1.000	0.7274	73	0.6479	65	50-150	33-167	12	0-25	
PCB206	1.000	0.5715	57	0.5212	52	50-150	33-167	9	0-25	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

AMEC Environment & Infrastructure		Date Received:	07/08/13
9210 Sky Park Court, Suite 200		Work Order:	13-07-0378
San Diego, CA 92123-4302		Preparation:	EPA 3510C
		Method:	Organotins by Krone et al.
Project: POLA-B163-164 Terminal (Elutriate)			Page 8 of 8

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-07-035-235	**Aqueous**	**GC/MS JJJ**	**07/09/13**	**07/10/13 11:14**	**130709L02**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	200.0	176.4	88	178.6	89	56-140	1	0-20	
Tributyltin	200.0	208.3	104	211.0	106	52-112	1	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order: 13-07-0378

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

For any analysis identified as a "field" test with a holding time (HT) </= 15 minutes where the sample is received outside of HT, Calscience will adhere to its internal HT of 24 hours. In cases where sample analysis does not meet Calscience's internal HT, results will be appropriately qualified.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 · FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE: 7/8/13

PAGE: 1 OF 1

LABORATORY CLIENT: AMEC Earth & Environmental

ADDRESS: 9210 Sky Park Court, Suite 200

CITY: San Diego, CA 92123

TEL: 858-300-4320

E-MAIL: Barry.Synder@amec.com

CLIENT PROJECT NAME / NUMBER: POLA -B163-164 Terminal (Elutriate)

PROJECT CONTACT: Barry Snyder/Tyler Huff

SAMPLER(S): (SIGNATURE)

P.O. NO.:

Temp Blank.:

LAB USE ONLY: 13-07-0378

TURNAROUND TIME

___ SAME DAY ___24 HR ___48HR ___72 HR _X_STANDARD

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

☐ ARCHIVE SAMPLES UNTIL ____ / ____ / ____

SPECIAL INSTRUCTIONS:

On-shore and Off-shore Sitewater received 6/25/13 (CEL WO# 13-06-1678)

Comp A (on-shore) and Comp B (off-shore) Sediment received 7/3/13 (CEL WO# 13-07-0299)

*As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Zn

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	EPA 1640/7470A Metals*	EPA 8270C SIM PAHS	EPA 8270C SIM PCB CONGENERS	EPA 8081A OC PESTICIDES	ORGANOTINS by Krone et al.	PYRETHROIDS by GC/TQ	TSS by SM 2540	COMMENTS
1	B163-164 Comp A MET	Onshore	7/6/13	14:00	SW	9	X	X	X	X	X	X	X	
2	B163-164 Comp B MET	Offshore	↓	14:30	SW	9	X	X	X	X	X	X	X	
3	Elutriate Blank		↓	15:00	SW	4								HOLD

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Bannyle	Pleay 1 - aa	7/8/13	11:23
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-07-0378

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: AMEC Earth & Env'l

DATE: 07 / 8 / 13

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.6 °C - 0.2 °C (CF) = 2.4 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Initial:** b.c

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Initial:** b.c

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** b.c

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☐	☑	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☑1PB ☐1PB**na** ☑500PB

☑250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** b.c

Container: C: Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** DS

Preservative: h: HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** DS

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APPENDIX E

NAUTILUS ENVIRONMENTAL TOXICITY TESTING REPORT

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Nautilus Environmental

Results of Toxicity Testing for the Port of Los Angeles Berths 163-164 Dredged Material

❖ Sampling Period: June 2013

Prepared for: **AMEC Environment & Infrastructure, Inc.**

Prepared by: **Nautilus Environmental**

Submitted: **August 26, 2013**

Data Quality Assurance:

- Nautilus Environmental is a certified laboratory under the State of California Department of Health Services, Environmental Laboratory Accreditation Program (ELAP), Certificate No. 1802.
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective EPA protocols, unless otherwise noted in this report.
- Any test data discrepancies or protocol deviations have been noted in the report.

California
4340 Vandever Avenue
San Diego, California 92120
858.587.7333
fax: 858.587.3961

British Columbia
8664 Commerce Court
Burnaby, British Columbia
V5A 4N7
604-420-8773
fax: 604-603-9381

Results verified by: Adrienne Cibor

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1.0 INTRODUCTION

The Port of Los Angeles is proposing to dredge sediments adjacent to the Berths 163-164 and dispose of the material at the LA-2 ocean disposal site. Samples were collected in June 2013 by AMEC Environment & Infrastructure, Inc. (AMEC) and submitted to Nautilus Environmental (Nautilus) for bioassay testing to characterize the potential dredged materials to determine suitability for open ocean disposal. The sediment was characterized using the solid phase sediment test for marine amphipod survival as outlined in the 1991 USEPA/USACE "Greenbook" testing protocol; "*Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual"*.

This report presents the results of amphipod toxicity testing conducted on whole-sediment composite samples collected from two sites within the dredging footprint. In addition, reference sediment was collected and tested from the US Environmental Protection Agency (EPA) approved LA-2 Ocean Dredged Material Disposal Site. LA-2 sediment serves as a disposal-site reference location for comparison purposes. Based on the results of the amphipod survival test and chemical analyses, no further Greenbook toxicity tests were conducted for these samples.

2.0 METHODS

2.1 Study Design

The material under consideration for ocean disposal was tested according to the project-specific Sampling and Analysis Plan (SAP) (AMEC, 2013) using criteria outlined in the Ocean Testing Manual (USEPA/USACE 1991), and the Inland Testing Manual (USEPA/USACE 1998).

The solid phase amphipod tests included two concurrent controls, consisting of coarse sand collected in the same location as the organisms (home sediment), and a fine-grained control sediment collected from an area in Sail Bay in Mission Bay, San Diego that is relatively free of potentially toxic concentrations of contaminants. Grain size is a well known potential confounding factor for amphipods, needing careful consideration and control to avoid falsely concluding a toxic effect when actual effects may be related to grain size (ASTM 1999, USEPA 1994, and Nautilus internal data). The lab control sediment from the amphipod collection site is composed of nearly 100% sand, lacking silt and clay fractions. Thus, the additional "fine grain size" control sediment was tested to better represent the common fine sediments found within bays and harbors. Reference sediment was collected from the LA-2 ocean disposal site on June 2, 2013.

2.2 Sample Collection, Receipt, and Preparation

All site sediments from Berths 163-164 were collected on between June 3 and June 8, 2013. Approximately 25 gallons of sediment were collected for toxicity testing from each site. The sediment was collected in food-grade polyethylene plastic liners and was then transported by courier in coolers containing wet ice to the Nautilus laboratory in San Diego, CA. Core samples were received at Nautilus between June 4 and June 8, 2013 and were stored at 4°C until being composited and homogenized by AMEC staff on June 10, 2013. Samples were identified as B163-164 A Comp, B163-164 B Comp, and LA-2 Reference. Chain of custody documentation for all samples is provided in Appendix E. Sub-samples were removed from each composite sample for chemical analysis, and then composited sediments were stored at 4°C until used for toxicity testing. Just prior to testing, the composite samples were again thoroughly homogenized and sieved through a 500-µm Nitex® mesh screen to remove native organisms and large debris that may interfere with the survival and recovery of test organisms.

Table 1. Sediment Sample IDs

Site ID	Composite Date	Receipt Date
B163-164 A Comp	June 10, 2013	June 11, 2013[a]
B163-164 B Comp	June 10, 2013	June 11, 2013[a]
LA-2 Reference	June 2, 2013	June 4, 2013

[a] Samples were stored at Nautilus in 4°C overnight after compositing on June 10 and were released to Nautilus staff the following morning of June 11.

2.3 Toxicity Test Methodology

Test methods and acceptability criteria are described in Table 2. Water quality parameters (pH, temperature, salinity and dissolved oxygen) were monitored in surrogate test chambers on a daily basis. Sub-samples from test chambers were also collected to monitor ammonia concentrations; porewater samples were collected and tested for ammonia before initiation, and from the overlying water at test initiation and termination.

Table 2. Toxicity Test Methodology and QA/QC Requirements for Solid Phase Toxicity Tests Using the Marine Amphipod, *Eohaustorius estuarius*

Test organism	Marine Amphipod – *Eohaustorius estuarius*
Test organism source	Northwest Aquatic Sciences; Newport, Oregon
Test organism size class	3-5 mm
Test duration; endpoint	10 days; survival
Test solution renewal	None
Feeding	None
Test chamber	1-L glass jar
Sediment depth	2 cm
Overlying water volume	800 mL
Test temperature	15 ± 1°C test-wide mean, 15 ± 3°C daily instantaneous
Dilution water	Natural seawater collected offshore of the Scripps Pier in La Jolla, CA. Seawater is diluted to 30 ppt with deionized water prior to testing.
Test concentrations	Undiluted sediment
Number of organisms/chamber	20
Number of replicates	5, plus 1 surrogate test chamber for water quality readings
Negative controls	Home sediment from amphipod collection site and fine-grain control from Sail Bay
Photoperiod	Continuous light (24 hr)
Aeration	Continuous (1-2 bubbles per second)
Test Protocol	USEPA/USACE 1991,1998; US EPA 1994
Test acceptability criteria	≥ 90 percent mean survival in controls
Reference toxicant	Cadmium chloride

2.4 Statistical Analyses

Survival data from solid-phase tests were arcsine square-root transformed and analyzed using unpaired, one-tailed t-tests comparing survival in each test sediment against survival in the

reference sediment. Prior to analyses, normality was evaluated with D'Agostino & Pearson Omnibus test, and homogeneity of variance was assessed with an f-test. Solid-phase analyses were performed with GraphPad Prism, Version 4.02. Reference toxicant test data was evaluated statistically using the Comprehensive Environmental Toxicity Information System™ (CETIS) software by Tidepool Scientific.

3.0 RESULTS

A summary of the toxicity test results are provided in Table 3 and Figure 1. Detailed results, including statistical analyses, are provided in Appendix A. Water quality data are provided in Appendix B. Chain of custody information is available in Appendix C.

Mean survival in the lab control was 97 percent, which met the minimum test acceptability criterion of 90 percent. Survival in the fine grain size control and the LA-2 Reference site was 95 and 98 percent, respectively. *Eohaustorius* survival was significantly decreased in both the B163-164 A Comp (46% survival) and B163-164 B Comp (45% survival) samples, relative to that in the LA-2 Reference material, and the fine grain size control.

Table 3. Summary of Solid-Phase Toxicity Test Results

Site	Mean Percent Survival	Standard Deviation
Lab Control	97	4.5
Fine Grain Size Control	95	6.1
LA-2 Reference	98	2.7
B163-164 A Comp	**46***	12
B163-164 B Comp	**45***	16

***Bold asterisk** values are significantly reduced from the mean survival in the LA-2 reference sediment.

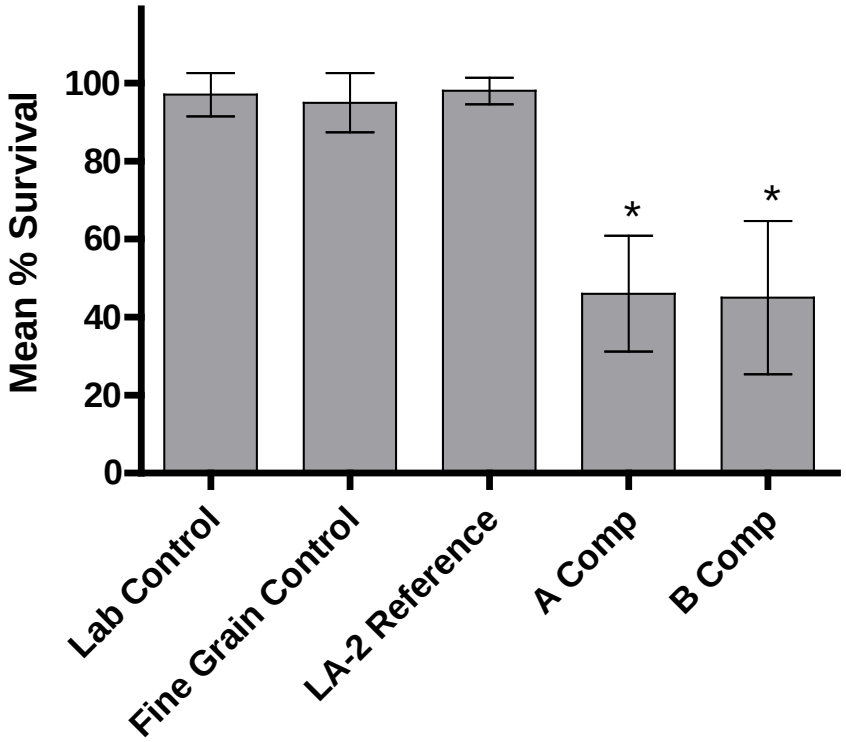

Figure 1. Survival of amphipods (*Eohaustorius estuarius*) in the 10-day solid-phase toxicity test for sediment from Berths 163-164 (mean percent survival ± 95% CI). Columns marked with an asterisk differ significantly from the LA-2 Reference sample ($p < 0.05$).

4.0 QUALITY ASSURANCE / QUALITY CONTROL

All of the data presented have been thoroughly reviewed and are deemed acceptable for reporting in accordance with our internal QA/QC program and relevant protocols. The toxicity tests were initiated within sediment holding time requirements.

4.1 Reference Toxicant Test

The *Eohaustorius* 96-hour reference toxicant test met all minimum test acceptability criteria. Additionally, the median lethal effect (LC_{50}) concentration value was within ± two standard deviations of internal control chart mean for this species, indicating that the organisms used for testing exhibited typical sensitivity to cadmium. Reference toxicant test results for the solid-phase test are provided in Appendix D.

4.2 Potential Confounding Factors

The influence of several potential confounding factors on test performance and interpretation were assessed and are discussed below.

4.2.1 Ammonia

Total and un-ionized ammonia concentrations are summarized in Table 4. Total and un-ionized ammonia concentrations in these sediments and overlying water were at least an order of magnitude below published toxic thresholds for this species (Table 4). Thus, the toxicity observed in B163-164 A Comp and B163-164 B Comp amphipod tests appears to be unrelated to ammonia concentrations.

Table 4. Total and Un-ionized Ammonia Concentrations in Porewater and Overlying Water of the Solid-Phase Toxicity Test

	Total Ammonia (mg/L)		Un-ionized Ammonia (mg/L)	
	Day 0	Day 10	Day 0	Day 10
Porewater				
Lab Control	<0.5	--	<0.005	--
Fine Grain Size Control	2.6	--	0.033	--
LA-2 Reference	4.1	--	0.048	--
B163-164 A Comp	18	--	0.646	--
B163-164 B Comp	23	--	0.584	--
Overlying water				
Lab Control	<0.5	<0.5	<0.015	<0.010
Fine Grain Size Control	<0.5	<0.5	<0.014	<0.016
LA-2 Reference	<0.5	1.5	<0.016	0.040
B163-164 A Comp	2.3	5.9	0.085	0.131
B163-164 B Comp	3.3	7.9	0.124	0.232

***Eohaustorius* Ammonia Threshold Effect Levels**	
Total Ammonia (mg/L)	Un-ionized Ammonia (mg/L)
60[a] – 93[b]	0.8[a] – 1.2[b]

-- Not measured
[a] NOEC values from EPA 1994 & Kohn et al 1994
[b] 96-h LC_{50} values from Nautilus internal data, March 2013

5.0 REFERENCES

AMEC (2013). Final Sampling and Analysis Plan Berths 163-164 Maintenance Dredging Project, Los Angeles Harbor. May 1, 2013.

ASTM (1999). Standard Guide for Conducting 10-day Static Sediment Toxicity Tests with Marine and Estuarine Amphipods. American Society for Testing and Materials, ASTM Designation E1367-99.

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EPA/USACE (1998). Evaluation of Dredged Material Proposed for Discharge in Water of the U.S. Inland Testing Manual. February 1998. Environmental Protection Agency, Office of Water & United States Army Corps of Engineers, Department of The Army. EPA 823/B-98/004.

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Kohn NP, Word JQ and Niyogi DK (1994). Acute toxicity of ammonia to four species of marine amphipod. *Marine Environmental Research*. 38; 1-15.

Tidepool Scientific Software. 2000-2012. CETIS© Comprehensive Environmental Toxicity Information System Software, Version 1.8.4.23.

Appendix A
Summary of Toxicity Test Results

Appendix Table A-1. *Eohaustorius estuarius* 10-day Survival

Sediment Characterization for Berths 163-164

Test initiation: June 14, 2013

Site	Replicate	# Alive	% Survival	Mean % Survival	SD
Laboratory Control (home sediment)	A	20	100	97	4.5
	B	20	100		
	C	19	95		
	D	18	90		
	E	20	100		
Fine Grain Size Control	A	17	85	95	6.1
	B	19	95		
	C	20	100		
	D	20	100		
	E	19	95		
LA-2 Reference Site	A	20	100	98	2.7
	B	20	100		
	C	19	95		
	D	19	95		
	E	20	100		
B163-164 A Comp	A	13	65	**46***	12
	B	8	40		
	C	8	40		
	D	10	50		
	E	7	35		
B163-164 B Comp	A	8	40	**45***	16
	B	12	60		
	C	10	50		
	D	11	55		
	E	4	20		

***Bold asterisk** values are significantly different from the LA-2 Reference sample.

SD = standard deviation

AMEC/POLA
10-Day *Eohaustorius* Survival Bioassay
Random Number Assignment
Project: Berths 163-164
Test Initiation Date: 6/14/13

Site	Rep	Rand #
Lab Control (Eoh home sediment)	A	16
	B	24
	C	8
	D	25
	E	4
Fine Grain Size Control	A	20
	B	21
	C	17
	D	15
	E	3
LA2 Reference	A	19
	B	1
	C	14
	D	10
	E	7
Berths 163-164 Composite A	A	35
	B	29
	C	30
	D	34
	E	32
Berths 163-164 Composite B	A	27
	B	26
	C	33
	D	31
	E	28

QC: BG

Final review: AK 8/20/13

Sediment Bioassay **Organism Survival**

Client: AMEC/POLA **Test Species:** *E. estuarius*

Project ID: Berths 163-164 **Start Date/Time:** 6/14/2013 1445

Initiated by: BG **End Date/Time:** 6/24/2013 1040

Initial No. Organisms: 20/rep **Test No. Series:** 1306-S074 to S079

Random Number	Number Alive	10% QC Check of final counts	Random Number	Number Alive	10% QC Check of final counts
1	20				
3	19				
4	20				
7	20				
8	19				
10	19				
14	19				
15	20				
16	20				
17	20				
19	20				
20	17	17			
21	19				
24	20				
25	18				
26	12				
27	8				
28	4	4			
29	8				
30	8				
31	11				
32	7				
33	10				
34	10				
35	13	13			
Tech Initials:	BG/PA	BK	Tech Initials:		

Initiation QC Check Initials:

Counts CU/MU/BG All Jars initiated BG Air BG Lights (24 Hour) BG

T_0 pore water WQ (pH, salinity, ammonia) BG All pore water ammonia <60 mg/L BG

Termination QC Check Initials:

T_f ~~pore~~ overlying water WQ (pH, salinity, ammonia) BG

Animal Source/Date Received: Northwestern Aquatic Sciences 6/7/13 **Age at Initiation:** 3-5mm

Comments: randomized with sharing control

QC Check: BG 7/2/13 **Final Review:** AC 8/20/13

Appendix Table A-2. Statistical Analysis of *Eohaustorius* 10-day Survival

Sediment Characterization for Berths 163-164

Test initiation: June 14, 2013

t-test Results				
Comparison			% Difference From Reference / Grain Size Control	p
LA-2 Reference	vs.	B163-164 A Comp	-52	**<0.0001***
LA-2 Reference	vs.	B163-164 B Comp	-53	**<0.0001***
Fine Grain Size Control	vs.	B163-164 A Comp	-49	**<0.0001***
Fine Grain Size Control	vs.	B163-164 B Comp	-50	**0.0001***

***Bold asterisk** indicates a statistically significant reduction in survival relative to the reference or fine grain size control sediment ($p<0.05$).

	Parameter	A Value Y
1	Table Analyzed	Transform of Transform of Eoh survival
2	Column C	LA2 REF
3	vs	vs
4	Column D	A Comp
5		
6	Unpaired t test	
7	P value	P<0.0001
8	P value summary	***
9	Are means signif. different? (P < 0.05)	Yes
10	One- or two-tailed P value?	One-tailed
11	t, df	t=9.430 df=8
12		
13	How big is the difference?	
14	Mean ± SEM of column C	1.200 ± 0.03278 N=5
15	Mean ± SEM of column D	0.6891 ± 0.04310 N=5
16	Difference between means	0.5106 ± 0.05415
17	95% confidence interval	0.3858 to 0.6355
18	R squared	0.9175
19		
20	F test to compare variances	
21	F,DFn, Dfd	1.729, 4, 4
22	P value	0.6090
23	P value summary	ns
24	Are variances significantly different?	No

entered: LC 8/26/13
QC: KPP 8/26/13

	Parameter	A Value Y
1	Table Analyzed	Transform of Transform of Eoh survival
2	Column C	LA2 REF
3	vs	vs
4	Column E	B Comp
5		
6	Unpaired t test	
7	P value	P<0.0001
8	P value summary	***
9	Are means signif. different? (P < 0.05)	Yes
10	One- or two-tailed P value?	One-tailed
11	t, df	t=7.406 df=8
12		
13	How big is the difference?	
14	Mean ± SEM of column C	1.200 ± 0.03278 N=5
15	Mean ± SEM of column E	0.6758 ± 0.06270 N=5
16	Difference between means	0.5240 ± 0.07075
17	95% confidence interval	0.3608 to 0.6871
18	R squared	0.8727
19		
20	F test to compare variances	
21	F,DFn, Dfd	3.658, 4, 4
22	P value	0.2370
23	P value summary	ns
24	Are variances significantly different?	No

Entered: AC 8/20/13
QC: KFP 8/26/13

	Parameter	A Value Y
1	Table Analyzed	Transform of Transform of Eoh survival
2	Column B	Fine Grain Control
3	vs	vs
4	Column D	A Comp
5		
6	Unpaired t test	
7	P value	P<0.0001
8	P value summary	***
9	Are means signif. different? (P < 0.05)	Yes
10	One- or two-tailed P value?	One-tailed
11	t, df	t=7.273 df=8
12		
13	How big is the difference?	
14	Mean ± SEM of column B	1.151 ± 0.04657 N=5
15	Mean ± SEM of column D	0.6891 ± 0.04310 N=5
16	Difference between means	0.4616 ± 0.06346
17	95% confidence interval	0.3152 to 0.6079
18	R squared	0.8686
19		
20	F test to compare variances	
21	F,DFn, Dfd	1.168, 4, 4
22	P value	0.8842
23	P value summary	ns
24	Are variances significantly different?	No

Entered AC 8/20/13
QC=KFP 8/26/13

	Parameter	A Value Y
1	Table Analyzed	Transform of Transform of Eoh survival
2	Column B	Fine Grain Control
3	vs	vs
4	Column E	B Comp
5		
6	Unpaired t test	
7	P value	0.0001
8	P value summary	***
9	Are means signif. different? (P < 0.05)	Yes
10	One- or two-tailed P value?	One-tailed
11	t, df	t=6.080 df=8
12		
13	How big is the difference?	
14	Mean ± SEM of column B	1.151 ± 0.04657 N=5
15	Mean ± SEM of column E	0.6758 ± 0.06270 N=5
16	Difference between means	0.4749 ± 0.07810
17	95% confidence interval	0.2948 to 0.6550
18	R squared	0.8221
19		
20	F test to compare variances	
21	F,DFn, Dfd	1.812, 4, 4
22	P value	0.5788
23	P value summary	ns
24	Are variances significantly different?	No

Entered 8/20/13 AC
QC: KFP 8/26/13

Appendix B

Water Quality Raw Data

10-Day Marine Sediment Bioassay
Static Conditions

Water Quality Measurements

Client: AMEC/POLA

Test Species: *E. estuarius*

Site ID: Lab Control

Start Date/Time: 6/14/2013 1445

Test No.: 1306-S074 to S079

End Date/Time: 6/24/2013 1040

Test Day	Salinity (ppt)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0	30.1	15.9	8.1	8.11	CL	
1	~~28.4~~ AD 29.6	15.3	8.5	7.96	AD	
2	30.3	15.3	8.4	8.07	SD	
3	29.9	15.2	7.7	7.98	LN	
4	30.1	14.6	8.7	cl ~~7.98~~ 8.01	CL	
5	30.0	14.9	8.7	7.97	CL	
6	30.1	14.8	8.6	7.98	BG	
7	~~29.4~~ ML 30.0	14.8	8.2	8.04	ML	
8	29.9 ML ~~29.8~~	14.7	8.5	8.08	ML	
9	cl ~~30.4~~ 30.0	14.8	8.2	8.05	CL	
10	30.1	14.7	8.7	7.99	BG	

QC Check: BG 7/2/13

Final Review: VS 8/8/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.

10-Day Marine Sediment Bioassay
Static Conditions

Water Quality Measurements

Client: AMEC/POLA

Test Species: *E. estuarius*

Site ID: Fine Grain Size Control

Start Date/Time: 6/14/2013 1445

Test No.: 1306-S074 to S079

End Date/Time: 6/24/2013 1040

Test Day	Salinity (ppt)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0	30.5	15.8	8.0	8.09	CL	
1	~~28.9~~ 30.2 AD	14.5	8.5	7.96	AD	
2	30.8	14.8	7.8	8.08	SD	
3	30.5	14.8	7.7	8.01	LN	
4	30.5	14.4	8.7	8.03	CL	
5	30.5	14.5	8.4	8.06	CL	
6	30.6	14.6	8.3	8.02	BG	
7	ML ~~30.0~~ ~~30.5~~ 30.5	14.5	8.1	8.10	ML	
8	30.4	14.6	8.2	8.16	ML	
9	30.6	14.5	8.1	8.21	CL	
10	30.6	14.4	8.5	8.18	BG	

QC Check: BG 7/2/13

Final Review: YS 8/8/13

10-Day Marine Sediment Bioassay
Static Conditions

Water Quality Measurements

Client: AMEC/POLA

Test Species: *E. estuarius*

Site ID: LA2 Reference

Start Date/Time: 6/14/2013 1445

Test No.: 1306-S074 to S079

End Date/Time: 6/24/2013 1040

Test Day	Salinity (ppt)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0	30.5	15.8	7.9	8.13	CL	
1	30.5	14.9	8.4	8.02	AD	
2	30.8	15.2	8.1	8.14	SD	
3	30.6	15.1	7.6	8.09	LN	
4	30.6	14.9	8.6	8.09	CL	
5	30.7	15.1	8.4	8.13	CL	
6	30.7	15.1	8.3	8.08	BG	
7	30.6	15.1	8.0	8.13	ML	
8	30.6	15.1	8.2	8.18	ML	
9	30.7	15.1	8.0	8.19	CL	
10	30.6	15.0	8.4	8.09	BG	

QC Check: BG 7/2/13

Final Review: YS 8/8/13

10-Day Marine Sediment Bioassay
Static Conditions

Water Quality Measurements

Client: AMEC/POLA

Test Species: *E. estuarius*

Site ID: Berths 163-164 Comp A

Start Date/Time: 6/14/2013 1445

Test No.: 1306-S074

End Date/Time: 6/24/2013 1040

Test Day	Salinity (ppt)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0	30.5	16.0	7.6	8.20	CL	
1	30.4	15.3	8.2	7.98	AD	
2	30.6	15.4	7.9	8.07	SD	
3	30.8	15.3	7.1	8.05	LN	organisms swimming in water column
4	30.8	15.2	8.3	8.04	CL	
5	30.8	15.3	8.2	8.06	CL	
6	30.6	15.3	8.0	8.02	BG	
7	~~29.8~~ ML 30.8	15.3	ML ~~8~~ 7.6	8.06	ML	1 organism on water surface (alive)
8	30.6	15.3	7.9	8.12	ML	1 swimming in water column
9	30.7	15.2	7.6	8.12	CL	
10	30.3	15.2	8.0	8.00	BG	

QC Check: BG 7/2/13

Final Review: AC 8/20/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.

10-Day Marine Sediment Bioassay
Static Conditions

Water Quality Measurements

Client: AMEC/POLA

Test Species: *E. estuarius*

Site ID: Berths 163-164 Comp B

Start Date/Time: 6/14/2013 1445

Test No.: 1306-8075

End Date/Time: 6/24/2013 1040

Test Day	Salinity (ppt)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (units)	Technician Initials	Comments
0	30.4	15.9	7.5	8.21	CL	
1	30.5	15.4	8.1	8.03	AD	
2	30.5	15.6	8.0	8.12	SD	
3	30.9	15.5	7.4	8.12	LN	
4	30.9	15.3	8.4	8.12	CL	1 organism in water column
5	31.0	15.4	8.2	8.16	CL	
6	30.8	15.4	8.0	8.12	BG	
7	ML ~~30.7~~ 31.0	15.4	7.8	8.15	ML	1 swimming in water column
8	30.6	15.4	7.8	8.19	ML	1 emerged, 1 on water surface
9	30.9	15.4	7.7	8.19	CL	1 emerged
10	30.5	15.3	8.0	8.12	BG	

QC Check: BG 7/2/13

Final Review: AC 8/29/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.

Total Ammonia Analysis
Marine

Pore Water

Client: AMEC/POLA
Project: Berths 163-164
Test Type: Amphipod 10-d survival

DI Blank: 0.0 / 0.0 **Test Start Date:** 6/14/13 **Analyst:** AC / BG
SW Blank: 0.0 / 0.0 **Analysis Date:** 6/11/13 / 6/27/13

Sample ID	Nautilus ID	Sub-Sample Date	Test Day	pH (units)	Salinity (ppt)	NH3-N (mg/L)	Ammonia (mg/L) N x 1.22
Blank Spike (10 mg/L NH_3)		NA	NA	NA	NA	8.1	9.9
Berths 163-164 Comp A		6/10/13	Pre-test*	nm	nm	23.2	28.3
Berths 163-164 Comp B		6/10/13	Pre-test			28.3	34.5
REF		6/10/13	Pre-test			3.6	4.4
QC		6/10/13	Pre-test			8.1	9.9
QC dup		6/10/13	Pre-test			7.9	9.6
QC Spike		6/10/13	Pre-test			16.2	19.8
~~Blank Spike~~ #2							
8,6 ~~Spike Check~~ (10 mg/L NH_3)		NA	NA	NA	NA	7.7	9.4
Lab Control (Eah Home)	1	6/14/13	0	7.60	28.6	0.0	<0.5
Lab Control (Sail Bay)	2	6/14/13	0	7.72	30.7	2.1	2.6
REF	3	6/14/13	0	7.68	26.7	3.4	4.1 ~~4.2~~ BG
Berths 163-164 Comp A	4	6/14/13	0	8.18	30.8	15.0	18.3
Berths 163-164 Comp B	5	6/14/13	0	8.04	29.7	18.5	22.6
Sample Duplicate[a]	2	NA	NA	NA	NA	2.0	2.4
Sample Duplicate + Spike[a]		NA	NA	NA	NA	9.2	11.2
Spike Check (10 mg/L NH_3)		NA	NA	NA	NA	7.7	9.4

Relative Percent Difference (RPD) = [sample] (mg/L) - [sample duplicate] (mg/L) / [average ammonia] (mg/L) x 100 **Acceptable Range: 0-20%**

Percent Recovery = [spiked sample] (mg/L) - [sample] (mg/L) / nominal [spike] (mg/L) x 100 **Acceptable Range: 80-120%[b]**

QC Sample ID	[NH_3]	[Sample Dup]	Measured [Spike]	Nominal [Spike]	RPD	% Recovery
Blank #2	0.0	NA	9.4	10	NA	94
Lab Control (Sail Bay) #2	2.6	2.4	11.2	10	8	86

Comments: *Pre-test is total NH_3 measured at sample check-in, Day 0 is actual pw ammonia at initiation.

Notes: [a] Unless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

[b] Acceptable range for % recovery applies only to the blank spike. Spike recoveries in samples may vary based on sample matrix and are for information only.

[c] RPD calculation not performed due to one or more values below the method detection limit.

Method Detection Limit (MDL) = 0.5 mg/L . nm = not measured

QC Check: BG 7/2/13 **Final Review:** AC 8/20/13

Total Ammonia Analysis
Marine

Overlying Water

Client: AMEC/POLA
Project: Berths 163-164
Test Type: Amphipod 10-d survival

DI Blank: 0.0
SW Blank: 0.0

Test Start Date: 6/14/2013

Analyst: BG
Analysis Date: 6/27/13

Sample ID	Nautilus ID	Sub-Sample Date	Test Day	NH3-N (mg/L)	N x 1.22 Ammonia (mg/L)
Blank Spike (10 mg/L NH_3)		NA	NA	7.1	8.7
Lab Control (Eoh Home)	8	6/14/2013	0	0.0	<0.5
Lab Control (Sail Bay)	9	6/14/2013	0	0.1	<0.5
LA2- Reference	10	6/14/2013	0	0.4	<0.5
Berths 163-164 Comp A	11	6/14/2013	0	1.9	2.3
Berths 163-164 Comp B	12	6/14/2013	0	2.7	3.3
Spike Check (10 mg/L NH_3)		NA	NA	7.1	8.7
Lab Control (Eoh Home)	15	6/24/2013	10	0.0	<0.5
Lab Control (Sail Bay)	16	6/24/2013	10	0.0	<0.5
LA2- Reference	17	6/24/2013	10	1.2	1.5
Berths 163-164 Comp A	18	6/24/2013	10	4.8	BG ~~5.6~~ 5.9
Berths 163-164 Comp B	19	6/24/2013	10	6.5	7.9
Sample Duplicate[a]	9	NA	NA	0.2	<0.5
Sample Duplicate + Spike[a]		NA	NA	7.4	9.0
Spike Check (10 mg/L NH_3)		NA	NA	7.1	8.7

Relative Percent Difference (RPD) = [sample] (mg/L) - [sample duplicate] (mg/L) / [average ammonia] (mg/L) x 100 — **Acceptable Range: 0-20%**

Percent Recovery = [spiked sample] (mg/L) - [sample] (mg/L) / nominal [spike] (mg/L) x 100 — **Acceptable Range: 80-120%[b]**

QC Sample ID	[NH_3]	[Sample Dup]	Measured [Spike]	Nominal [Spike]	RPD	% Recovery
Blank	0.0	NA	8.7	10	NA	87
Lab Control Sail Bay #9	<0.5	<0.5	9.0	10	(c) →	→

Comments:

Notes: [a] Unless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

[b] Acceptable range for % recovery applies only to the blank spike. Spike recoveries in samples may vary based on sample matrix and are for information only.

[c] RPD calculation not performed due to one or both values below the method detection limit.

Method Detection Limit (MDL) = 0.5 mg/L

QC Check: BG 7/2/13

Final Review: AC 8/20/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.

Unionized Ammonia Calculation

Client:	AMEC/POLA
Test Type:	E. estuarius 10-d survival
Test ID:	1306-S074 ,075
Test Date:	6/14/2013

Sample ID	Test Day	Sample Type	Actual Total Ammonia (mg/L)	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	I Rounded	pK	Unionized Ammonia (mg/L)
Lab Control	0	PW	<0.5	16	28.6	7.60	289.16	6.3679	6	9.32	<0.005
FGS Control	0	PW	2.6	16	30.7	7.72	289.16	6.81248	7	9.33	0.033
LA-2 REF	0	PW	4.1	16	26.7	7.68	289.16	5.96732	6	9.32	0.048
B163-164 Comp A	0	PW	18.3	16	30.8	8.18	289.16	6.8337	7	9.33	0.646
B163-164 Comp B	0	PW	22.6	16	29.7	8.04	289.16	6.60053	7	9.33	0.584
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000
							273.16	0.5	1	9.26	0.000

Entry: AC 8/20/13
Q/C: KAP 8/26/13

Unionized Ammonia Calculation

Client:	AMEC/POLA
Test Type:	E. estuarius 10-d survival
Test ID:	1306-S074, S075
Test Date:	6/14/2013

Sample ID	Test Day	Sample Type	Actual Total Ammonia (mg/L)	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	I Rounded	pK	**Unionized Ammonia (mg/L)**
Lab Control	0	OW	<0.5	15.9	30.1	8.11	289.06	6.68526	7	9.33	<0.015
FGS Control	0	OW	<0.5	15.8	30.5	8.09	288.96	6.77006	7	9.33	<0.014
LA-2 REF	0	OW	<0.5	15.8	30.5	8.13	288.96	6.77006	7	9.33	< 0.016
B163-164 Comp A	0	OW	2.3	16.0	30.5	8.20	289.16	6.77006	7	9.33	0.085
B163-164 Comp B	0	OW	3.3	15.9	30.4	8.21	289.06	6.74885	7	9.33	0.124
Lab Control	10	OW	< 0.5	14.7	30.1	7.99	287.86	6.68526	7	9.33	< 0.010
FGS Control	10	OW	< 0.5	14.4	30.6	8.18	287.56	6.79127	7	9.33	<0.016
LA-2 REF	10	OW	1.5	15.0	30.6	8.09	288.16	6.79127	7	9.33	0.040
B163-164 Comp A	10	OW	5.9	15.2	30.3	8.00	288.36	6.72765	7	9.33	0.131
B163-164 Comp B	10	OW	7.9	15.3	30.5	8.12	288.46	6.77006	7	9.33	0.232

Entry: AC 8/20/13
Q/C: MP 8/26/13

Appendix C

Chain of Custody Documentation

Nautilus Environmental

4340 Vandever Ave.
San Diego, CA 92120
Phone 858.587.7333
Fax 858.587.3961

Chain of Custody

Date 06/11/2013 Page 1 of 1

Sample Collection By:

Report to:

Company	AMEC Environment & Infrastructure
Address	9210 Sky Park Ct. Ste 200
City/State/Zip	San Diego, CA 92123
Contact	Barry Snyder/Tyler Huff
Phone	(858) 300-4300
Email	barry.snyder@amec.com and

Invoice To:

Company	Same as "Report to" at left
Address	
City/State/Zip	
Contact	
Phone	
Email	tyler.huff@amec.com

ANALYSES REQUIRED

	SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS	SP	SPP	BP	Receipt Temperature (°C)
1	B163-164 A Comp	6/10/2013	1500	sediment	5 gallon bag	7	Berths 163-164 Sediment Composite	X			4.7°C
2	B163-164 B Comp	6/10/2013	1700	sediment	5 gallon bag	7	Berths 163-164 Sediment Composite	X			4.2°C
3											
4							Please start SP amphipod testing				
5							for EOH, hold remainder of sample				
6							pending chemistry results.				
7											
8											
9											
10											

PROJECT INFORMATION		SAMPLE RECEIPT	
Client:	AMEC/POLA	Total No. of Containers	
PO No.:	1015101930	Received Good Condition?	
Shipped Via:	hand-delivered	Matches Test Schedule?	

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY (CLIENT)	RELINQUISHED BY (COURIER)
(Signature) (Time) 6/11/13 1700	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)

RECEIVED BY (COURIER)	RECEIVED BY (LABORATORY)
(Signature) (Time)	(Signature) Adrienne Cibor (Time) 1700
(Printed Name) (Date)	(Printed Name) Adrienne Cibor (Date) 6/11/13
(Company)	(Company) Nautilus

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.

DISTRIBUTION: WHITE - Nautilus Environmental. COLOR - Originator

13-3098, -3099

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120
Phone 858.587.7333
Fax 858.587.3961

Chain of Custody

Date 6/4/13 Page 1 of 1

Sample Collection By: AMEC Environment & Infrastructure

Report to:
- Company: AMEC E&I
- Address: 9210 Sky Pk Ct Ste 200
- City/State/Zip: San Diego, CA 92123
- Contact: Barry Snyder / Tyler Huff
- Phone: (858) 300 4300
- Email: Barry.Snyder@amec.com

Invoice To:
- Company: SAME
- Address:
- City/State/Zip:
- Contact:
- Phone:
- Email: & Tyler.Huff@amec.com

ANALYSES REQUIRED

	SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS	Sb	Sn	Pb								Receipt Temperature (°C)
1	~~LA 02~~ Reference	6/2/13	1430	sed	bag	4	for use w/ Berths 163-164 & UTI Container Terminal tox & BP tests	X		X								1.1
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

PROJECT INFORMATION

Client:	POLA
PO No.:	10/510/929/30
Shipped Via:	Courier

SAMPLE RECEIPT

Total No. of Containers	4
Received Good Condition?	✓
Matches Test Schedule?	✓

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY (CLIENT)
(Signature) Kimberley Gabbi (Time) 1655
(Printed Name) Kimberley Gabbi (Date) 6/4/13
(Company) AMEC

RECEIVED BY (COURIER)
(Signature) [illegible] (Time) 16:55
(Printed Name) Aaron Hill (Date) 6/4
(Company) Messenger Express

RELINQUISHED BY (COURIER)
(Signature) [illegible] (Time) 19:30
(Printed Name) Aaron Hill (Date) 6/4
(Company) Messenger Express

RECEIVED BY (LABORATORY)
(Signature) Adrienne Cibor (Time) 19:30
(Printed Name) Adrienne Cibor (Date) 6/4/13
(Company) Nautilus

Additional costs maybe required for sample disposal or storage.
Payment Net 30 unless otherwise contracted.

DISTRIBUTION: WHITE - Nautilus Environmental, COLOR - Originator

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120

Sediment Sample Check-In Information

Client: AMEC

Log-In Nos.: 13-3098 - 13-3099

Project: POLA Berths 163-164

Test Type(s): Eoh

Test IDs: 1306-5074 to 5079

Sample ID	Collection Date & Time	Receipt Date & Time	Receipt Temp. (°C)	No. Containers	Container Type	Approx. Total Volume Received (L)	Sample Description	Tech Initials
B163-164 A comp	6/10/13 1500	6/11/13 1700	4.0	5	bag	~100	Sediment	BG
B163-164 B comp	6/10/13 1700	6/11/13 1700	4.0	5	bag	~100	Sediment	BG

Samples Shipped Via: N/A

COC Present? (Y) N

Sieving Required? (Y) N Screen Size: 0.5mm

Lab Control Sediment: Eoh Home Sail Bay (fine grain)

Sub-samples for additional chemistry:

Collect Porewater Tech Initials AC

Other _____ Tech Initials _____

Other _____ Tech Initials _____

Other _____ Tech Initials _____

Test Organism:	Eoh				
Supplier:	NW Aquatics				
Receipt Date:	6/7/13				
Condition:	Good				

Comments:

QC Check: BG 7/2/13

Final Review: KFP 8/26/13

Appendix D
Reference Toxicant Data

CETIS Summary Report

Report Date: 19 Jun-13 10:07 (p 1 of 1)
Test Code: 130614eera | 07-2203-5945

Acute Amphipod Survival Test — Nautilus Environmental (CA)

Batch ID:	01-5191-3962	Test Type:	Survival (96h)	Analyst:	
Start Date:	14 Jun-13 16:05	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Diluted Natural Seawater
Ending Date:	18 Jun-13 14:30	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Duration:	94h	Source:	Northwestern Aquatic Science, OR	~~Age:~~ Size	3-5 mm

Sample ID:	00-0192-5160	Code:	130614eera	Client:	Internal
Sample Date:	14 Jun-13	Material:	Cadmium chloride	Project:	
Receive Date:	14 Jun-13	Source:	Reference Toxicant		
Sample Age:	16h	Station:	Cadmium chloride		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
18-3812-0276	96h Survival Rate	1.25	2.5	1.768	15.1%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
15-9339-8356	96h Survival Rate	EC50	9.612	7.784	11.87		Trimmed Spearman-Kärber

96h Survival Rate Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Control	4	1	1	1	1	1	0	0	0.0%	0.0%
1.25		4	0.9	0.8695	0.9305	0.8	1	0.04082	0.08165	9.07%	10.0%
2.5		4	0.825	0.778	0.872	0.7	1	0.06292	0.1258	15.25%	17.5%
5		4	0.725	0.669	0.781	0.6	0.9	0.075	0.15	20.69%	27.5%
10		4	0.7	0.6695	0.7305	0.6	0.8	0.04082	0.08165	11.66%	30.0%
20		4	0.1	0.05688	0.1431	0	0.2	0.05774	0.1155	115.5%	90.0%

96h Survival Rate Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Control	1	1	1	1
1.25		0.8	1	0.9	0.9
2.5		1	0.8	0.8	0.7
5		0.6	0.6	0.9	0.8
10		0.6	0.8	0.7	0.7
20		0.2	0	0	0.2

CETIS Analytical Report

Acute Amphipod Survival Test — Nautilus Environmental (CA)

Analysis ID:	18-3812-0276	Endpoint:	96h Survival Rate	CETIS Version:	CETISv1.8.4
Analyzed:	19 Jun-13 10:04	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	NA	C > T	NA	NA	1.25	2.5	1.768		15.1%

Dunnett Multiple Comparison Test

Control	vs	C-mg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Control		1.25	1.575	2.407	0.241	6	0.2046	CDF	Non-Significant Effect
		2.5*	2.555	2.407	0.241	6	0.0376	CDF	Significant Effect
		5*	3.796	2.407	0.241	6	0.0029	CDF	Significant Effect
		10*	4.177	2.407	0.241	6	0.0013	CDF	Significant Effect
		20*	11	2.407	0.241	6	<0.0001	CDF	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	2.102	2.802	0.6778	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.920323	0.5840646	5	29.15	<0.0001	Significant Effect
Error	0.3606956	0.02003864	18			
Total	3.281018		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2.089	4.248	0.1141	Equal Variances
Variances	Levene Equality of Variance	3.433	4.248	0.0236	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9184	0.884	0.0537	Normal Distribution

96h Survival Rate Summary

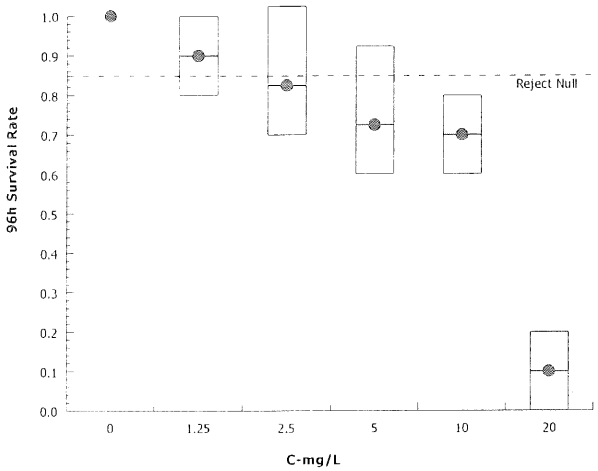
C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Control	4	1	1	1	1	1	1	0	0.0%	0.0%
1.25		4	0.9	0.7701	1	0.9	0.8	1	0.04082	9.07%	10.0%
2.5		4	0.825	0.6248	1	0.8	0.7	1	0.06292	15.25%	17.5%
5		4	0.725	0.4863	0.9637	0.7	0.6	0.9	0.075	20.69%	27.5%
10		4	0.7	0.5701	0.8299	0.7	0.6	0.8	0.04082	11.66%	30.0%
20		4	0.1	0	0.2837	0.1	0	0.2	0.05774	115.5%	90.0%

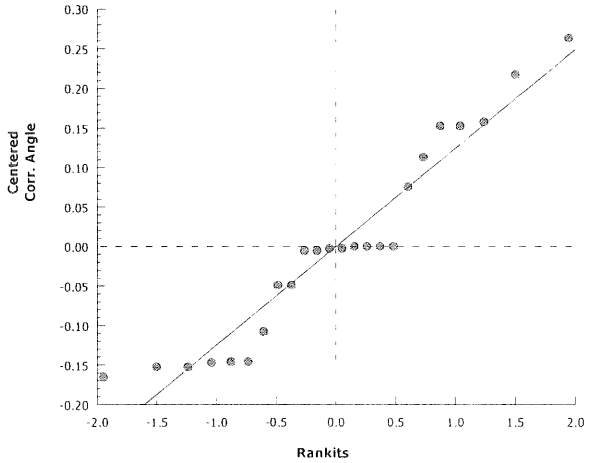
Angular (Corrected) Transformed Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Control	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
1.25		4	1.254	1.056	1.453	1.249	1.107	1.412	0.06231	9.94%	11.17%
2.5		4	1.156	0.8637	1.449	1.107	0.9912	1.419	0.09191	15.9%	18.11%
5		4	1.032	0.7484	1.316	0.9966	0.8861	1.249	0.08914	17.27%	26.91%
10		4	0.9939	0.8502	1.138	0.9912	0.8861	1.107	0.04515	9.09%	29.61%
20		4	0.3112	0.03113	0.5913	0.3112	0.1588	0.4636	0.08801	56.56%	77.96%

Acute Amphipod Survival Test					Nautilus Environmental (CA)
Analysis ID:	18-3812-0276	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	19 Jun-13 10:04	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Report Date: 19 Jun-13 10:07 (p 1 of 1)
Test Code: 130614eera | 07-2203-5945

Acute Amphipod Survival Test — **Nautilus Environmental (CA)**

Analysis ID:	15-9339-8356	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	19 Jun-13 10:05	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0	10.00%	0.9828	0.0458	9.612	7.784	11.87

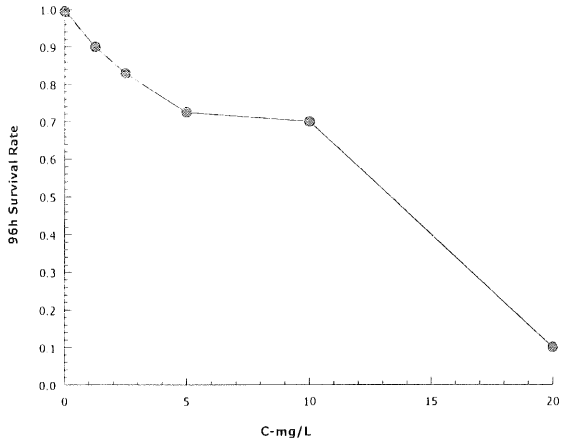
Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	2.102	2.802	0.6778	No Outliers Detected

96h Survival Rate Summary

			Calculated Variate(A/B)								
C-mg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Lab Control	4	1	1	1	0	0	0.0%	0.0%	40	40
1.25		4	0.9	0.8	1	0.04082	0.08165	9.07%	10.0%	36	40
2.5		4	0.825	0.7	1	0.06292	0.1258	15.25%	17.5%	34	41
5		4	0.725	0.6	0.9	0.075	0.15	20.69%	27.5%	29	40
10		4	0.7	0.6	0.8	0.04082	0.08165	11.66%	30.0%	28	40
20		4	0.1	0	0.2	0.05774	0.1155	115.5%	90.0%	4	40

Graphics

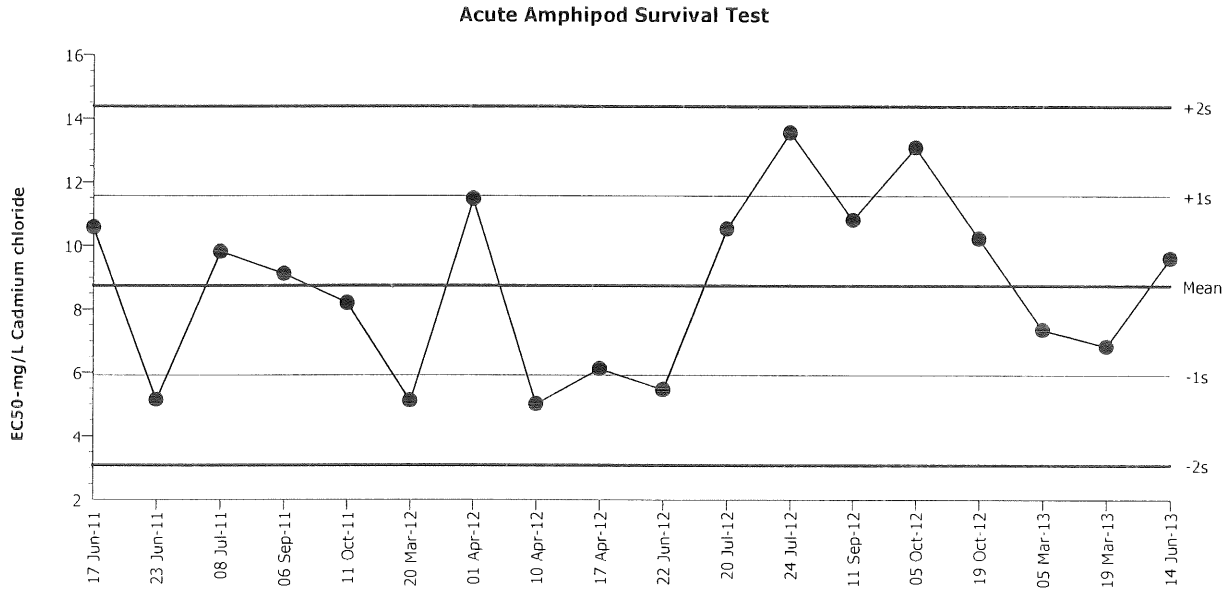


CETIS QC Plot

Report Date: 19 Jun-13 10:12 (1 of 1)

Acute Amphipod Survival Test — Nautilus Environmental (CA)

Test Type:	Survival (96h)	**Organism:**	Eohaustorius estuarius (Amphipod)	**Material:**	Cadmium chloride
Protocol:	EPA/600/R-94/025 (1994)	**Endpoint:**	96h Survival Rate	**Source:**	Reference Toxicant-REF



Mean:	8.738	**Count:**	17	**-1s Warning Limit:**	5.916	**-2s Action Limit:**	3.094
Sigma:	2.822	**CV:**	32.30%	**+1s Warning Limit:**	11.56	**+2s Action Limit:**	14.38

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Jun	17	10.58	1.844	0.6535			04-7355-3643	07-6874-3745
2			23	5.151	-3.587	-1.271	(-)		13-2405-8190	14-5588-5921
3		Jul	8	9.819	1.081	0.3831			15-6016-6275	08-2935-4591
4		Sep	6	9.123	0.3854	0.1366			19-8263-9958	15-3049-8972
5		Oct	11	8.208	-0.53	-0.1878			04-5683-5278	08-5229-4738
6	2012	Mar	20	5.125	-3.613	-1.28	(-)		08-7199-6871	10-8279-6045
7		Apr	1	11.49	2.749	0.9741			16-6898-4384	19-8941-9944
8			10	5.017	-3.721	-1.319	(-)		17-6920-6681	20-9566-8272
9			17	6.123	-2.615	-0.9268			09-5184-8036	12-7137-1039
10		Jun	22	5.471	-3.267	-1.158	(-)		07-6049-5353	11-0995-0121
11		Jul	20	10.54	1.804	0.6392			16-2846-0234	13-2124-5320
12			24	13.56	4.822	1.709	(+)		13-0734-2251	08-2819-6469
13		Sep	11	10.82	2.083	0.738			04-2672-2264	19-7399-3537
14		Oct	5	13.09	4.356	1.544	(+)		11-0626-8499	15-2615-3111
15			19	10.24	1.5	0.5315			20-1096-6081	15-0965-7000
16	2013	Mar	5	7.357	-1.381	-0.4895			15-1987-8538	07-6132-5027
17			19	6.83	-1.908	-0.676			15-7965-1544	07-5996-2822
18		Jun	14	9.612	0.8735	0.3095			07-2203-5945	15-9339-8356

Analyst: BG QA: KFP 6/14/13

96-hour Marine Acute Bioassay
Static Conditions

Water Quality Measurements
& Test Organism Survival

Client: Internal
Sample ID: $CdCl_2$
Test No.: 130614eera

Test Species: *E. estuarius*
Start Date/Time: 6/14/2013 1605
End Date/Time: 6/18/2013 1430

	Tech Initials				
	0	24	48	72	96
Counts:	ML				CL
Readings:	CL	AD	SO	LN	CL
Dilutions made by:	CL				
High conc. made (mL):	20				
Vol. Cd stock added (mL):	76.9				
Final Volume (mL):	4000				

Cd stock concentration (mg/L): 1040

Concentration mg/L	RAND #	Number of Live Organisms		Salinity (ppt)					Temperature (°C)					Dissolved Oxygen (mg/L)					pH (units)				
		0	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Lab Control	10	10	10	30.0	~~28.5~~ AD	30.3	30.4	30.2	14.8	14.2	14.2	14.2	13.9	8.6	8.2	7.9	7.6	8.7	8.14	8.02	7.96	7.92	7.93
	5	10	10		30.0																		
	6	10	10																				
	11	10	10																				
1.25	22	10	8	30.2	~~28.6~~ AD	30.4	30.2	30.6	14.5	14.1	14.0	14.0	13.9	8.6	8.3	7.9	7.5	8.4	8.15	8.03	7.96	7.94	7.92
	2	10	10		30.1																		
	24	10	9																				
	19	10	9																				
2.5	4	~~10~~ 11	11	30.2	~~28.5~~	30.3	30.5	30.5	14.6	14.1	14.0	14.0	13.8	8.6	8.2	7.9	7.7	8.5	8.16	8.02	7.97	7.96	7.96
	1	10	8		30.0																		
	21	10	8																				
	23	10	7																				
5.0	20	10	6	30.1	~~28.4~~ AD	30.1	30.2	30.3	14.5	14.1	14.0	14.1	13.8	8.6	8.1	7.8	7.5	8.5	8.18	8.02	7.97	7.96	7.95
	18	10	6		29.9																		
	3	10	9																				
	14	10	8																				
10	17	10	6	30.0	~~28.9~~ AD	30.1	30.2	30.2	14.6	14.2	14.1	14.1	13.9	8.6	8.2	8.0	7.5	8.3	8.17	8.02	7.97	7.98	7.92
	12	10	8		29.8																		
	8	10	7																				
	9	10	7																				
20	15	10	2	29.6	~~28.1~~ AD	29.8	29.7	29.9	14.6	14.0	14.0	14.0	13.6	8.6	8.4	8.2	7.7	8.6	8.17	8.03	8.01	7.98	7.96
	16	10	0		29.6																		
	13	10	0																				
	7	10	2																				

Initial Counts QC'd by: KS

Animal Source/Date Received: Northwestern Aquatic Sciences 6/7/13

Size at Initiation: 3-5mm

Comments:

QC Check: 6/19/13 BG

Final Review: VPP 6/14/13

Nautilus Environmental. 4340 Vandever Avenue. San Diego, CA 92120.